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Studies in Territorial and Cultural Diversity Governance

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Climate Change Integration in the Multilevel Governance of Italy and Austria

*Shaping Subnational Policies in the Transport,
Energy, and Spatial Planning Sectors*

Edited by

Federica Cittadino, Louisa Parks,
Peter Bußjäger and Francesca Rosignoli



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Acronyms, Abbreviations and Symbols

APPA Bolzano	<i>Agenzia provinciale per l'Ambiente e la tutela del Clima</i> – Provincial Agency for the Protection of the Environment and Climate (Province of Bolzano, Italy)
APPA Trento	<i>Agenzia Provinciale per la protezione dell'ambiente</i> – Provincial Agency for the Protection of the Environment (Province of Trento, Italy)
Art./arts.	Article/articles
ASTAT	<i>Istituto provinciale di statistica</i> – Provincial Institute for Statistics (Province of Bolzano, Italy)
BBT	Brenner Base Tunnel
BGBI	<i>Bundesgesetzblatt</i> – official journal (Austria)
BMK	<i>Bundesministerium für Klimaschutz, Umwelt, Energie, Mobilität, Innovation und Technologie</i> – National Ministry for Climate Action, Environment, Energy, Mobility, Innovation and Technology (Austria)
B-VG	<i>Bundes-Verfassungsgesetz</i> – Federal Constitutional Law (Austria)
CITE	<i>Comitato interministeriale per la transizione ecologica</i> – Interministerial Committee for Ecological Transition (Italy)
CJEU	Court of Justice of the European Union
CO ₂	Carbon dioxide
CO ₂ e	CO ₂ equivalent
COP	Conference of the Parties
Corte cost.	<i>Corte Costituzionale</i> – Constitutional Court (Italy)
CPI	Climate change policy integration
CPT database	<i>Conti Pubblici Territoriali</i> – Public Territorial Accounts database (Province of Trento, Italy)
CSOS	Civil Society Organizations
CTCS	Covenant Territorial Coordinators
CVD	Clean Vehicles Directive or Directive 2009/33/EC on the promotion of clean road transport vehicles in support of low-emission mobility
DAFI Directive	Directive 2014/94/EU on the deployment of alternative fuels infrastructure
DEFP	<i>Documento di Economia e Finanza Provinciale</i> – Provincial Economic and Financial Document (Province of Trento, Italy)
D.G.P.	<i>Deliberazione della Giunta Provinciale</i> – Provincial Government Act (Italy)
D.lgs.	<i>Decreto legislativo</i> – Legislative Decree (Italy)
D.L.	<i>Decreto legge</i> – Decree Law (Italy)
D.M. or DM	<i>Decreto ministeriale</i> – Ministerial Decree (Italy)

D.P.C.M. or DPCM	<i>Decreto del Presidente del Consiglio dei Ministri</i> – Decree by the Prime Minister (Italy)
D.P.P. or DPP	<i>Decreto del Presidente della Provincia</i> – Decree by the President of the Province (Italy)
D.P.R. or DPR	<i>Decreto del Presidente della Repubblica</i> – Decree by the President of the Republic (Italy)
ECHR	European Convention on Human Rights
ECtHR	European Court of Human Rights
EEA	European Environment Agency
EGTC	European Grouping of Territorial Cooperation
EIA	Environmental Impact Assessment
EPI	Environmental policy integration
ERDF	European Regional Development Fund
ES	Effort Sharing
ETS	Emission Trading System
EU	European Union
FAG	<i>Finanzausgleichgesetz</i> – Financial Equalization Act (Austria)
FFF	Fridays for Future
F-VG	<i>Finanz-Verfassungsgesetz</i> – Finance Constitution Act (Austria)
GHG	Greenhouse Gas
IntBZ	Interview conducted in the Province of Bolzano
IntTN	Interview conducted in the Province of Trento
IntT	Interview conducted in Tyrol
IntV	Interview conducted in Vorarlberg
IPCC	Intergovernmental Panel on Climate Change
ISPRA	<i>Istituto Superiore per la Protezione e la Ricerca Ambientale</i> – Institute for Environmental Protection and Research (Italy)
KSG	<i>Klimaschutzgesetz</i> – Climate Protection Law (Austria)
L.	<i>Legge</i> – law (Italy)
LEROP	<i>Piano provinciale di sviluppo e coordinamento territoriale</i> – Provincial Plan for Territorial Development and Coordination (Province of Bolzano, Italy)
L.P.	<i>Legge provinciale</i> – provincial law (Italy)
L-UIG	<i>Landes-Umweltinformationsgesetz</i> – <i>Land</i> Environmental Information Act (Vorarlberg, Austria)
LULUCF	Land Use, Land Use Change and Forestry
L-VG	<i>Landesverfassungsgesetz</i> – <i>Land</i> Statute/Constitution (Austria)
NADEPF	<i>Nota di Aggiornamento al DEFP (supra)</i> – Update Note to DEFP (<i>supra</i>)
NAP	National Adaptation Plans

NAS	National Adaptation Strategies
NDC	Nationally Determined Contributions
NGOS	Non-Governmental Organizations
OJ	Official Journal
ÖBB	<i>Österreichische Bundesbahnen</i> – Austrian Federal Railways (Austria)
ÖPNRV-G	<i>Öffentliches Personennah- und –Regionalsverkehrs-Gesetz</i> – Law on planning and financing public means of transport (Austria)
ÖROK	<i>Österreichische Raumordnungskonferenz</i> – Austrian Conference on Spatial Planning (Austria)
ÖVP	<i>Österreichische Volkspartei</i> – Austrian Popular Party (Austria)
Para./paras.	Paragraph/paragraphs
PEAP	<i>Piano energetico ambientale provinciale</i> – Integrated Provincial Energy and Environmental Plan (Province of Trento, Italy)
PGUAP	<i>Piano Generale di Utilizzazione delle Acque Pubbliche</i> – General Plan for the Utilization of Public Water (Province of Bolzano, Italy)
PNIEC	<i>Piano nazionale integrato per l'energia e il clima</i> – Integrated National Energy and Climate Plan (Italy)
PNRR	<i>Piano nazionale di ripresa e resilienza</i> – National Recovery and Resilience Plan (Italy)
pPTE	<i>Proposta di piano per la transizione ecologica</i> – Draft Plan on Ecological Transition (Italy)
PRG	<i>Piano regolatore generale</i> – Land Use Plan (Province of Trento, Italy)
PTC	<i>Piano territoriale della comunità</i> – Community Territorial Plan (Province of Trento, Italy)
PUP	<i>Piano urbanistico provinciale</i> – Provincial Urban Plan (Province of Trento, Italy)
QDA	Qualitative Document Analysis
RES	Renewable Energy Sources
SDGs	Sustainable Development Goals
SEA	Strategic Environmental Assessment
SproSS	<i>Strategia provinciale di Sviluppo Sostenibile</i> – Provincial Strategy on Sustainable Development (Province of Trento, Italy)
StVO	<i>Straßenverkehrsordnung</i> – Road Traffic Regulation (Austria)
SVP	<i>Südtiroler Volkspartei</i> – South Tyrol Popular Party (Province of Bolzano, Italy)
TROG	<i>Tiroler Raumordnungsgesetz</i> – Land Use Law of Tyrol (Austria)
TUIG	<i>Tiroler Umweltinformationsgesetz</i> – Environmental Information Act of Tyrol (Austria)
UIG	<i>Umweltinformationsgesetz</i> – Environmental Information Act (Austria)
UNECE	United Nations Economic Commission for Europe

UNFCCC	United Nations Framework Convention on Climate Change
VAS	<i>Valutazione Ambientale Strategica</i> – Strategic Environmental Assessment (Italy)
VfGH	<i>Verfassungsgerichtshof</i> – Constitutional Court (Austria)
VfSlg	<i>Ausgewählte Entscheidungen</i> – Selected judgments (Austria)
VIA	<i>Valutazione di Impatto Ambientale</i> – Environmental Impact Assessment (Italy)
VVV	<i>Vorarlberger Verkehrsverbund</i> – Vorarlberg Transport Association (Vorarlberg, Austria)
WRG	<i>Wasserrechtsgesetz</i> – Water Law (Austria)
§	Paragraph/section

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Introduction

Climate Change Integration in the Multilevel Governance of Italy and Austria

Louisa Parks and Niccolò Bertuzzi

This book discusses a crucial issue for subnational governments: how to integrate climate change considerations across policy areas to contribute to our global responses to the challenges it presents?¹ This question is not easy to answer. Climate change is ‘the epitome of a multilevel governance challenge’;² the subject of a regime complex that involves countries across the globe and a history of fraught multilateral diplomacy.³ In European Union (EU) Member States like Italy and Austria, it is also an area of shared competence, precisely because an integrated approach to climate change is key to progress in coping with irreversible change and preventing further degradation. The context in which subnational policies should account for climate change is thus both complex and extremely important. The impacts of climate change are often felt most immediately by citizens at subnational or local levels, and subnational policies must respond to this, since authorities at this level hold powers in many sectors either impacted by climate change or where policies have direct effects on mitigation and adaptation goals.⁴

The following chapters make a novel contribution to the study of subnational-level climate change policy integration (CPI). They are all based on cross-national research between Italy and Austria, comparing the Italian Autonomous Provinces of Trento and Bolzano and the Austrian *Länder* Tyrol and Vorarlberg.⁵ These are governed by authorities with varying powers and institutional set-ups,⁶ which allows reflections about how to guarantee climate

1 In the joint elaboration of this chapter, section 1 has been written by Louisa Parks, section 2 by Niccolò Bertuzzi, and section 3 by both.

2 D. Brown, “Cooperative Versus Competitive Federalism: Outcomes and Consequences of Intergovernmental Relations on Climate Change Issues in Canada”, *Zeitschrift für Kanada – Studien*, 32 (2012) 9–27, at 17.

3 R.O. Keohane and D.G. Victor, “The Regime Complex for Climate Change”, *Perspectives on Politics*, 9 (2011) 7–23.

4 *Ibid.*, at 12; I. Galarraga, M. Gonzalez-Eguino and A. Markandya, “The Role of Regional Governments in Climate Change Policy”, *Environmental Policy and Governance*, 21 (2011) 164–182.

5 Research project “Climate Change Integration in the Multilevel Governance of Italy and Austria: Policy-Making and Implementation in Selected Subnational Policies” funded by the Autonomous Province of Bolzano program Research *Südtirol/Alto Adige* 2019.

6 See also Chapter 2 and Chapter 3 in this volume.

change integration within different types of settings to emerge and inform debates on other policy areas and subnational governments alike.⁷ This focus is also linked to the particular vulnerability of this Alpine area to the impacts of climate change, and the closeness of the areas, which means problems are shared across national borders. How can different subnational governments achieve a coordinated approach to climate change in their policies despite their different political, legal and institutional contexts? The chapters answer this question in detailed ways. They focus on policy sectors particularly pertinent to climate change (transport, energy and water, and spatial planning) in cross-regional discussions. They then discuss dimensions hypothesized to shape CPI (coordination, participation, information, leadership, and funding) in cross-sectoral and cross-national perspectives. The perspective taken in this volume is thus an institutional one, with the focus on how subnational governmental institutions' organizational qualities play a role in shaping CPI.⁸ The findings show what shapes effective CPI, in what policy sector, and under what circumstances, thus rendering the findings testable and informative for other subnational contexts.

In this Introduction, we next summarize the theoretical and empirical premises of the research. First, we briefly lay out the foundations on which the empirical chapters build by describing concepts and literature relevant to a study of climate governance at the subnational level, including CPI. We then outline the reasoning behind the research design in this comparative study, as well as the research framework. In particular we describe the dimensions hypothesized to shape CPI, the methodology, then reflect on how the findings from this research can apply elsewhere. We conclude with a preview of the chapters in the book.

1 Studying Climate Change Integration at the Subnational Level

Climate change is a global problem, but its effects are not uniformly distributed and different repercussions are seen at local scales.⁹ Some international

7 Subnational governments are defined in this book as those intermediate entities that form part of a federal/regional State, can exercise a number of legislative/administrative powers on selected sectors/policies, and have their own political institutions. See T. Hueglin and A. Fenna, *Comparative Federalism: A Systematic Inquiry* (University of Toronto Press 2015), at 16ff.

8 See, for example, W.W. Powell and P.J. DiMaggio (eds.), *The New Institutionalism in Organizational Analysis* (University of Chicago Press 1991).

9 W.N. Adger *et al.*, "Adapting to Climate Change: Perspectives Across Scales", *Global Environmental Change*, 15 (2005) 75–76; P. Adri  zola *et al.*, *Multi-level Climate Governance Supporting Local Action* (GIZ 2018).

actors correctly highlight the crucial role of subnational governments in reducing emissions, yet their role in integrating climate-related objectives and measures in sectoral policies has not received a great deal of scholarly attention, also because work on climate change mitigation has mainly been considered a matter of transnational (or at least national) scope.¹⁰ Though adaptation is now emerging as key in discussions of climate change policy and scholars and analysts alike agree that here the subnational level is key, the main focus in this book is on climate change mitigation measures. All climate change-related policies require tailoring to local settings. They must be calibrated to specific economic, environmental, and social contexts if they are to be effective:¹¹ a need reflected at the international level in the Paris Agreement and its shift from a regulatory approach towards a more polycentric model of governance,¹² where sub-state (and non-state) actors assume a pivotal role alongside national and transnational actors.¹³ Nationally Determined Contributions (NDC), country-level targets for lowering emissions developed by Parties on a voluntary basis, rely in many cases on subnational actions (as do adaptation policies).¹⁴ This “glocal” turn in climate governance echoes a long-term process of

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- 10 C. Adelle and D. Russel, “Climate Policy Integration: A Case of Déjà Vu?”, *Environmental Policy and Governance*, 23 (2013) 1–12; R. Steurer and C. Clar, “The Ambiguity of Federalism in Climate Policy-Making: How the Political System in Austria Hinders Mitigation and Facilitates Adaptation”, *Journal of Environmental Policy and Planning*, 20 (2018) 252–265; B. Mayer, *The International Law on Climate Change* (Cambridge University Press 2018); H. Amundsen, F. Berglund and H. Westskog, “Overcoming Barriers to Climate Change Adaptation—A Question of Multilevel Governance?”, *Environment and Planning C: Government and Policy*, 28 (2010) 276–289; S. Chan *et al.*, “Promises and Risks of Nonstate Action in Climate and Sustainability Governance”, *Climate Change*, 10 (2019) 1–8.
- 11 M.F. Byskov *et al.*, “An Agenda for Ethics and Justice in Adaptation to Climate Change”, *Climate and Development*, 13 (2021) 1–9.
- 12 S.C. Aykut, “Taking a Wider View on Climate Governance: Moving Beyond the ‘Iceberg’, the ‘Elephant’, and the ‘Forest’”, *Climate Change*, 7 (2016) 318–328; K.W. Abbott, “Strategic Ordering in Polycentric Governance”, in A. Jordan *et al.* (eds.), *Governing Climate Change: Polycentricity in Action?*, (Cambridge University Press 2018) 188–209; T. Hale, “‘All Hands on Deck’: The Paris Agreement and Nonstate Climate Action”, *Global Environmental Politics*, 16 (2016) 12–22.
- 13 *Ibid.* footnote 12; T. Hale, “The Role of Sub-State and Non-State Actors in International Climate Processes”, *Chatham House Research Paper*, (2018), available online at <https://www.chathamhouse.org/sites/default/files/publications/research/2018-11-28-non-state-sectors-climate-synthesis-hale-final.pdf>; F. Biermann and P. H. Pattberg (eds.), *Global Environmental Governance Reconsidered* (MIT Press 2012). All internet sources in this Chapter were accessed on 12 July 2022.
- 14 S.C. Aykut, E. Morena and J. Foyer, “‘Incantatory’ Governance: Global Climate Politics’ Performative Turn and its Wider Significance for Global Politics”, *International Politics*, 58 (2021) 519–540.

decentralization in the UN climate regime.¹⁵ As goals of effective top-down climate governance have been progressively deemed unrealistic, a turn towards bottom-up approaches has been noted within the UN climate regime.¹⁶ Whether these shifts are positive for effective climate change policy is debated. While some scholars see opportunities,¹⁷ others warn of the dangers of further fragmentation, uncertainty, ambiguity and accompanying coordination challenges that may produce “anarchic inefficiency”.¹⁸ In both scenarios, which are more complex than we have space to do justice to here, the importance of a focus on the subnational level and evidence of how CPI unfolds is nevertheless evident. The subnational level emerges as key to both effective implementation and as a source of new transnational visions for the future of climate governance.¹⁹

1.1 *Environmental and Climate Policy Integration in Local Contexts*

The basic concept underpinning the research in this volume is environmental policy integration (EPI), an established field of study that focuses on the need to mainstream or integrate environmental concerns across policy sectors.²⁰

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- 15 J. Peel, L. Godden and R.J. Keenan, “Climate Change Law in an Era of Multi-Level Governance”, *Transnational Environmental Law*, 1 (2012) 245–280.
- 16 S.C. Aykut, “Taking a Wider View on Climate Governance”, *supra*.
- 17 E. Ostrom, “A Polycentric Approach for Coping With Climate Change”, *World Bank Policy Research Working Paper*, 5095 (2009); R. O. Keohane and D.G. Victor, “The Regime Complex for Climate Change”, *supra*; A. Underdal, “Complexity and Challenges of Long-Term Environmental Governance”, *Global Environmental Change*, 20 (2010) 386–393; A. Jordan, D. Huitema, H. Van Asselt and J. Forster (eds.), *Governing Climate Change: Polycentricity in Action?* (Cambridge University Press 2018).
- 18 D. Held and A. Hervey, “Democracy, Climate Change and Global Governance: Democratic Agency and the Policy Menu Ahead”, in D. Held, A. Fane-Hervey and M. Theros (eds.), *The Governance of Climate Change* (Cambridge Polity Press 2011) 89–110 at 97; A.E. Jochim and P.J. May, “Beyond Subsystems: Policy Regimes and Governance”, *Policy Studies Journal*, 38 (2010) 303–327; J.J. Candel and R. Biesbroek, “Toward a Processual Understanding of Policy Integration”, *Policy Sciences*, 49 (2016) 211–231; T. Hustedt and T. Danken, “Institutional Logics in Inter-Departmental Coordination: Why Actors Agree on a Joint Policy Output”, *Public Administration*, 95 (2017) 730–743; R. Steurer and C. Clar, “The Ambiguity of Federalism in Climate Policy-Making”, *supra*.
- 19 A. Hsu, A.J. Weinfurter and K. Xu, “Aligning Subnational Climate Actions for the New Post-Paris Climate Regime”, *Climatic Change*, 142 (2017) 419–432; S. Bernstein and M. Hoffmann, “The Politics of Decarbonization and the Catalytic Impact of Subnational Climate Experiments”, *Policy Sciences*, 51 (2018) 189–211; K.H. Engel and B.Y. Orbach, “Micro-Motives and State and Local Climate Change Initiatives”, *Harvard Law and Policy Review*, 2 (2008) 119–137.
- 20 For a recent literature review on EPI, see for example C. Dupont and A. Jordan, “Policy Integration”, in A. Jordan and V. Gravey (eds.), *Environmental Policy in the EU* (Routledge 2021) 203–219. See also A. Jordan and A. Lenschow, “Environmental Policy Integration: A State of the Art Review”, *Environmental Policy and*

Simply put, policy integration (whether related to environment or other policy sectors) refers to two (or more) policy sectors, where one (or more) among these takes into account the goals of the other(s). Numerous policy issues are structurally multilevel and cross-sectoral, affecting different policy domains, territorial levels, governance systems, and jurisdictions.²¹ Policy integration deals with the effective orchestration needed to create cohesion between local and global levels of governance and policy sectors, thus lending itself to an institutional perspective.²² The concept was first introduced by Arild Underdal in 1980,²³ and has been honed through different approaches and definitions including “policy coherence”, “whole-of-government”, “collaborative governance”, “policy coordination”, and “holistic governance”.²⁴ In the specific case of EPI, Jordan and Schout propose a synthetic definition of EPI as “a process through which ‘non’ environmental sectors consider the overall environmental consequences of their policies, and take active and early steps to incorporate an understanding of them into policy-making at all relevant levels of governance”.²⁵ In addition to considering how this unfolds in analyses of the interactions between different sources of law, we also move beyond more simplistic

Governance, 20 (2010) 147–158; W. Lafferty and E. Hovden, “Environmental Policy Integration: Towards an Analytical Framework”, *Environmental Politics*, 12 (2003) 1–22; Å. Persson *et al.*, “Environmental Policy Integration: Taking Stock of Policy Practice in Different Contexts”, *Environmental Science and Policy*, 85 (2018) 113–115. For definitions of policy integration see P. Burstein, “Policy Domains: Organization, Culture, and Policy Outcomes”, *Annual Review of Sociology*, 17 (1991) 327–350; A.E. Jochim and P.J. May, “Beyond Subsystems: Policy Regimes and Governance”, *supra*; R.O. Keohane and D.G. Victor, “The Regime Complex for Climate Change”, *supra*; C.J. Termeer *et al.*, “Governance Capabilities for Dealing Wisely with Wicked Problems”, *Administration and Society*, 47 (2013) 680–710; G. Peters, “What Is so Wicked About Wicked Problems? A Conceptual Analysis and a Research Program”, *Policy and Society*, 36 (2017) 385–396; P. Trein *et al.*, “Policy Coordination and Integration: A Research Agenda”, *Public Administration Review*, 81(5) (2020) 973–977.

21 J.J. Candel and R. Biesbroek, “Toward a Processual Understanding of Policy Integration”, *supra*; M. Di Gregorio *et al.*, “Multi-level Governance and Power in Climate Change Policy Networks”, *Global Environmental Change*, 54 (2019) 64–77; P. Adriázola *et al.*, *Multi-level Climate Governance Supporting Local Action*, *supra*.

22 L.B. Andonova *et al.*, “National Policy and Transnational Governance of Climate Change: Substitutes or Complements?”, *International Studies Quarterly*, 61 (2017) 253–268; K.W. Abbott, “Strategic Ordering in Polycentric Governance”, *supra*.

23 A. Underdal, “Integrated Marine Policy: What? Why? How?”, *Marine Policy*, 4(3) (1980) 159–169.

24 For an exhaustive review of these and similar terminologies, see J. Tosun and A. Lang, “Policy Integration: Mapping the Different Concepts”, *Policy Studies*, 38 (2017) 553–570.

25 A. Jordan and J. Schout, *The Coordination of the European Union: Exploring the Capacities of Networked Governance* (Oxford University Press 2006), at 66.

visions of EPI as synonymous with policy coordination between different sectors,²⁶ to consider a wide spectrum of dimensions as holding the potential to help or hinder integration. In particular, we hypothesize that coordination (both horizontal and vertical), leadership, information and participation, and funding are key here.

EPI is also one of the key principles of transnational governance for sustainable development,²⁷ a goal intended to present a viable alternative to an industrially-oriented but environmentally dangerous mode of production, all while maintaining growth and social justice,²⁸ though many scholars have questioned whether maintaining all of these objectives is really viable.²⁹ EPI took center stage in the seminal 1987 report ‘Our Common Future’ (better known as the Brundtland Report) which first outlined the sustainable development approach in a transnational governance forum, though first developed in civil society. From that moment on, sustainable development became the watchword for environmental politics in global governance, including treaty processes, as well as at the national and subnational levels.³⁰ Accordingly, EPI was one of the leading objectives of the UN’s Agenda 2030, introduced in 2015, and began to grow in importance in EU politics from the

26 A. Jordan and A. Lenschow, “Environmental Policy Integration”, *supra*.

27 B. Bornemann and S. Weiland, “The UN 2030 Agenda and the Quest for Policy Integration: A Literature Review”, *Politics and Governance*, 9 (2021) 96–107.

28 D.W. Pearce and J.J. Warford, *World Without End: Economics, Environment, and Sustainable Development* (Oxford University Press 1993).

29 P. Descheneau and M. Paterson, “Between Desire and Routine: Assembling Environment and Finance in Carbon Markets”, *Antipode*, 43 (2011) 662–681; H. Stevenson and J. S. Dryzek, *Democratizing Global Climate Governance* (Cambridge University Press 2014); N. Carter “Greening the Mainstream: Party Politics and the Environment”, *Environmental Politics*, 22 (2013) 73–94; S.M. Lélé, “Sustainable Development: A Critical Review”, *World Development*, 19 (1991) 607–621.

30 On sustainable development in global governance see F. Biermann, N. Kanieb and R.E. Kima, “Global Governance by Goal-Setting: The Novel Approach of the UN Sustainable Development Goals”, *Current Opinion in Environmental Sustainability*, 26–27 (2017) 26–31; J. Meadowcroft *et al.* (eds.), *What Next for Sustainable Development?: Our Common Future at Thirty* (Edward Elgar 2019); S.C. Aykut, “Taking a Wider View on Climate Governance”, *supra*; H. Bulkeley *et al.* (eds.), *Transnational Climate Change Governance* (Cambridge University Press 2014). On national and local governance see K.J. Bowen *et al.*, “Implementing the ‘Sustainable Development Goals’: Towards Addressing Three Key Governance Challenges—Collective Action, Trade-Offs, and Accountability”, *Current Opinion in Environmental Sustainability*, 26–27 (2017) 90–96.

Cardiff European Council of 1998 onwards, eventually becoming a cemented objective of the EU.³¹

Despite rhetorical commitment, EPI has in practice been more complex to achieve. First, multilevel governance implies limits, amongst which one of the most evident is the cost-benefit *ratio* of a high number of policy agents, where involving more actors does not necessarily increase efficiency.³² Second, the literature demonstrates that rhetoric has not always translated into practice.³³ This has been attributed to party politics, particularly where right-wing parties have replaced left-wing coalitions in power.³⁴ Other accounts point to problems of scale: “while the rationale of the EPI concept seems straightforward and desirable at a global level, it is more complex and difficult to implement in concrete terms at sector level”.³⁵ Continents, countries, regions, and subnational territories have their own peculiarities in terms of policy-making and environmental/climate policies. In this regard, the following chapters provide a more detailed review of the transnational and European frameworks (Chapter 2), of Austrian and Italian legislation and strategies (Chapter 3), and of the single case studies considered in this book (Chapter 4).

While our general conceptual frame is EPI, the specific focus of the research in this volume is CPI,³⁶ arguably the environmental issue that attracts the

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- 31 S. Baker *et al.* (eds.), *The Politics of Sustainable Development: Theory, Policy and Practice Within the European Union* (Routledge 1997); B. Bornemann and S. Weiland, “The UN 2030 Agenda and the Quest for Policy Integration”, *supra*.
- 32 M.J. Dorsch and C. Flachsland, “A Polycentric Approach to Global Climate Governance”, *Global Environmental Politics*, 17 (2017) 45–64.
- 33 H. Runhaar *et al.*, “Environmental Assessment in the Netherlands: Effectively Governing Environmental Protection? A Discourse Analysis”, *Environmental Impact Assessment Review*, 39 (2013) 13–25.
- 34 N. Carter, “Greening the Mainstream”, *supra*; T. Bach and K. Wegrich (eds.), *The Blind Spots of Public Bureaucracy and the Politics of Non-Coordination* (Palgrave Macmillan 2019); T. Hustedt and T. Danken, “Institutional Logics in Inter-Departmental Coordination”, *supra*. On right-wing entries and effects on environmental policy integration see A. Jordan and A. Lenschow, “Environmental Policy Integration”, *supra*.
- 35 Å. Persson, “Environmental Policy Integration: An Introduction”, *PINTS—Policy Integration for Sustainability Background Paper, Stockholm Environment Institute*, (2004), at 1. Available online at <https://www.sei.org/publications/environmental-policy-integration-introduction/>.
- 36 G.R. Biesbroek *et al.*, “Europe Adapts to Climate Change: Comparing National Adaptation Strategies”, *Global Environmental Change*, 20 (2010) 440–450; N.M. Schmidt and A. Fleig, “Global Patterns of National Climate Policies: Analyzing 171 Country Portfolios on Climate Policy Integration”, *Environmental Science and Policy*, 84 (2018) 177–185; M. Nilsson and L.J. Nilsson, “Towards Climate Policy Integration in the EU: Evolving Dilemmas and Opportunities”, *Climate Policy*, 5 (2005) 363–376; C. Adelle and D. Russel, “Climate Policy Integration”, *supra*; P. Mickwitz *et al.* “Climate Policy Integration, Coherence and

most attention at present. As highlighted by Schmidt and Fleig, CPI can be seen as increasing exponentially at a global level, if one considers the number of national (and subnational) pieces of climate legislation that refer to a range of policy sectors. Climate change has been studied as a multilevel, multi-sector and multi-actor challenge,³⁷ and as such climate policies cannot be effective where limited to a discreet 'climate' policy area – by definition, climate change must be tackled through the regulation of those policy sectors that have historically created it, whether the goal is mitigation or adaptation.³⁸ All this suggests that further comparative studies are needed to supplement those few that have already tackled CPI specifically.³⁹ The current volume presents

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- Governance”, *Partnership for European Environmental Research*, Report No. 2 (2009), available at <https://hal.inrae.fr/hal-02598475/document>; C. Dupont and S. Oberthür, “Insufficient Climate Policy Integration in EU Energy Policy: The Importance of the Long-Term Perspective”, *Journal of Contemporary European Research*, 8 (2012) 228–247.
- 37 A. Dewulf, S. Meijerink and H. Runhaar, “The Governance of Adaptation to Climate Change as a Multi-level, Multi-sector and Multi-actor Challenge: A European Comparative Perspective”, *Journal of Water and Climate Change*, 6 (2015) 1–8.
- 38 *Ibid.*; C. Adelle and D. Russel, “Climate Policy Integration”, *supra*; M.W. Bauer *et al.* (eds.), *Dismantling Public Policy: Preferences, Strategies, and Effects* (Oxford University Press 2012); J. Casado-Asensio and R. Steurer, “Integrated Strategies on Sustainable Development, Climate Change Mitigation and Adaptation in Western Europe: Communication Rather Than Coordination”, *Journal of Public Policy*, 34 (2014) 437–473; R. Nordbeck and R. Steurer, “Integrated Multi-sectoral Strategies as Dead Ends of Policy Coordination: Lessons to Be Learned from Sustainable Development”, *Environment and Planning C: Government and Policy*, 34 (2016) 737–755.
- 39 On CPI at the European level see A. Dewulf, S. Meijerink and H. Runhaar, “The Governance of Adaptation to Climate Change as a Multi-level, Multi-sector and Multi-actor Challenge: A European Comparative Perspective”, *Journal of Water and Climate Change*, 6 (2015) 1–8. On the specific example of water, see S. Brouwer, T. Rayner and D. Huitema, “Mainstreaming Climate Policy: The Case of Climate Adaptation and the Implementation of EU Water Policy”, *Environment and Planning C: Government and Policy*, 31 (2013) 134–153. On CPI at the national and regional levels, see C. Kettner and D. Kletzan-Slamanič, “Climate Policy Integration on the National and Regional Level: A Case Study for Austria and Styria”, *International Journal of Energy Economics and Policy*, 8 (2018) 259–269; I. Galarraga, M. Gonzalez-Eguino and A. Markandya, “The Role of Regional Governments”, *supra*; C. Wamsler and S. Pauleit, “Making Headway in Climate Policy Mainstreaming and Ecosystem-Based Adaptation: Two Pioneering Countries, Different Pathways, One Goal”, *Climatic Change*, 137 (2016) 71–87; M. Landauer, S. Juhola and J. Klein, “The Role of Scale in Integrating Climate Change Adaptation and Mitigation in Cities”, *Journal of Environmental Planning and Management*, 62 (2018) 741–765. On CPI in the Alpine region, see V. Cattivelli, “Climate Adaptation Strategies and Associated Governance Structures in Mountain Areas. The Case of the Alpine Regions”, *Sustainability*, 13(5) (2021) 1–24.

cross-national and cross-subnational comparisons amongst a number of policy sectors, as described in more detail in the following section.

1.2 *Case Studies and Policy Sectors*⁴⁰

The explorations of subnational CPI in this book focus on particular subnational governments in Italy and Austria, and specific policy areas. The subnational governments chosen are the Autonomous Provinces of Bolzano and Trento in Italy, and the Austrian *Länder* Tyrol and Vorarlberg (see Map 1). These cases are comparable for a variety of reasons, as well as shedding light on broader CPI issues. The four subnational areas are part of the Alpine macro-region, one of the four macro-regions composing Europe and defined as territories that “span several states with some common morphological or climatic features and adopt wider-scale strategies which are not mandatory or do not take sufficient account of the specificities of any included region”.⁴¹ They are geographically close, meaning that the climate issues they deal with are often shared, yet they also present variation in terms of their subnational legal and governance systems. In the language of social science research design, these cases allow us to keep our independent variable (CPI) more or less constant, while ensuring significant variation on dependent variables (the factors we hypothesize as important for determining successful CPI, outlined below).

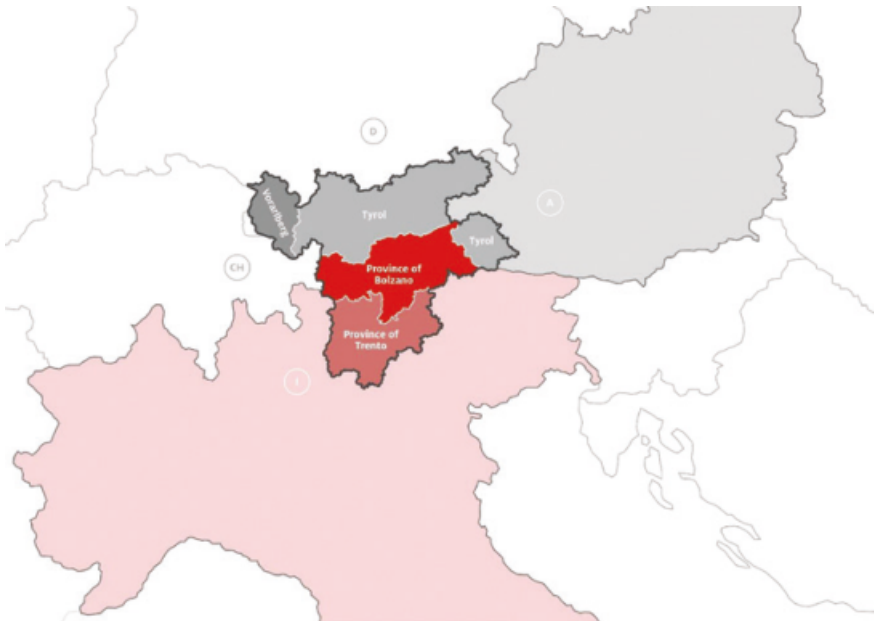
In more detail, the Euregio area, a European Grouping of Territorial Cooperation (EGTC) created in 2011 and providing an institutional architecture for cross-border cooperation between Trento, Bolzano and Tyrol, shares a common history, common problems and the political will to solve them in a coordinated way. *Land Vorarlberg* also shares a common history with the other three subnational cases but is not a member of the Euregio area, though it is involved in political coordination in the Euregio through its observer status at the *Dreier Landtag*, the biannual meeting between the legislative assemblies of Euregio members.⁴² It thus provides an interesting comparison point to evaluate the Euregio framework for CPI, since it is a clear example of a regional government that is active on issues of climate protection.⁴³

40 This section and section 2 draw on the proposal for the project this volume is based on, authored by Federica Cittadino: see footnote 5.

41 V. Cattivelli, “Climate Adaptation Strategies”, *supra*, at 1.

42 See <https://www.landtag-bz.org/de/dreier-landtag.asp>.

43 P. Bußjäger, “Die territoriale Dimension der österreichischen Demokratie in vergleichender Perspektive”, in L. Helms and D.M. Wineroither (eds.) *Die österreichische Demokratie im Vergleich* (Nomos 2017) 223–250.



MAP 1 Case study locations

Both the Italian Autonomous Provinces and the Austrian *Länder* share some legislative powers with their respective national governments in the sectors investigated: namely transport, energy and water, and spatial planning. In Italy, a regional state, legislation on environmental protection is an exclusive national competence of the Italian State, yet the regions and Autonomous Provinces hold exclusive or shared powers over matters concerning environmental protection. Climate change is not a discreet policy sector: it overlaps with others, and legislative measures can thus be adopted at the national or regional levels depending on whether they fall under the general competence on environmental protection, or under regional sectoral policies. In Austria, a federal state, environmental protection is not listed as an exclusive competence of the *Bund*, yet neither does it fall within the residual powers of the *Länder*. Instead, environmental protection is considered a “*Querschnittsmaterie*” (a shared area) that includes energy, water, spatial planning, and nature protection.⁴⁴ Thus, the selected policy areas are considered partly within the exclusive competence of the *Bund* (e.g. water), partly within

44 M. Stelzer, *The Constitution of the Republic of Austria: A Contextual Analysis* (Bloomsbury 2011).

the exclusive competence of the *Länder* (e.g. nature protection), and partly as “*Querschnittsmaterien*” (e.g. energy and spatial planning). In addition, *Länder* often rely on the Austrian constitutional clause on “private-sector administration” to implement climate strategies.⁴⁵

Beyond these constitutional characteristics, the territories discussed in this volume also face some common climate threats. As stated in the Climate Action Plan released by the Alpine Convention, the

Alps see a faster pace and higher impacts of climate change than other European regions. Average temperature rise in the Alpine area is nearly twice as much as in the surrounding areas and consequences of climate change such as more frequent extreme weather events and natural hazards affect society and economy in the Alps in an over-proportional way. At the same time, the Alpine area includes large emission sources, especially from transport, buildings and tourism and thus has a significant potential for becoming a model region for smart decarbonization.⁴⁶

Other assessments concur and give a more precise overview of the Alpine region’s peculiarities in terms of climate change. For example, the European Environment Agency’s report on Climate change, impacts and vulnerability in Europe (2016) identifies the following: a higher than the European average rise in temperature, a decrease in glacier extent and volume, the upward shift of plant and animal species, the high risk of species extinctions, increasing risks of forest pests, increasing risks from rock falls and landslides, changes in hydropower potential, and a decrease in ski tourism.⁴⁷ Similar observations are made in the Intergovernmental Panel on Climate Change (IPCC) Special Report on the Ocean and Cryosphere in a Changing Climate (2019).⁴⁸

A focus on the policy sectors of transport, energy and water, and spatial planning was chosen not only to delimit and thus explore the findings of the research in greater depth, but because climate change is predicted to have specific impacts in these areas, making them clear candidates for subnational CPI. Transport, for example, is the main source of greenhouse gas (GHG) emissions

45 Art. 17 Austrian Constitution. See <https://www.constituteproject.org/> for English translation.

46 See <https://www.alpconv.org/en/home/news-publications/publications-multimedia/detail/climate-action-plan-20/>.

47 See <https://www.eea.europa.eu/publications/climate-change-impacts-and-vulnerability-2016>.

48 See <https://www.ipcc.ch/srocc/>.

in the territories selected. One key area where the Euregio works is transport policy, given the volume of cross-border transit in the area, highlighting the transboundary nature of this issue. In the energy and water sector, policies on hydroelectric power may cause conflicts around water use given the long-term decrease of availability expected as a consequence of climate change.⁴⁹ Spatial planning may contribute to both climate change mitigation and adaptation in different ways. For instance, urban planning may determine the need for reduced or increased car traffic, which in turn is responsible for GHG emissions.⁵⁰ Furthermore, spatial planning may have an impact on the permeability of soil, which in turn influences the capacity to react to extreme weather events.⁵¹ In the next section, we present our research questions and the specific dimensions we hypothesize have an effect on CPI.

2 What Shapes Climate Policy Integration and the Subnational Level? A Research Agenda and Hypotheses

To investigate how CPI unfolds in different subnational authorities and policy sectors, answers to the following questions are needed:

- a) To what extent and by which means have the Autonomous Provinces of Trento and Bolzano in Italy and *Länder* Tyrol and Vorarlberg in Austria integrated climate policies in sectors where they exercise exclusive and shared legislative powers?
- b) What institutional factors prevent or facilitate this integration at the subnational and local levels, in terms of both policy-making and implementation?

Following findings in the existing literature, five main institutional dimensions can be hypothesized to play potentially decisive roles in shaping CPI:

- 1) coordination among authorities responsible for sectoral policies (horizontal/vertical and formal/informal);
- 2) public participation;

49 S. Brouwer, T. Rayner and D. Huitema, "Mainstreaming Climate Policy", *supra*; M. Zebisch *et al.*, *Rapporto sul Clima Alto Adige 2018* (Eurac Research 2018). Available online at https://www.klimaland.bz/wp-content/uploads/Klimareport_it.pdf.

50 Permanent Secretariat of the Alpine Convention, *Climate-neutral and Climate-resilient Alps 2050* (2019). Available online at <https://issuu.com/alpconv/docs/climateneutralclimateresilientalps2>.

51 M. Zebisch *et al.*, *Rapporto sul Clima Alto Adige 2018*, *supra*.

- 3) information on climate change with a main focus on availability to the public, and its communication (at what stage and by what means);
- 4) leadership (both political and in the administration);
- 5) dedicated funding.

These factors are interlinked in various ways and often mutually dependent upon one another. In the following we provide a brief overview of these, relating them to the achievement of CPI in subnational policy sectors.

Vertical integration is inherent in all multilevel systems – whether federal or regional. Such systems are characterized by the presence of national and subnational governments entitled to exercise legislative competences over a range of matters, some of which are *de jure* or *de facto* shared competences.⁵² Governing climate change poses specific challenges since it requires a high level of vertical coordination in multiple policy sectors. Mitigation and adaptation policies are transversal to a number of national, regional, and shared policy fields such as environmental conservation, energy policy, water management, spatial planning, and others. In that sense, paying attention to vertical coordination in discussions of the effectiveness of CPI is widely accepted as key. Horizontal integration, on the other hand, refers to the fact that the governance of climate change is not contained within any single sectoral policy at either the national or subnational level. Rather, to tackle climate change, national and subnational governments need to enact legislative and administrative measures in a range of sectoral policy areas where they must coordinate their interventions in separate but overlapping policy fields. Cooperation across sectors between policymakers and policy-officers operating at the same level is therefore necessary to ensure both coherence and effectiveness.⁵³ Thus, horizontal coordination is also key to understanding CPI, and attention to both horizontal and vertical coordination is needed for a more holistic understanding of policy-making at the subnational level. In addition to this, horizontal and vertical coordination can unfold in different ways. While legal scholars and political scientists alike have tended to focus on the presence or absence of formal frameworks for coordination, policy scholars point to the

52 M. Alberton and F. Cittadino, *La tutela dell'ambiente tra Stato e Regioni alla luce della riforma costituzionale* (2015); M. Alberton, F. Cittadino and E. Mitrotta, "La tutela dell'ambiente: la prevenzione delle alluvioni e la qualità dell'aria", in W. Obwexer *et al.* (eds.), *EU-Mitgliedschaft und Südtirols Autonomie II: die Auswirkungen der EU-Mitgliedschaft auf die Autonomie des Landes Südtirol am Beispiel ausgewählter Gesetzgebungs- und Verwaltungskompetenzen – eine Fortsetzung; Handbuch* (Verlag Österreich 2019) 333–379.

53 G. Peters, "Managing Horizontal Government. The Politics of Coordination", *Public Administration*, 76(2) (1998) 295–311.

need to also consider more informal, everyday occasions for coordination.⁵⁴ Our research therefore focuses on both formal and informal mechanisms of intergovernmental (vertical) coordination, such as managerial mainstreaming, and intra- and inter-organizational mainstreaming (horizontal coordination) where collaborations are promoted in more informal ways.

Turning to the next factor we consider pertinent for evaluating CPI, participation, like coordination, highlights the importance of looking at how climate-related policies are elaborated and implemented at the subnational level.⁵⁵ Environmental participation is often studied in terms of the principles and rights set at international and EU levels, yet the literature on participation at the subnational/local levels tends to be addressed with a view to either testing democratic theory or discussing community-based natural resource management.⁵⁶ Beyond these approaches, participation has been found to be key to effective policy-making and implementation in a perspective of ‘civic environmentalism’, which hypothesizes that broad stakeholder involvement in environmental policy-making will lead to both more efficient and more legitimate or accepted policies.⁵⁷ Although this view is not strictly linked to CPI, we reasoned that these types of considerations are also pertinent to understanding the integration of climate issues in subnational decision-making: CPI could be driven by public participation. We therefore include examinations of mechanisms for subnational-level participation across the policy areas focused upon, to investigate if and how participation contributes to policymaking, and the integration of environmental aims across different policy areas. It is important to acknowledge that, in line with the institutional perspective followed in this book, we consider a particular type of participation, namely institutionalized and formal participation. We do not discuss broader forms of participation, such as grassroots and local community activism or social movements. This is not to say that such participation is not important: the recent wave of mobilization that began in the late 2018 and exploded in 2019 (despite a partial stop due to the pandemic from 2020) which brought billions of people – and young people especially – to the streets to protest for climate justice during the

54 C. Wamsler and S. Pauleit, “Making Headway in Climate Policy Mainstreaming”, *supra*.

55 P. Burton and J. Mustelin, “Planning for Climate Change: Is Greater Public Participation the Key to Success?”, *Urban Policy and Research*, 31 (2013) 399–415.

56 M. Cox, G. Arnold and S. Villamayor Tomás, “A Review of Design Principles for Community-Based Natural Resource Management”, *Ecology and Society*, 15(4) (2010).

57 For example, K. Bäckstrand and E. Lövbrand, “The Road to Paris: Contending Climate Governance Discourse in the Post-Copenhagen Era”, *Journal of Environmental Policy and Planning*, 21 (2019) 519–532.

global strikes of Fridays For Future or in the civil disobedience of Extinction Rebellion certainly matter and are discussed in a wide range of literature.⁵⁸ Rather, this broader view of participation could not be integrated into the research methodology, which is not suited to tracing the influence of grassroots and social movement actions. We also take the view that subnational CPI is likely to be more directly influenced by the formal sorts of participation subnational institutions seek out themselves (and note that this may even be a response to grassroots and social movement actions).

Information is another key element and a precondition for effective coordination and robust participation: without information on climate change and thus the need for integration and specific responses in different policy sectors, no amount of coordination or participation is likely to lead to effective CPI. We understand information in two different ways and pick up on this theme across various chapters (see below). First, as regards the extent to which climate change-related data and analyses are available to policymakers, our research indicates that this can be investigated through attention to participatory mechanisms, which include consultations with experts in various aspects of climate change. The availability of such information is seen as a crucial input for CPI. As far as making information available to and communicating with the public, and especially stakeholders participating in decision-making or implementation is concerned,⁵⁹ existing literature has found that integration may be hindered by a lack of understanding among policymakers of the consequences of climate change for their sectors.⁶⁰ We pick up this theme in Chapter 9 (see below).

- 58 On Fridays For Future, see for example: J. de Moor *et al.*, “New Kids on the Block: Taking Stock of the Recent Cycle of Climate Activism” *Social Movement Studies*, 20 (2021) 619–625; L. Zamponi *et al.*, “(Water) Bottles and (Street) Barricades: The Politicisation of Lifestyle-centred Action in Youth Climate Strike Participation”, *Journal of Youth Studies*, 6 (2022) 1–22. On Extinction Rebellion, see: D. Stuart, “Radical Hope: Truth, Virtue, and Hope for what is Left in Extinction Rebellion”, *Journal of Agricultural and Environmental Ethics*, 33 (2020) 487–504; W. Ginanjar and A. Mubarrok, “Civil Society and Global Governance: The Indirect Participation of Extinction Rebellion in Global Governance on Climate Change”, *Journal of Contemporary Governance and Public Policy*, 1 (2020) 41–52. For a comparison of the two, see: J. de Moor, “Postapocalyptic Narratives in Climate Activism: Their Place and Impact in Five European Cities”, *Environmental Politics*, (2021) 1–22; B. Richardson, *From Student Strikes to the Extinction Rebellion: New Protest Movements Shaping our Future* (Edwar Elgar 2020).
- 59 K. Mogelgaard *et al.*, “From Planning to Action: Mainstreaming Climate Change Adaptation into Development”, *World Resources Institute Working Paper*, (September 2018). Available online at <https://files.wri.org/d8/s3fs-public/from-planning-action-mainstreaming-climate-change-addaptation-into-development.pdf>.
- 60 T. Rauken, P. Kristen Mydske and M. Winsvold, “Mainstreaming Climate Change Adaptation at the Local Level”, *Local Environment*, 20 (2015) 408–423.

Politics, and the role of politicians, is also touched upon in discussions of how leadership affects CPI. Leadership concerns the extent to which there is a clear impetus for CPI from politicians or top-level managers in subnational administrations. Leadership may also come from outside the subnational administration – for example from international and national leaders or transnational bodies such as the Euregio – but its translation into internal leadership is still hypothesized as key. Leadership is also interlinked with other factors understood as important for effective CPI, including horizontal coordination across different policy units and funding.⁶¹ The institutional perspective also guides our examination of leadership, which is based on the self-representations and claims advanced by administrative figures and politicians. We also look more critically at their effectiveness through the accounts offered by civil society and analyze the real evolution of GHG emissions in the areas under consideration. One important aspect of leadership, which also ties in with considerations on information provision, is the level of urgency attached to questions of CPI by leaders – this is suggested to be a necessary complement for leadership to advance environmental policy integration.⁶² On the other hand, politicians at all levels of elected government have been found to be more susceptible to short-term perspectives to the detriment of the long-term aims involved in CPI, which may suggest a negative effect on CPI.⁶³

Finally, a factor that needs little explanation as an important source for investigating the success of CPI is the availability of dedicated funding. Though certainly not sufficient for CPI, dedicated finances are considered potentially necessary: financial backing has been described as giving climate policy integration ‘teeth’ in this vein.⁶⁴ More generally, the budget assigned to any policy portfolio is a transversal power that is instrumental to the exercise of related substantive powers.⁶⁵ Finances can allow steps towards both horizontal and vertical coordination, for example by underpinning the creation of new positions and forums within subnational governments, and support the creation of external arenas for public participation. Finances can also bolster information sharing through dedicated communication strategies.

61 *Ibid*; A. Ross and S. Dovers, “Making the Harder Yards: Environmental Policy Integration in Australia”, *Australian Journal of Public Administration*, 67 (2008) 245–260.

62 T. Christensen and P. Lægreid, “Governmental Autonomisation and Control: The Norwegian Way”, *Public Administration and Development: The International Journal of Management Research and Practice*, 24 (2004) 129–135.

63 C. Adelle and D. Russel, “Climate Policy Integration”, *supra*.

64 K. Mogelgaard *et al.*, “From Planning to Action”, *supra*.

65 A. Valdesalici, *Federalismo fiscale e responsabilizzazione politico-finanziaria: comparazione giuridica ed esercizi di misurazione del diritto* (ESI 2018).

2.1 *A Note on Methodology*

To answer these questions and gather data on these five dimensions hypothesized as key explanatory factors for CPI, data gathering and analysis was carried out in two main stages. First, relevant written documents dealing with climate change integration in the policy sectors of the different subnational authorities were gathered and analyzed for content referring to the five dimensions. In a second stage, the data was integrated via interviews with relevant stakeholders to shed light on more procedural and informal dynamics.

In more detail, the first phase of the research consisted of a Qualitative Document Analysis (QDA), a method also used in policy integration research in other subnational contexts.⁶⁶ Documents were gathered by contacting the relevant policy departments at each subnational authority. We limited documents to those from 2005 onwards, in line with the entry into force of the Kyoto Protocol to the UNFCCC which we consider a clear milestone in climate governance as it was the first international agreement through which industrialized countries committed to reducing GHG emissions. The documents gathered were public documents relevant to our purposes whose target audience was external to the administration. The latter are particularly informative about processes of decision-making. This initial data-gathering step was then followed up by searches on publicly available websites of the subnational authorities to identify and consult sections on climate change and general plans or strategies on climate change. These general, public-facing texts helped to contextualize the approach to climate change in the different subnational areas. A similar search was then carried out for the webpages of the spatial planning, energy and water, and transport departments of each subnational authority to gather all documents referring to climate change mainstreaming. Other sources were used to supplement this dataset in order to provide more data on leadership, information and funding. For leadership, the data were supplemented with electoral programs within the timeframe considered, in order to evaluate the salience assigned to climate change (and climate change mainstreaming in particular) across time, and with data on the evolution of GHG emissions over time. For the information dimension, materials from relevant information campaigns were included wherever possible. For funding, an analysis of the budget information available for CPI in each policy sector was

66 On QDA see D. Altheide *et al.*, "Emergent Qualitative Document Analysis", in S. Nagy Hesse-Biber and P. Leavy (eds.), *Handbook of Emergent Methods* (Guilford 2008) 127–151. On its application see e.g. M.I. England *et al.*, "Climate Change Adaptation and Cross-Sectoral Policy Coherence in Southern Africa", *Regional Environmental Change*, 18 (2018) 2059–2071.

conducted, though the comparability and availability of such data varies as discussed in depth in Chapter 8. These data were then analyzed with the five dimensions of interest in mind by the chapter authors.

The documents also formed the basis for the interviews conducted in the second stage. Interviews were used to supplement, challenge or corroborate the initial data, and also served to gain more in-depth insights into CPI processes. We collected a total of thirty-nine interviews: twelve in the Autonomous Province of Bolzano, eleven in the Autonomous Province of Trento, eight in *Land Tyrol*, and eight in *Land Vorarlberg*. The interviews were conducted online, recorded, and anonymized.⁶⁷ They were held with relevant stakeholders, selected on the basis of both expert knowledge in the research team and documentary data. Different types of stakeholders were interviewed in each subnational area, with the aim being to interview key informants in specific contexts. The guiding criterion for mapping stakeholders was to achieve a balanced representation of the sectors covered in the project (transport, energy and water, and spatial planning), and to include both institutional and non-institutional perspectives. Political figures, administrative figures, technical experts and members of civil society organizations were interviewed.⁶⁸ A general but flexible guide was followed for the interviews and is included in the appendices. Minor adaptations were made for each interview according to the interviewees' profiles and fields of expertise. The interview results were summarized in an anonymized way in an interview report, available online.⁶⁹ In that report, as well as in the chapters of this book, interviews are cited using codes.⁷⁰

As noted at the outset of this Introduction, our intention was to produce not only in-depth findings about CPI in specific subnational authorities by policy sector, but also to produce findings of use beyond the cases explored here. In

67 In line with EU Regulation 2016/679 on General Data Protection Regulation – GDPR.

68 Interviews were conducted on Zoom and recorded; they lasted approximately one hour. The interview guide is available in the Appendix. Interviews were conducted from June–September 2021 by Niccolò Bertuzzi (Autonomous Province of Trento), Giada Giacomini (Autonomous Province of Bolzano), Alice Meier (*Länder Tyrol* and Vorarlberg) and Alice Valdesalici for the officers dealing with financial issues in the Provinces of Bolzano and Trento.

69 N. Bertuzzi *et al.* (eds.), *Interview Report Bolzano, Trento, Vorarlberg and Tyrol* (2021). The interview report is cited only when the opinions referred to in the book emanate not from the interviewees but on the basis of reflections drawn from the interview results more generally as contained in the report.

70 By way of example, the first interview conducted in the Autonomous province of Trento is referred to as IntTN_01, the second as IntTN_02, and so on. Abbreviations of codes are explained in the Acronyms, Abbreviations and Symbols in this volume.

this vein, the comparative research design also generates context-specific findings that point to solutions that could be applied under similar conditions in other subnational authorities.⁷¹ By relying on qualitative methods to generate rich and detailed descriptions of CPI in practice across different policy areas and subnational authorities, the research framework lays the foundation for contextualized findings to emerge that can contribute to theorize “the drivers of policy coordination and integration beyond the simple listing of explanatory factors”.⁷² In the same vein, most studies on EPI or CPI have tended to adopt approaches that are outcome-focused. Here, we also seek to pay attention to outcomes, but predominantly to policy processes as the sites where CPI is actually shaped,⁷³ including to how those processes have changed and evolved over time. This focus on policymaking also bolsters the potential for the findings to migrate to other geographical contexts and policy sectors.

3 Structure of the Book

Part 1 of the book (Chapters 1, 2 and 3) present legal analyses of climate change legislation and policy at the international, European, national and subnational levels. Part 2 (Chapters 4, 5 and 6) brings together the chapters on the policy sectors, namely transport, energy and water, and spatial planning. Each is discussed in a cross-national and cross-subnational perspective. Part 3 (Chapters 7, 8 and 9) focuses instead on the role of each of the five dimensions hypothesized to shape CPI. In Chapter 10, the main results are summarized and the comparative results discussed with a view to the lessons they suggest about achieving CPI under specific conditions and in specific policy areas.

In Chapter 1, Mariachiara Alberton explores the challenges and opportunities for international and European climate governance. Starting from the observations presented in this Introduction, she explores the orientation of climate change mitigation policies around the goal of limiting the increase in global average temperatures to well below 2 degrees Celsius following the adoption

71 F. Palermo and K. Kössler, *Comparative Federalism: Constitutional Arrangements and Case Law* (Hart Publishing 2017).

72 P. Trein *et al.*, “Policy Coordination and Integration”, *supra*, at 3; see also G. Capano and M. Howlett, “Causal Logics and Mechanisms in Policy Design: How and Why Adopting a Mechanistic Perspective Can Improve Policy Design”, *Public Policy and Administration*, 36 (2021) 141–162.

73 *Ibid.*; J.J. Candel and R. Biesbroek, “Toward a Processual Understanding of Policy Integration”, *supra*; A. Jordan and J. Schout, *The Coordination of the European Union*, *supra*.

of the Paris Agreement. Under the same, states have committed to developing and implementing adaptation plans and actions. In this arena, the EU aims to become the world's first climate-neutral economy by 2050. Chapter 2 focuses instead on the national dimension, bridging the international and European climate governance approaches with the subnational authorities at the heart of the book. Maria Bertel and Federica Cittadino describe the relevant norms at the constitutional and sub-constitutional levels. As Austria and Italy can be characterized as decentralized systems (Austria as a federal state, Italy as a regional state), an analysis of the distribution of competences (regarding spatial planning, energy and water, and transport) between the national and subnational levels helps set the scene for the following empirical chapters. In addition, the Chapter outlines the main strategies and legislation in the policy fields of transport, energy and water, and spatial planning, with a view to understanding to what extent national legislation integrates climate change in its normative production in the abovementioned fields of activity. Chapter 3 moves to the core of our research, investigating how and to what extent the two Autonomous Provinces of Trento and Bolzano and the *Länder* Tyrol and Vorarlberg address the challenges of climate change in sectors where they exercise either exclusive or shared legislative powers. Mariachiara Alberton, Peter Bußjäger, Alice Meier, and Sara Parolari clarify the reasons why the success of any climate policy at the subnational level depends mainly on the extent to which an authority is able to include climate-related objectives in their sectoral policies. This Chapter also includes valuable insights on the availability and provision of information to policymakers, a theme touched upon once more in Chapter 9.

In Part 2, the analyses assume an empirical nature. Chapter 4, by Alessio Claroni and Ekkehard Allinger-Csollich, focuses on the transport sector, examining the different strategies for a switch to more sustainable models of mobility. This variation derives from different legal and financial frameworks, and more importantly from the political will for and public acceptance of real and effective changes. Transport is a key sector, representing the most important challenge to reducing emissions in the Alpine region. While GHG emissions are falling in other policy sectors, in transport change is slow, with emissions either falling only slightly or increasing. Chapter 5 examines energy and water, another milestone in CPI and more generally in the fight against climate change. Giada Giacomini and Arnold Autengruber provide an assessment of the level of harmonization between climate change-related energy and water policies in the subnational cases in hand and the international legal regime. They investigate how and to what extent actors address the challenges of climate change given the varying competences assigned to subnational

authorities in Austria and Italy. In the final chapter of Part 2, Friederike Bundschuh-Rieseneder, Maria Tischler, and Esther Happacher consider the spatial planning sector. Chapter 6 discusses the rules around land use and the prevention of natural hazards, examining this topic from a cross-border legal perspective. In their analysis, both direct (such as explicit references in legal objectives) and indirect climate-relevant aspects are considered, alongside various steering elements such as land use plans.

In Part 3 discussions move to the dimensions identified as possible drivers (or obstacles) shaping CPI in the sectoral policies at the subnational level. In Chapter 7, Niccolò Bertuzzi, Peter Bußjäger, and Alice Meier analyze horizontal and vertical coordination and leadership, recognizing that climate change requires joint action and poses coordination challenges to be tackled through cooperative mechanisms at different levels of government and in different policy sectors. They note that commitment to climate change goals among political leaders and managers directly impacts CPI and shapes mitigation and adaptation actions in practice; at the same time, looking at the evolution of GHG emissions, they highlight that leadership rhetoric does not always translate into effective results, and that there is still room for improvement. Leadership at different levels of government and also across borders is in turn deemed to influence coordination, translating into tasks and measures that stimulate synergies between and within subnational authorities. In Chapter 8 Alice Valdesalici and Mathias Eller discuss funding. They take the view that the implementation of climate policy in the Autonomous Provinces of Trento and Bolzano and the *Länder* Tyrol and Vorarlberg depend to a great extent on whether and to what extent financial resources are available for this purpose. They explore the financing for climate change policy across the different sectors, reasoning that this dedicated funding may facilitate CPI but that better and comparable data are needed before full conclusions can be drawn. The final chapter of this section is authored by Martina Trettel, Franz Koppensteiner, and Melanie Plangger, and deals with the remaining dimensions of information for citizens and their participation, which they see as sometimes underestimated but increasingly relevant, at least at the rhetorical level. The Chapter focuses on information for citizens since research revealed that information for policymakers was mostly gathered through expert consultations, also discussed in the part on participation. Generally, the authors make the case for interlinking information and participation, with the former a clear precondition for the latter to be meaningful. The Chapter also focuses on how formal, institutionalized participation is organized and contributes to CPI.

The last chapter in the book brings all of the main findings together. In it, Federica Cittadino, Louisa Parks, Peter Bußjäger, and Francesca Rosignoli

reflect on how the dimensions considered in Part 3 shape CPI in the areas and policy sectors investigated in Part 2. The Chapter calls into question the possibility of creating a 'one size fits all' model for subnational CPI and takes a comparative, cross-sectoral approach in order to point to how different models might fit different contexts and suggest future research agendas.

PART 1

Setting the Scene of Climate Change Integration



The Challenges of Multilevel Climate Governance

Facing Hurdles in the EU's Climate Policy Ambitions

Mariachiara Alberton

1 Setting the International Scene for Climate Governance

The objective of current multilevel climate governance, including both mitigation and adaptation actions, is to reduce the causes of anthropogenic climate change globally through the adoption of measures that either lower the release of carbon emissions or remove carbon emissions currently in the atmosphere, while adjusting locally to the impacts of both anthropogenic and natural climate change through initiatives that prevent or minimize harm as well as exploit opportunities generated by changes to the climate system.

At international level, since the adoption of the Paris Agreement in 2015 by the United Nations Framework Convention on Climate Change (UNFCCC) Parties (at the Conference of the Parties, COP 21), mitigation policies should be oriented towards the internationally recognized goal of limiting the increase in global average temperatures to well below 2 degrees Celsius by 2100, and preferably to 1.5 degrees Celsius, compared to pre-industrial levels. In addition, under the Paris Agreement, States have committed to developing and implementing adaptation plans and actions and to provide the UNFCCC with periodic updates on such efforts.

Within the international arena, the European Union (EU) has been a prominent player as an advocate for the ratification of international agreements and the commitment to emissions reductions targets.¹ Under the UNFCCC (1992) the EU had already committed broadly to limit GHG emissions, while under the

1 See C. Damro, I. Hardie and D. MacKenzie, "The EU and Climate Change Policy: Law, Politics and Prominence at Different Levels", *Journal of Contemporary European Research*, 4 (2008) 179–192; M. Schreurs and Y. Tiberghien, "Multi-Level Reinforcement: Explaining European Union Leadership in Climate Change Mitigation", *Global Environmental Politics*, 7 (2007) 19–46; T. Rayner and A. Jordan, "Climate Change Policy in the European Union", *Climate Science*, (2016), available at <https://oxfordre.com/climatescience/view/10.1093/acrefore/9780190228620.001.0001/acrefore-9780190228620-e-47>. All internet sources in this chapter were accessed on 1 June 2022.

Kyoto Protocol (1997) it extended this to a specific reduction objective of 8% on 1990 levels (though with differentiated obligations of Member States) under the first commitment period (2008–2012), and to a further 18% reduction resulting in a total 20% reduction of GHG emissions on 1990 levels by 2020 under the second (2013–2020). Under the Paris Agreement the EU and its Member States jointly committed to a 55% GHG emissions reduction domestically by 2030, compared to 1990. The Paris Agreement shifts from the top-down approach of agreed national targets adopted under the Kyoto Protocol to the bottom-up system in which parties submit ‘progressive’ Nationally Determined Contributions (NDC) every five years according to a ratchet or ambition mechanism.

In light of the novelties of the Paris Agreement, the EU has initiated a process of climate and energy legislation revision through its “2030 Climate and Energy Framework”, resulting in a high degree of alignment with the Paris provisions and mechanisms² and through the “Fit for 55” Package (*infra*), explored in more depth below.

Despite this international consensus on the importance of combating climate change, GHG emissions have continued to rise, and the world is on track to achieve a dangerous level of global warming with direct social and economic consequences, as the Sixth Assessment Report “Climate Change 2022: Impacts, Adaptation and Vulnerability”, released in February 2022 by the Intergovernmental Panel on Climate Change (IPCC), dramatically confirms. The IPCC clearly reinforces the urgency of climate change action at multiple governmental levels and calls for efforts far beyond current international, supranational, national and sub-national commitments. In particular, this new alarming report, described by the UN Secretary-General Antonio Guterres as “an atlas of human suffering and a damning indictment of failed climate leadership”, offers the clearest indication to date of how a warmer world is leading to irreversible impacts and is pushing natural and human systems beyond their ability to adapt.

Thus, meeting the climate change challenge distinctly appears a crucial and compound task calling for multiple coordinated actions at all governmental levels, i.e., international, supranational, national and local levels. The following sections provide a brief summary of EU targets in the field of climate change,

2 See S. Gores *et al.*, *Turning Points for the Ambition of European Climate Targets: Getting Granular on the Process and Identifying Cornerstones for Discussion* (Öko Institut and Ecologic Institute 2020), available at <https://www.ecologic.eu/17472>; D. Torney and R. O’Gorman, “Adaptability versus Certainty in a Carbon Emissions Reduction Regime: An Assessment of the EU’s 2030 Climate and Energy Policy Framework”, *Review of European, Comparative & International Environmental Law*, 29 (2020) 167–176.

some data on emissions and climate impacts, and explore how peculiar multi-level dynamics affect the climate governance ambitions of the EU and its Member States. Other chapters in this book take up the analysis of national and subnational climate governance (Chapters 2 and 3).

2 The Rapidly Evolving EU Climate Policies and Targets

2.1 *EU Mitigation Policies and Targets*

Over the past years, in order to achieve greenhouse gas (GHG) reduction targets, the EU has built a complex climate policy architecture based on three pillars: the Emissions Trading System (ETS), which is a cap-and-trade system applying to some sectors and aiming to reduce emissions on a European level; the Effort Sharing (ES) instrument, which sets individual Member State targets in non-ETS sectors; and the Land Use, Land Use Change and Forestry (LULUCF) Regulation, which accounts for emissions and removals stemming from land-use activities.³ More specifically, the EU has combined binding objectives on emissions with additional binding targets on energy efficiency and renewable use for the year 2020 through its “2020 Climate and Energy Package”,⁴ a set of legal acts (including the ETS, ES, renewable energy and energy efficiency) mandating a 20% reduction of GHG emissions compared to 1990 levels, along with the achievement of a 20% improvement in energy efficiency and of a 20% share of renewables in the EU’s final energy consumption. The first two targets were binding on Member States, while the latter was ‘indicative’, i.e., not binding. The following “2030 Climate and Energy Framework” builds on the preceding framework and upgrades and updates the EU’s emissions reduction and energy targets for the period from 2021 to 2030: at least 55% cuts in GHGs compared to 1990 levels (implemented by the EU ETS and ES and the LULUCF Regulation), a 32% share for renewable energy and a 32.5% improvement in energy efficiency (under the “Clean energy for all Europeans package”, consisting of eight legislative acts, including those on renewable energy and energy efficiency, and the new ‘Governance Regulation’).⁵ Besides these increasing

3 Respectively: ETS Dir. 2018/410 (amending Dir. 2003/87); ES Reg. 2018/842 (amending Reg. 525/2013 and Decision 406/2009); LULUCF Reg. 2018/941 (amending Reg. 525/2013 and Decision 529/2013).

4 Including the EU ETS Dir., the Effort Sharing (ES) Reg., and the Renewable Energy Dir. (2009/28) and Efficiency Dir. (2012/27). See https://ec.europa.eu/clima/policies/strategies/2020_en.

5 Energy Performance in Buildings Directive (2018/844); Renewable Energy Dir. (2018/2001); Energy Efficiency Dir. (2018/2002); Governance of the Energy Union and Climate Action Reg. (2018/1999); Electricity Reg. (2019/943); Electricity Dir. (2019/944); Risk Preparedness Reg.

targets, major differences between the 2020 and the 2030 frameworks relate to: the shift of renewable energy binding targets from Member States to an overall EU target, seen as a sign of a more intergovernmental and ‘renationalized’ phase compared with the previous one, which had benefitted from the strong endorsement of Member State leaders and elites (e.g. UK and Germany) convinced of the necessity of an ambitious EU climate change mitigation policy;⁶ the integrated framework for climate and energy planning, reporting and reviewing under the new Governance Regulation (*infra*) as an important driver of cooperation, coordination and convergence overseen by the Commission;⁷ and the integration of the LULUCF sector into the EU’s Climate and Energy Policy Framework, which had not previously been covered.⁸ In particular, the 2030 Framework, while abandoning former national binding targets for renewable energy (a compromise with those Member States opposed to binding national targets), which are thus no longer enforceable through infringement procedures, it nonetheless strengthens Member States’ reporting obligations and the European Commission’s powers to monitor and promote implementation under the Governance Regulation, thus counterbalancing the loss.⁹ In particular, the Governance Regulation establishes common rules for planning, reporting and monitoring integrated national energy and climate plans, and national long term strategies (including total GHG emissions reductions and enhancements of removals by sinks; emissions reductions and enhancements of removals in individual sectors, including electricity, industry, transport, the heating and cooling and building sectors (residential and tertiary), agriculture, waste and land use, land-use change and forestry). Overall, the 2030

(2019/941); ACER Reg. (2019/942). See: https://ec.europa.eu/energy/topics/energy-strategy/clean-energy-all-europeans_en.

- 6 See T. Rayner and A. Jordan, “Climate Change Policy in the European Union”, *supra*; K. Kulovesi and S. Oberthür, “Assessing the EU’s 2030 Climate and Energy Policy Framework: Incremental Change toward Radical Transformation?”, *Review of European, Comparative & International Environmental Law*, 29 (2020) 151–166.
- 7 See K. Szulecki *et al.*, “Shaping the Energy Union: Between National Positions and Governance Innovation in EU Energy and Climate Policy”, *Climate Policy*, 16 (2016) 548–567; M. Ringel and M. Knodt, “The Governance of the European Energy Union: Efficiency, Effectiveness and Acceptance of the Winter Package 2016”, *Energy Policy*, 112 (2018) 209–220.
- 8 See A. Savaresi *et al.*, “Making Sense of the LULUCF Regulation: Much Ado about Nothing?”, *Review of European, Comparative & International Environmental Law*, 29 (2020) 212–220.
- 9 See S. Oberthür, “Hard or Soft Governance? The EU’s Climate and Energy Policy Framework for 2030”, *Politics and Governance*, 7 (2019) 17–27; A. Monti and B. Martinez Romera, “Fifty Shades of Binding: Appraising the Enforcement Toolkit for the EU’s 2030 Renewable Energy Targets”, *Review of European, Comparative & International Environmental Law*, 29 (2020) 221–231.

Framework can be seen as an incremental rather than a radical transformation compared with the 2020 Package, and more efforts are needed to further strengthen EU climate legislation before 2030.¹⁰

More recently, the European Climate Law¹¹ entered into force to turn the political commitment to a climate-neutral economy by 2050 (included in the “European Green Deal Communication”)¹² into a legal obligation. In addition, it adopted the “Fit for 55” Package to revise key EU policies and legislative acts across various sectors, including energy, transport and building, and align these with the new 2030 climate target of “at least 55% GHG reductions” and the 2050 climate-neutrality objective.¹³ The process is ongoing and in addition to existing legislation also concerns new proposals, such as the Carbon Border Adjustment Mechanism to protect EU industry from carbon leakage from production among regions.¹⁴

Thanks to the aforementioned commitments, since 1990, total GHG emissions in the EU-27 plus the United Kingdom¹⁵ have decreased by 1,330 million tonnes of CO₂ equivalent (CO₂e). The EU-28 emitted 4,392 million tonnes of CO₂e in 2018, which is 23.2 % less than in 1990.¹⁶ The decrease in emissions (for the period 1990–2018) was recorded for almost all sectors of the economy with

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- 10 See K. Kulovesi and S. Oberthür, “Assessing the EU’s 2030 Climate and Energy Policy Framework”, *supra*.
- 11 Regulation (EU) 2021/1119 establishing the framework for achieving climate neutrality and amending Regulations (EC) 401/2009 and (EU) 2018/1999.
- 12 Communication from the Commission “European Green Deal”, COM (2019) 640 final.
- 13 See Commission Work Programme 2021 “A Union of vitality in a world of fragility”, COM (2020) 690 final; and the most recent “Fit for 55” Package, published in July 2021, COM (2021) 550 final.
- 14 “Proposal for a Regulation establishing a carbon border adjustment mechanism”, COM (2021) 564 final.
- 15 Following the UK’s departure from the EU on 31 January 2020, the EU and the UK entered a transition period (which ended on 31 December 2020) as agreed on the basis of the Withdrawal Agreement and the Political Declaration published in the Official Journal of the EU on 12 November 2019. EU law applied in the UK until the end of this period. Key provisions of Regulation (EU) No 525/2013 (*Mechanism for Monitoring and Reporting GHG emissions*) applied to the UK with respect to GHG emitted in 2019 and 2020. Following the transition period, the EU UK Trade and Cooperation Agreement entered into force on 1 May 2021 and, together with the Withdrawal Agreement and its Protocols, provides the framework for present EU relations with the UK.
- 16 For an overview of the different GHG emission estimates published regularly by bodies of the EU, available at <https://www.eea.europa.eu/themes/climate/different-emission-estimates/emission-estimates-produced-by-eu>. See, in particular: European Environment Agency (EEA), *Annual European Union Greenhouse Gas Inventory 1990–2018 and Inventory Report 2020* (EEA 2020).

the exception of domestic transportation (where growing demand outpaced improvements in efficiency). The energy supply sector (i.e., heat and electricity generation) was and is by far the biggest source of GHG emissions, followed by the industry, transport, agriculture, residential and commercial (i.e., from buildings) sectors.¹⁷ A number of causes have contributed to this sectorial development, such as the importance of various EU and national policies (especially agricultural and environmental policies in the 1990s, and climate and energy policies from the year 2000 onwards),¹⁸ a strong increase in the use of renewable sources of energy (highly supported by some Member States, in particular by the Nordic countries and Germany),¹⁹ which is expected to rise further as a result of economic stimulus programmes that focus on achieving a sustainable economic recovery from the Covid-19 crisis, as well as the ongoing switch from coal to natural gas (especially in some Member States, and former Member States, such as the UK),²⁰ higher energy efficiency, and

17 *Trends and Drivers of EU Greenhouse Gas Emissions* (EEA 2020). Detailed information relating to the GHG emissions by single Member States is available at <https://www.eea.europa.eu/countries-and-regions>.

18 *Overview of Reported National Policies and Measures on Climate Change Mitigation in Europe in 2019* (ETC/CME 2019), available at <https://www.eionet.europa.eu/etc/cme/products/etc-cme-reports/etc-cme-report-5-2019-overview-of-reported-national-policies-and-measures-on-climate-change-mitigation-in-europe-in-2019>.

19 Germany has adopted particularly ambitious renewable energy targets, especially since the Fukushima nuclear accident and the implementation of the so-called *Energiewende*, a transition to a nuclear-free and low-carbon energy system. UK electricity generation from fossil fuels has also halved since 2010 thanks to the rise in renewables. See <https://www.carbonbrief.org/analysis-uk-renewables-generate-more-electricity-than-fossil-fuels-for-first-time>. Other Member States that have undertaken a strong switch to renewables are Denmark, Finland and Sweden. See *Fostering Effective Energy Transition* (World Economic Forum 2021), available at <https://www.weforum.org/projects/fostering-effective-energy-transition>.

20 Natural gas has been a major driver in Europe's rapid transition away from coal power, for example in the UK, and it has more recently been named as a substantial back-up and balancing source for the development of a renewable energy and electricity system. See the joint paper "The role of natural gas in a climate-neutral Europe", signed by Bulgaria, Czech Republic, Greece, Hungary, Lithuania, Poland, Romania, and Slovakia in 2020 (available at <https://www.euractiv.com/section/energy-environment/news/exclusive-eight-eu-states-back-natural-gas-in-net-zero-transition/>). However, some other Member States, including Denmark and Spain, have warned Brussels not to weaken its initial plan to deny gas a green label. More recently, on 2 February 2022, the European Commission adopted a Complementary Climate Delegated Act, listing specific gas and nuclear activities as "environmentally sustainable" for purposes of the EU Taxonomy Regulation, subject to strict criteria.

structural changes to the economy (favouring services rather than carbon-heavy industries).

The Covid-19 pandemic, though incidental, has had major consequences in terms of achieving 2020 targets, as the economic downturn in 2020 sharply reduced emissions and overall energy consumption, with the share of energy consumed from renewable sources likely having increased thereby securing achievement of the EU's climate and energy goals for 2020.²¹ However, continuing at the rate achieved between 1990 and 2019 would require additional efforts to remain on track for the 2030 and 2050 objectives. The 2020 progress assessment submitted by the European Environment Agency (EEA) reinforces the urgency of revising the abovementioned key EU policies and legislative acts.²²

More recently, a major (unexpected) uncertainty appears to be jeopardizing the EU's energy transition process and at the same time reinforcing the need to revise energy and climate policies in line with the European Green Deal's ambitious goals. The invasion of Ukraine by Russia has made EU's energy dependence clear. Overall, the EU's dependence on energy imports has increased in recent years due to lower domestic production of non-renewable energy (coal, gas, oil and nuclear), combined with stable energy demand. In 2020, the EU imported about 57.5% of its energy, of which 97% of oil and petroleum products, 83.6% of natural gas, and 35.8% of solid fossil fuels.²³ With the Green Deal, the EU has already implicitly taken steps to reduce this dependency – albeit over a long period. However, natural gas is regarded as a necessary source of energy for the transition period, as it is cleaner than coal and provides a flexible buffer in case of a shortfall in renewable energy. Given potentially continuing uncertainty over Russia's oil and gas supplies to the EU Member States, the EU needs to accelerate its supply diversification and its energy independence. This likely implies a short-term and temporary deviation from purely climate change-related considerations in the interests of finding a structural solution to EU's energy security. Conversely, in the medium and longer term, the goals of the European Green Deal coincide with those related to the EU's energy security, thus the 2050 climate neutrality target of the EU should be on track.

21 See *Trends and Projections in Europe 2020. Tracking Progress towards Europe's Climate and Energy Targets* (EEA 2020).

22 *Ibid.*

23 See EU energy statistics on EUROSTAT: https://ec.europa.eu/eurostat/statistics-explained/index.php?title=Energy_statistics_-_an_overview.

2.2 *EU Adaptation Policies and Targets*

The current and predicted impacts of climate change within the EU vary by region.²⁴ While Southern and Central Europe is expected to face increased temperatures, heat waves, more frequent forest fires and droughts, Northern Europe will face increased precipitation, possibly leading to winter floods becoming more common. Sectors of the economy that strongly rely on certain temperatures and precipitation levels, such as agriculture, forestry, energy and tourism, will be particularly affected. Coastal areas and floodplains in Western Europe are also threatened by rising sea levels and increasing storm surges.²⁵ In 2013, the European Commission adopted the *EU Strategy on adaptation to climate change*²⁶ to make the EU more climate resilient. Three priorities have been identified: the promotion of action on the part of Member States, the creation of better information for decision-making and the protection of key vulnerable sectors (agriculture and fisheries), while the Cohesion Policy is indicated as a key instrument to promote the required adaptation measures. Nonetheless, the evaluation report of the Strategy²⁷ called for more actions to implement adaptation at Member State level, as greater magnitude and frequency of extreme weather events were expected to impact on several relevant sectors, such as energy, agriculture, fisheries, infrastructure, and tourism. Building on the 2013 Climate Change Adaptation Strategy and its evaluation report, the European Commission adopted a new Strategy on adaptation²⁸ in February 2021 to reinforce the adaptive capacity of the EU and to meet present and future challenges. The new Strategy links directly to the European Climate Law and recent global agreements.

Unlike EU mitigation policies, the EU initiative on adaptation only encourages Member States, regional and local levels to take action, rather than mandating it, as the EU lacks formal competence and authority in a variety of areas related to adaptation.²⁹ Thus, cooperation among Member States

24 See *Climate Change Impacts in Europe* (EEA 2020), available at <https://www.eea.europa.eu/themes/climate-change-adaptation/impacts-vulnerability-and-risks>.

25 *Climate Change, Impacts and Vulnerability in Europe 2016*, Report 15/2017 (EEA 2017). See also *National Climate Change Vulnerability and Risk Assessments in Europe*, Report 1/2018 (EEA 2018).

26 COM (2013) 216 final, available at <https://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=COM:2013:0216:FIN:EN:PDF>.

27 Commission Staff working document, "Evaluation of the EU Strategy on Adaptation to Climate Change", 2018 (SWD (2018)461).

28 European Commission Communication, *Forging a Climate-Resilient Europe – The New EU Strategy on Adaptation to Climate Change*, COM (2021) 82 final.

29 See A. Fleig *et al.*, "Legislative Dynamics of Mitigation and Adaptation Framework Policies in the EU", *European Policy Analysis*, 3 (2017) 101–124.

and coordination with the EU play a prominent role here. The European Commission, in particular, provides financial assistance to Member State adaptation initiatives, monitors and assesses national adaptation strategies, and supports the Member States and their government levels through the European Climate Adaptation Platform (Climate-ADAPT),³⁰ which allows for the exchange of data, best practices and information.

3 The Multilevel Dynamics Influencing EU Climate Governance

The EU's institutional architecture is mainly based on two orders of government, i.e., the EU and the Member States, while Member States' regional and local levels of government are increasingly gaining institutional representation at EU level, e.g., through the Committee of the Regions and through other specific climate and energy forums, such as the Covenant of Mayors (*infra*). In fact, the European Commission has progressively sought territorial collaborators and partnerships, thus increasing the salience of the regional and local levels, and creating direct links between these and the EU, especially in the implementation of spatial policies. In addition, it has sought to incorporate regions into the policy process, both to increase policy effectiveness and to enhance its visibility and legitimacy at the sub-state level.³¹

The institutional architecture and climate policies of the EU reflect this mix of decentralized and flexible approaches, in addition to cooperative and supranational coordination elements, and presents both opportunities and challenges as illustrated by the following examples, both in the mitigation and adaptation fields.

With regard to mitigation policy, several Member States have anticipated and influenced the EU's climate initiative, and consequently that of other Member States, thereby pushing European climate mitigation policy forward while at the same time gaining credit for their actions domestically, for instance by establishing governance frameworks with a long-term outlook through the adoption of national climate laws, also referred to as 'flagship laws'.³² Amongst these, though now a former EU Member State, the UK's Climate Change Act,³³

30 See <https://climate-adapt.eea.europa.eu/about>.

31 See M. Keating, "Europe as a Multilevel Federation", *Journal of European Public Policy*, 24 (2017) 615–632.

32 See S. Fankhauser, C. Gennaioli and M. Collins, "The Political Economy of Passing Climate Change Legislation: Evidence from a Survey", *Global Environmental Change*, 35 (2015) 52–61.

33 Revised in 2019.

adopted in 2008, was considered pioneering and to have inspired a range of related national framework laws and draft laws, although the Paris Agreement may have accelerated this rationale.³⁴ Emulation was a major mechanism shaping climate framework laws developed in other Member States after the UK example.³⁵

Some other Member States' autonomous initiatives in this field may have followed their own strong incentives either anticipated or led by the EU's more ambitious objectives and targets. In any case, most Member States' national mitigation policies and measures have been implemented in response to both EU strategies and binding instruments.³⁶ In particular, two main types of initiative have been undertaken by Member States under the umbrella of the EU's climate mitigation action: economic policy instruments (such as subsidies or tariffs), which account for 44% of total measures undertaken, and regulatory instruments (e.g., energy efficiency standards), which cover about 43% of all actions, both targeting energy emissions.³⁷ According to national reports,³⁸ national mitigation actions are mostly related to the following EU instruments: the 2009 Renewable Energy Directive, the 2012 Energy Efficiency Directive, the Effort Sharing Decision, the 2006 Energy End-use Efficiency and Energy Services Directive, and the 2010 recast of the Energy Performance of Buildings Directive. Only 27% of all reported national actions³⁹ are not directly related to a specific EU policy or legislation.

Following the EU's initiative, Member States have adopted climate mitigation policies and legislation of varied ambition, taking advantage of the flexibility of policy instruments and EU binding instruments on mitigation (i.e., directives binding Member States as to the results to be achieved, but leaving

34 See M. Duwe and N. Evans, *Climate Laws in Europe: Good Practices in Net-Zero Management* (Ecologic Institute 2015), available at <https://www.ecologic.eu/17233>.

35 See N. Meyer-Ohlendorf, *A European Climate Law – Analysis of the European Commission Proposal* (Ecologic Institute 2020); N. Evans and M. Duwe, *Climate Governance Systems in Europe: The Role of National Advisory Bodies* (Ecologic Institute and IDDRI 2021), available at <https://www.ecologic.eu/18093>.

36 *Overview of Reported National Policies and Measures on Climate Change Mitigation in Europe in 2019* (European Topic Centre on Climate Change Mitigation and Energy 2019), available at <https://www.eionet.europa.eu/etcs/etc-cme/products/etc-cme-reports/etc-cme-report-5-2019-overview-of-reported-national-policies-and-measures-on-climate-change-mitigation-in-europe-in-2019>.

37 *Ibid.*, at 2.

38 Reports by Member States to the European Environment Agency (EEA) under the EU Monitoring Mechanism Regulation (2019).

39 *Overview of Reported National Policies and Measures on Climate Change Mitigation in Europe in 2019, supra*, at 3.

margins for maneuver as to the form and means of implementation) as well as the autonomy of Member States in the energy field. Thus, there are diverging timelines in adopting mitigation measures as well as implementation variances across Member States;⁴⁰ besides, data on the effectiveness of various types of measures set by Member States are still lacking, especially concerning an *ex-post* evaluation of GHG emissions reductions.⁴¹ In particular, as Member States hold a high degree of autonomy (thanks to the subsidiarity and sovereignty clauses)⁴² in relation to energy policies, EU mitigation policies do not convey such a coherent, homogeneous and ambitious approach as might be expected, for instance on the basis of the EU's climate change leadership aspiration.⁴³ Especially as a result of the problematic 2004 enlargement to include former communist central and Eastern countries, the EU's mitigation policy ambition has at times been limited, as further explained by the following examples, and has been only partially reinstated through substantial financial compensations and exemptions.⁴⁴

The Member States' diverging priorities and sometimes conflicting positions, especially with regard to energy and mitigation targets, are reflected in turn in the European Council and the Council of the EU, where Member States' heads of state and government and ministers respectively reaffirm their sovereign priorities, sometimes in contrast with that of the European Commission. Notably, some newer Member States have become increasingly assertive in more recent years, expressing their opposition to strengthening EU mitigation policy, reflected in a reduction of the EU's internal cohesion and less ambitious mitigation target setting.⁴⁵ For instance, in the European Council of June

40 See A. Fleig *et al.*, "Legislative Dynamics of Mitigation and Adaptation Framework Policies in the EU", *supra*.

41 *Overview of Reported National Policies and Measures on Climate Change Mitigation in Europe in 2019*, *supra*.

42 Treaty on European Union (TEU), art. 5.

43 See J. Gupta and L. Ringius, "The EU's Climate Leadership: Reconciling Ambition and Reality", *International Environmental Agreements: Politics, Law and Economics*, 1 (2001) 281–299; C. Parker and C. Karlsson, "Climate Change and the European Union's Leadership Moment: An Inconvenient Truth?", *Journal of Common Market Studies*, 48 (2010) 923–943; E. Massey *et al.*, "Climate Policy Innovation: The Adoption of Adaptation Policies across Europe", *Global Environmental Change*, 29 (2014) 434–443.

44 See T. Rayner and A. Jordan, "Climate Change Policy in the European Union", *supra.*; K. Kulovesi, and S. Oberthür, "Assessing the EU's 2030 Climate and Energy Policy Framework", *supra*; M. Peeters and N. Athanasiadou, "The Continued Effort Sharing Approach in EU Climate Law: Binding Targets, Challenging Enforcement?", *Review of European, Comparative & International Environmental Law*, 29 (2020) 201–211.

45 See T. Rayner and A. Jordan. "Climate Change Policy in the European Union", *supra*.

2019, Poland, Hungary, Slovakia and the Czech Republic, the so-called *Visegrad Group*, opposed the proposed target of zero emissions, thus hampering a 2050 carbon neutrality target for the EU. The *Visegrad Group*, dominated by fossil fuel energy programmes, presents divergent interests and preferences compared to other Member States, such as those forming the *Green Growth Group*.⁴⁶ A more recent example of diverging Member States' interests and positions is provided by the Council of October 2020, which was forced to postpone the agreement on a new emissions target for 2030 (strongly supported by the Commission, the EU Parliament and the *Green Growth Group*) and the submission of the EU's updated NDC to the UNFCCC, to December 2020.⁴⁷

As energy production and energy use account for 79% of the EU's GHG emissions, the EU's mitigation actions are heavily affected by how energy policies are implemented by Member States and by their choices of energy sources.⁴⁸ Thus, ongoing sovereignty-based clashes over energy policies (Herold et al. 2019) are hindering the EU's mitigation aspirations to some extent.⁴⁹

To reconcile these opposing positions and negotiate a pan-EU climate change mitigation goal, the strategy that EU institutions seem to pursue is based on collective action, where all Member States participate in mitigation efforts, albeit taking into account national circumstances and considerations of fairness and solidarity. This approach has been applied in numerous European instruments, such as EU legislation (e.g., EU ETS, Effort Sharing), specific financial mechanisms (e.g. the Modernisation Fund, supporting investments for a just transition in carbon-dependent regions in 10 lower-income Member States),⁵⁰ financial assistance through existing funding schemes (e.g. structural and investments funds)⁵¹ and instruments combining research, innovation and funding (e.g. Just Transition Platform, NER 300 programme). The latter create

46 The *Green Growth Group* consists of the following EU Member States (Belgium, Denmark, Estonia, Finland, France, Germany, Italy, Luxembourg, the Netherlands, Portugal, Slovenia, Spain, Sweden and the UK) plus Norway, which have been collaborating since 2014 to make EU climate policy more ambitious and sustainable.

47 European Council Conclusions on Covid-19 and climate change, 15 October 2020.

48 See European Court of Auditors, "EU action on energy and climate change", Review 1/2017, available at publications.europa.eu/webpub/eca/lr-energy-and-climate/en/.

49 See K. Marcinkiewicz and J. Tosun, "Contesting Climate Change: Mapping the Political Debate in Poland", *East European Politics*, 31 (2015) 187–207; K. Szulecki et al., "Shaping the Energy Union", *supra*.

50 The beneficiary Member States are Bulgaria, Croatia, Czech Republic, Estonia, Hungary, Latvia, Lithuania, Poland, Romania and Slovakia. See https://ec.europa.eu/clima/policies/budget/modernisation-fund_en.

51 See <https://ec.europa.eu/info/funding-tenders/funding-opportunities/funding-programmes/overview-funding-programmes/european-structural-and-investment-funds/en>.

networks through which Member States, regions, agencies and stakeholders exchange information and knowledge, best practices and specific assistance to meet collective targets.

In sum, although some national sovereignty assertion over energy transition continues to hinder not only the integration of European energy policies and the Energy Union, but also the coherence and effectiveness of European mitigation action,⁵² the package of flexible instruments described above constitutes a sound attempt to contrast the problematic 2004 enlargement of the EU with regard to energy governance fragmentation and increasingly difficult intergovernmental decision-making in climate policy.⁵³ Moreover, over time the Commission has enabled and built on multiple dynamics (both vertical and horizontal) to exert increasing influence over ambitious mitigation actions. This multi-level and multi-sectoral approach targets industries, mobilizes economic interests, and involves sub-national authorities and domestic stakeholders across levels of governments.⁵⁴ It has empowered EU mitigation policies by linking European goals directly to domestic and local support and industry interests for climate-friendly technologies. To this extent, the “Europe 2020” Strategy,⁵⁵ the “2020 Climate and Energy Package” and the “2030 Climate and Energy Framework” have put special emphasis on strengthening the interconnections among industrial sectors and the research community through financial resources and specific funding programmes (e.g., NER 300 and NER 400; Innovation Fund and Modernisation Fund),⁵⁶ aimed at EU low-carbon objectives.

To this same end, as mentioned, the European Commission has pushed for a greater emphasis on regional and local governments in tackling mitigation. In particular, in 2008 the European Commission, with support from the Committee of the Regions, launched the *EU Covenant of Mayors* initiative⁵⁷

52 M. de la Esperanza Mata Pérez, D.J. Scholten and K. Smith Stegen, “The Multi-Speed Energy Transition in Europe: Opportunities and Challenges for EU Energy Security”, *Energy Strategy Reviews*, 26 (2019) 1–6.

53 See T. Rayner and A. Jordan, “Climate Change Policy in the European Union”, *supra*.

54 See J.J. Wettestad, P.O. Eikeland and M. Nilsson, “EU Climate and Energy Policy: A Hesitant Supranational Turn”, *Global Environmental Politics*, 12 (2012) 67–86; K. Szulecki *et al.* “Shaping the Energy Union”, *supra*.

55 European Commission, *Europe 2020: A Strategy for Smart, Sustainable and Inclusive growth*, COM (2010) 2020.

56 See respectively https://ec.europa.eu/clima/policies/innovation-fund/ner300_en; <http://ner400.com/>; https://ec.europa.eu/clima/policies/innovation-fund_en; https://ec.europa.eu/clima/policies/budget/modernisation-fund_en.

57 See <https://www.covenantofmayors.eu/about/covenant-initiative/origins-and-development.html>.

with the aim of engaging regional and local levels in the implementation of the EU's climate mitigation and energy targets. Over the years, this became a well-established network of local governments voluntarily committed to implementing EU climate and energy objectives. In particular, signatory cities and towns commit to actively support the implementation of the EU's GHG-reduction target by 2030 by submitting energy and climate action plans⁵⁸ and taking actions in those policy areas directly influenced by local administration, such as the buildings sector, urban transport and local energy production. Furthermore, the European Commission has recognized the role of Member States' provincial and regional government levels as *Covenant Territorial Coordinators* (CTCs), key in supporting municipalities with strategic guidance, financial aid (e.g., through ERDF – European Regional Development Fund – and the Cohesion Fund) and technical support. The CTCs promote coordinated action among municipalities at a higher administrative level (e.g., provincial and regional) and, in some cases, compensate for the void left by the national level, such as in the absence of frameworks for local energy planning. Thus, these local-level initiatives, supported by the European Commission, play an important role in reinforcing mitigation policies in some Member States (e.g., Germany, Denmark, the UK) and in filling gaps in others with weaknesses at national level (e.g., Poland).⁵⁹

The same drivers and dynamics described above apply to adaptation policies. In this field several EU Member States adopted strategies and framework legislation including provisions on adaptation earlier than the EU.⁶⁰ The increasing costs and damages associated with more frequent extreme weather events, such as floods, storms and heatwaves recorded in Member States, and an increase in public awareness and attention,⁶¹ led to these early

58 Sustainable Energy Action Plans (SEAP) and Sustainable Energy and Climate Action Plans (SECAP), including climate risk assessments (and adaptation measures).

59 See M. Jänicke and R. Quitzow, "Multi-Level Reinforcement in European Climate and Energy Governance: Mobilizing Economic Interests at the Sub-National Levels", *Environmental Policy and Governance*, 27 (2017) 122–136.

60 The following Adaptation Strategies were adopted earlier than the EU Strategy: Finland (2005); Spain and France (2006); Denmark, Hungary, Netherlands, UK and Germany (2008); Sweden (2009); Belgium (2010); Lithuania and Ireland (2012). Climate Change Acts including adaptation measures were adopted, for instance, by Finland (2015) and Denmark (2019). See EEA <https://www.eea.europa.eu/airs/2016/environment-and-health/climate-change-adaptation-strategies>.

61 See I. Lorenzoni and M. Hulme, "Believing Is Seeing: Laypeople's Views of Future Socio-Economic and Climate Change in England and in Italy", *Public Understanding of Science*, 18(2009) 383–400.

moves. In addition, according to some scholars,⁶² the diffusion of adaptation policies and laws in other ‘laggard’ and ‘waiver’ countries has been observed as a “Nordic-country effect”: in other words, the early adoption of such laws in Nordic countries has affected the diffusion of adaptation frameworks to other EU Member States. In the EU context, peer behavior has been quite influential thanks to the spread of ideas, practices and institutions.⁶³

However, the steady increase between 2013 and 2018 of national adaptation strategies and plans in the EU Member States⁶⁴ was strongly influenced by the EU Adaptation Strategy, adopted by the Commission and endorsed and agreed by the European Council and the Parliament. In fact, the EU initiative has catalyzed action in Member States, and particularly in those that were in the earlier stages of developing an adaptation policy. The EU’s facilitative role, through providing guidance, funding research and adaptation action under the Strategy, has urged and enhanced Member State initiatives.⁶⁵ In central and Eastern EU Member States in particular, some policy studies have shown that the most important driver for diffusion of adaptation measures was the EU’s effort to put adaptation on the agenda and accompanying financial support.⁶⁶ In any case, the EU’s efforts to promote adaptation across Member States have intensified in recent years, for instance by establishing mechanisms of knowledge-sharing and best practices-exchange among public and private stakeholders (i.e., through the Climate-Adapt Platform), by the involvement of local governments in adaptation initiatives on the basis of voluntary commitments, and by financial support through existing European funds (e.g., the EU’s Solidarity Fund). In this respect, EU funds play an important role as there is a lack of funding, with only half of Member States⁶⁷ having budgets attached to their adaptation instruments (i.e., National Adaptation Strategies, NAS, and National Adaptation Plans, NAP).⁶⁸

62 See A. Fleig *et al.*, “Legislative Dynamics of Mitigation and Adaptation Framework Policies in the EU”, *supra*; D. Russel *et al.*, “Policy Coordination for National Climate Change Adaptation in Europe: All Process, but little Power”, *Sustainability*, 12 (2020) 1–18.

63 See E. Massey *et al.*, “Climate Policy Innovation”, *supra*.

64 European Commission, *Evaluation of the EU Strategy on Adaptation to Climate Change*, SWD (2018) 461 final, available at <https://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=SWD:2018:461:FIN&from=EN>.

65 See E. Massey and D. Huitema, “The Emergence of Climate Change Adaptation as a New Field of Public Policy in Europe”, *Regional Environmental Change*, 16 (2016) 553–564.

66 See E. Massey *et al.*, “Climate Policy Innovation”, *supra*.

67 *Ibid.*

68 *National Adaptation Strategies* (NASs) address overarching issues, recognise the importance of expected climate change impacts and the need to adapt, and facilitate the process of coordinating the adaptation response, increasing awareness of adaptation and

As already observed for mitigation policy, an additional factor fostering adaptation action in Member States is the involvement of subnational levels. Vertical coordination among European, national, regional and local authorities is essential, as current financial and knowledge gaps at local level may hinder local action. However, systematic coordination across all levels of administration has only been observed in some Member States, while gaps in the involvement of subnational governance levels has been detected in some others.⁶⁹ In 2014, the European Commission launched a separate initiative called *Mayors Adapt*, based on the *EU Covenant of Mayors* experience described above, with the aim of engaging cities to take action to adapt to climate change, either by developing comprehensive adaptation strategies or by integrating adaptation to climate change into their relevant existing plans. In 2015, the two initiatives officially merged into the *Covenant of Mayors for Climate & Energy* in 2015⁷⁰ and now represent successful experiences⁷¹ of vertical (local and regional linking to national/EU levels) and horizontal (e.g., national and transnational city networking, learning and best practices sharing) collaboration for mitigation and adaptation actions. At local level, involvement in the EU Covenant of Mayors for Climate and Energy has proven to be a sound mechanism in promoting city-level adaptation policymaking and in linking EU strategy to local action.⁷²

In this realm, transnational cooperation among Member States (plus third countries) has also increased with the recognition of the importance of adaptation as a cross-cutting policy area. EU-driven transboundary adaptation action is channeled through four macro-regional strategies,⁷³ thus involving

stakeholder involvement, assessing risks and vulnerabilities, and identifying knowledge gaps. *National Adaptation Plans* (NAPs) implement NASS and organise activities for achieving their objectives, typically through sectoral implementation.

69 Commission Staff Working Document, *Adaptation preparedness scoreboard – Country fiches: Accompanying the document Report from the European Commission to the European Parliament and the Council on the implementation of the EU Strategy on adaptation to climate change* (SWD(2018)460 final).

70 See <https://www.covenantofmayors.eu/about/covenant-initiative/covenant-in-figures.html>.

71 The latest overall assessment of the initiative shows that the signatories' commitment to reducing GHG emissions is 27% by 2020, i.e., 7% above the requested target of 20%. See A. Kona *et al.*, "Covenant of Mayors Signatories Leading the Way Towards 1.5 Degree Global Warming Pathway", *Sustainable Cities and Society*, 41 (2018) 568–575.

72 See S. Grafakos *et al.*, "Integration of Mitigation and Adaptation in Urban Climate Change Action Plans in Europe: A Systematic Assessment", *Renewable and Sustainable Energy Reviews*, 121 (2020) 1–20.

73 A "macroregional strategy" is an integrated framework to address common challenges faced by a defined geographical area relating to Member States and third countries located in the same geographical area, which thereby benefit from strengthened cooperation

most of the Member States. For instance, the EU Strategy for the Danube Region emphasizes adaptation to extreme weather events and provides an important platform to foster cooperation between several Member States, i.e., Austria, Croatia, Bulgaria, the Czech Republic, Germany, Hungary, Romania, Slovakia and Slovenia, and also encompassing some neighboring countries, on joint monitoring and flood management. At the same time, this cooperation facilitates the collective implementation of existing EU Directives, e.g., the Water Framework Directive (2000/60) and the Floods Directive (2007/60), and sectoral policy which, in turn, contribute to efforts for adaptation to climate change with regard to water issues. Finally, the existence of an international river basin committee, i.e., the International Commission for the Protection of the Danube River, under which a specific adaptation strategy was adopted in 2012,⁷⁴ also fosters joint climate adaptation actions in Member States. This case is replicated in the other European macro-regions with regard to other sectoral policies and related adaptation initiatives. For instance, in addition to extensive transboundary cooperation on river basins, multiple initiatives addressing adaptation to climate change exist for mountain ranges and for biodiversity (e.g., the Alpine space).⁷⁵

These examples clearly illustrate the process of mainstreaming adaptation action into the EU's policies at different levels, by supporting environmental policy integration practices across multiple scales,⁷⁶ and the process of multi-level reinforcement of policy action in the EU climate change adaptation field. Nevertheless, some policy sectors, such as marine and coastal policy, receive less attention in terms of adaptation mainstreaming despite being singled out as priorities in the EU Adaptation Strategy, and do not follow these virtuous dynamics. This is mainly because of conflicting Member State agendas and preferences. An example here is Germany, which has strongly opposed any policy action affecting marine and coastal planning issues from the European

contributing to the achievement of economic, social and territorial cohesion. The EU macroregional strategies are the EU Strategy for the Baltic Sea Region, the EU Strategy for the Danube Region, the EU Strategy for the Adriatic and Ionian Region and the EU Strategy for the Alpine Region. See http://ec.europa.eu/regional_policy/en/policy/cooperation/macro-regional-strategies/.

74 See <https://www.icpdr.org/main/climate-adaptation-strategy-adopted>.

75 See <https://climate-adapt.eea.europa.eu/countries-regions/transnational-regions/alpine-space>.

76 See A. Jordan and A. Lenschow, "Policy Paper Environmental Policy Integration: A State of the Art Review", *Environmental Policy and Governance*, 20 (2010) 147–158; V. Heyvaert, "What's in a Name? The Covenant of Mayors as Transnational Environmental Regulation", *Review of European, Comparative & International Environmental Law*, 22 (2013) 78–90.

Commission.⁷⁷ On the contrary, some other Member States, i.e., those belonging to the Mediterranean area, share a common understanding and urgency of climate change impacts and adaptation needs and are more supportive of EU adaptation mainstreaming into sectoral policies and across different levels. In addition, gaps at national and subnational levels in introducing adaptation considerations in certain sectors are still relevant. Only a few Member States have national policy instruments that promote adaptation at sectoral level, in line with national priorities and in areas where adaptation is mainstreamed in EU policies.⁷⁸

4 Conclusion

Overall, the EU climate governance has been shaped over the years in a dynamic and progressive manner, leading to ambitious policies and targets despite the hindrance of conflicting Member States' positions and priorities, a burdensome enlargement process, and still uncountable uncertainties in the wake of Brexit and the post-Covid-19 economic crisis, not to mention the uncertain economic and political consequences of Russia's recent invasion of Ukraine on its energy and climate policies.

The institutional structure of the EU has played a major role in the creation, circulation and development of climate mitigation and adaptation policies, providing an arena in which leadership could be exerted at multiple levels and multiple times, by fostering experimental and innovative solutions (e.g., the EU ETS), and triggering numerous horizontal and vertical forums for mutual learning and support.

The data and examples provided in the previous sections reinforce the idea that the EU's multi-level governance framework has played a positive role in both the mitigation and in the adaptation fields in terms of social influence, knowledge sharing, financial assistance mechanisms, capacity building and collaboration among research and administrative networks to tackle the challenges of climate change. Thus, existing weaknesses should be seen as opportunities for all government tiers.

A number of mechanisms (e.g., regulatory instruments, multi-level forums and funds) and sufficient flexibility exist to overcome the current drawbacks

77 See D.J. Russel, R.M. den Uyl and L. de Vito, "Understanding Policy Integration in the EU—Insights From a Multi-Level Lens on Climate Adaptation and the EU's Coastal and Marine Policy", *Environmental Science and Policy*, 82 (2018) 44–51.

78 SWD(2018)460 final, *supra*.

and maintain progress in achieving the ambitious agenda and the targets set by the European Commission with regard to mitigation and adaptation; moreover additional actions could be undertaken as suggested more recently by scholars.⁷⁹ In addition, subnational levels are increasingly and actively supporting and, at the same time, benefiting from and linking to European climate governance, especially with reference to adaptation initiatives, thus serving as an extra connecting stimulus to national and European government levels in a multi-level reinforcement process.

79 See, for instance M. Duwe, *Making EU Climate Governance Fit for Net Zero. An Analysis of the Current Landscape of Relevant EU Climate Policy Processes and Recommendations for Alignment with the Climate Neutrality Objective* (Federal Environment Agency 2022).

Climate Change at Domestic Level

National Powers and Regulations in Italy and Austria

Maria Bertel and Federica Cittadino

1 Introduction¹

As argued in the Introduction to this book, the fight against climate change needs to be mainstreamed in those policies that are connected to it, such as transport, energy and water, and spatial planning, because legislation enacted in those fields may have an impact on mitigation and adaptation objectives.² An additional reason for focusing on climate change integration in sectoral policies is that, as shown in the following, neither Italy nor Austria provide an explicit competence to legislate on climate-related issues. In contrast, these are subsumed *de facto* in other sectoral competences, such as the protection of the environment, water, energy matters, mobility, and land use.

This chapter discusses in section 2 the division of competences between the national and subnational levels in the sectors of environmental protection, transport, energy and water, and spatial planning, both pursuant to the Constitutions of Italy and Austria and with reference to the orientation of the Constitutional Courts of the two countries. Section 3 outlines the main strategies and legislation in the same sectors, with a view to understanding to what extent these integrate climate change in the abovementioned fields of activity. Although national strategies are not accepted sources of law in the systems analyzed, both in Italy and Austria they are usually adopted by the government to set long-term objectives that are in line with both international and EU commitments.

1 In the joint elaboration of this chapter, sections 1, 2.1 and 3.1 have been written by Federica Cittadino, sections 2.2 and 3.2 by Maria Bertel, and section 4 by both. Maria Bertel wishes to thank Marlene Mlekusch for assistance with the redaction of the footnotes in sections 2.2 and 3.2.

2 See Introduction in this volume.

2 Climate Change as a Policy Field in Italy and Austria?

2.1 Italy

The fight against climate change constitutes a specific policy field in the mandate of the new Ministry for Ecological Transition.³ Climate change is not an explicit policy competence under article 117 of the Italian Constitution; rather, it is a policy goal and a policy framework that needs regulations by the competent policy levels in order to be fulfilled.

Italy is a regional state, encompassing ordinary and autonomous regions.⁴ In this framework, article 117, as reformed in 2001,⁵ regulates the division of legislative and administrative competences between the state and the regions and distinguishes between powers that fall within the exclusive competence of the state under article 117(2) and powers that are shared between the state and the regions under article 117(3) of the Italian Constitution (concurring legislation).

3 Created on 26 February 2021 (art. 2–3 d.l. 22/2021) to replace the Ministry for Environmental Protection, whose mandate previously included climate change. The CREIAMO PA initiative establishes within the mandate of the Ministry specific priorities on climate change adaptation, water resources, and sustainable mobility. See <https://www.mite.gov.it/pagina/creiamo-pa-competenze-e-reti-l-integrazione-ambientale-e-il-miglioramento-delle>. All hyperlinks in this chapter were last accessed on 31 October 2022.

4 Art. 114 and 116 of the Italian Constitution. For an account of the differences between ordinary regions and autonomous regions, see L. Antonini, *Il regionalismo differenziato* (Giuffrè 2000); R. Bin and G. Falcon (eds.), *Diritto regionale* (Il Mulino 2019); M. Carli, *Diritto regionale: le autonomie regionali, speciali e ordinarie* (Giappichelli 2020); T. Martines, A. Morelli and A. Ruggeri, *Lineamenti di diritto regionale* (Giuffrè 2019); S. Pajno, “Il regionalismo italiano a vent’anni dalla riforma del Titolo v: prime riflessioni”, *Le Regioni*, 4 (2021) 81–94; L. Vandelli (ed.), *Il governo delle Regioni: sistemi politici, amministrazioni, autonomie speciali* (Il Mulino 2013). See also F. Palermo and S. Parolari (eds.), *Il futuro della specialità regionale alla luce della riforma costituzionale* (ESI 2016).

5 On the reform of Title v of the Italian Constitution, see G. Avolio and F. Palermo (eds.), *La riforma del titolo v, parte seconda, della Costituzione italiana: analisi ed effetti per la Provincia autonoma di Bolzano* (Eurac Research 2004); G. Berti and C. De Martin (eds.), *Le autonomie territoriali: dalla riforma amministrativa alla riforma costituzionale. Atti del convegno di Roma, 9 gennaio 2001* (Giuffrè 2001); E. Bettinelli and F. Rigano (eds.), *La riforma del Titolo v della Costituzione e la giurisprudenza costituzionale. Atti del Seminario (Pavia, 6–7 giugno 2003)* (Giappichelli 2004); B. Caravita, *La Costituzione dopo la riforma del Titolo v: Stato, Regioni e autonomie fra Repubblica e Unione Europea* (Giappichelli 2003). A more recent constitutional reform (approved on 8 February 2022) modified artt. 9 and 41 of the Italian Constitution. Art. 9 now recognizes among Italian constitutional principles “the protection of the environment, biodiversity, and ecosystems, also in the interest of future generations”. It furthermore requires the state to adopt legislation to protect animals without prejudice to the competences of the autonomous regions. Only time will tell whether and how this article will influence the conceptualization of the environment as a policy field.

Climate change is both to be subsumed under the policy field of environmental protection, and is intertwined with other policies, such as transport, energy and water, and spatial planning.

Under the Italian Constitution, these policy matters are subject to different regimes in terms of the allocation of legislative and administrative powers. On the one hand, the protection of the environment and the ecosystem is a policy area where the state exercises exclusive legislative powers (article 117(2)(s)). In line with consolidated jurisprudence of the Italian Constitutional Court, every aspect of environmental protection is included in the exclusive powers of the state, including legislation on water and air pollution.⁶ On the other hand, under article 117(3), “concurring legislation applies to [...] land-use planning; civil ports and airports; large transport and navigation networks; [...] national production, transport and distribution of energy; [...] enhancement of cultural and environmental properties”. In the fields of concurring legislation, the state lays down fundamental principles, while more detailed legislation is to be adopted by regions.⁷ Furthermore, regions, both ordinary and autonomous, hold regional powers in the fields of mineral and thermal waters, water services, and regional and local production, transport and distribution of energy.⁸ In this framework,

6 Concerning water, see Italian Constitutional Court (hereinafter in footnote Corte cost.) 32/2005, 117/2005, 246/2009, 29/2010, 142/2010, 325/2010, 128/2011, 187/2011, 62/2012, 67/2013, 228/2013, 65/2019 and 153/2019. Concerning air pollution, prevention of air pollution and air quality fall within the exclusive competence of the state on environmental protection (e.g. Corte cost. 250/2009, 141/2014). See R. Nevola, *La tutela dell'ambiente, degli ecosistemi e dei beni culturali nei giudizi in via principale di legittimità costituzionale* (Corte Costituzionale 2015), available at https://www.cortecostituzionale.it/documenti/convegni_seminari/stu_279.pdf. The prevention of air pollution was already considered part of environmental protection prior to the constitutional reform of 2001. See Corte cost. 183/1987, 641/1987, although the prevention of air pollution was considered shared between the state and regions (Corte cost. 53/1991, 54/2000). Electromagnetic pollution is a shared competence that falls under health protection but also intersects with energy production where the state should establish framework rules (Corte cost. 307/2003). M. Bellocci and P. Passaglia, *La giurisprudenza costituzionale relativa al riparto di competenze tra Stato e Regioni in materia di «ambiente» e di «beni culturali»* (Corte costituzionale), available at https://www.cortecostituzionale.it/documenti/convegni_seminari/Ambiente_STU_189_1_sitoCorte.pdf.

7 The final part of art. 117(3) reads as follows: “In the subject matters covered by concurring legislation legislative powers are vested in the Regions, except for the determination of the fundamental principles, which are laid down in state legislation”. The translation into English of the Italian Constitution is available at https://www.senato.it/documenti/repository/istituzione/costituzione_inglese.pdf.

8 M. Alberton, *Governi ambientali negli ordinamenti composti. Traiettorie italiane e spagnole tra unità e asimmetria* (ESI 2021), at 107. As we shall see in Chapter 3 in this volume, the

policies on climate change may be adopted by both the central state, and the regions.⁹

Since the abovementioned reform of 2001, the division of competences on environmental matters has generated an increasing number of conflicts, resolved by the Constitutional Court, between the state and the regions concerning the legitimacy of legislative acts adopted to regulate the environment or aspects related to it.¹⁰ This testifies, *inter alia*, to the difficulties with sharply dividing competences that are closely related to or have consequences on the protection of the environment. The same considerations may also apply to the policy objective of climate change, which is embedded in the protection of the environment as well as in related policy fields.

Environmental protection as a transversal subject matter or value-matter (“*materia valore*”)¹¹ has been interpreted as strictly belonging to the exclusive competence of the state, which excludes regions from legislating to protect the environment. In this sense, the Court permits an indirect intervention on environmental aspects when regions adopt legislation in the subject matters that belong to their competences and intersect with the protection of the environment. This intervention, however, is admissible only to enforce higher standards of environmental protection.¹² The transversality of environmental protection, furthermore, may compress regional competences if regional

Autonomous Provinces of Trento and Bolzano have exercised legislative powers in the field of environmental protection, based on some specific subject matters included in the autonomy statutes.

- 9 According to art. 116(3) of the Italian Constitution, regions would be entitled to negotiate with the state additional forms and specific conditions of autonomy in both shared and some of the exclusive powers of the state, including the protection of the environment. This provision however has not received application as yet, although many ordinary regions have tried to implement it. See M. Alberton, *Governi ambientali negli ordinamenti composti*, *supra*, at 105–112. Another relevant provision is art. 117(4) Constitution, which establishes that regions hold residual powers in matters not explicitly assigned to the state.
- 10 *Ibid.*, at 149–150. The author highlights (at 151) that the majority of these cases were filed by the state.
- 11 Corte cost. 407/2002. Translation in English is the authors’. Other decisions confirm this point: Corte cost. 536/2002, 226/2003, 227/2003, 311/2003, 391/2005 and 63/2020. See M. Alberton, *Governi ambientali negli ordinamenti composti*, *supra*, at 196ff. See also F. Benelli, “L’ambiente tra “smaterializzazione” della materia e sussidiarietà legislativa”, *Le Regioni*, 1 (2004) 176–184.
- 12 Corte cost. 407/2002, 12/2009, 225/2009, 235/2011, 263/2011, 106/2012, 171/2012, 278/2012, 58/2013, 199/2014, 74/2017, 77/2017, 7/2019, 63/2020, 88/2020 and 134/2020. There are also exceptions to the possibility for the regions to adopt higher standards, when there are other interests beyond environmental protection that need to be balanced against by the state. See Corte cost. 307/2003, 116/2006, 214/2008, 61/2009, 225/2009, 247/2009, 147/2019, 178/2019 and 258/2020.

legislative acts are deemed in contrast with national environmental legislation that establishes unitary principles or constitutes a transversal socio-economic reform.¹³ In this sense, regions cannot exercise their own competences in a way that derogates from unitary standards established by the state for the protection of the environment.¹⁴ Regions may instead intervene to protect the environment when this is established by national laws or when specific powers are provided for in the Statutes of autonomous regions/provinces.¹⁵ However, the Court is clear in concluding that regions, even autonomous ones, have no general competence on environmental protection.¹⁶

Concerning transport-related policies (concurring legislation), the Italian Constitutional Court has applied extensively the subsidiarity call doctrine.¹⁷ Unlike decisions concerning the compression of regional powers in environmental-related policies, the attraction of powers to the central level may be considered legitimate only if previously discussed with the regions concerned (vertical coordination). When necessary, horizontal coordination must be carried out among regions. Furthermore, according to the Court, local transport lies unproblematically in the residual competences of the regions and is not subject to any subsidiarity call or centralization by the State.¹⁸

Concerning energy policies, the Constitutional Court shares the same orientation on the prevalence of unitary national norms over energy-related legislative acts adopted at regional level. For instance, parameters for both the authorization of renewable energy parks and minimum distances from wind parks need to be established by national laws and cannot be derogated from

13 This is what scholars usually call "*chiamata in sussidiarietà*" (subsidiarity call), the capacity of national norms to trump regional ones, even if adopted in pursuance to regional powers, when national norms establish nationally applicable principles/norms that serve unitary principles. To understand this mechanism in theory, see e.g. F. Carinci, "Il principio di sussidiarietà verticale nel sistema delle fonti", *forumcostituzionale.it*, (2006). See Corte cost. 378/2007, 104/2008, 74/2017, 63/2020, 130/2020 and 240/2020. See also, M. Alberton, *Governi ambientali negli ordinamenti composti, supra*, at 214–215.

14 Corte cost. 536/2002, 222/2003, 259/2004 and 108/2005.

15 Corte cost. 259/2004, 214/2005 and 62/2008.

16 Corte cost. 329/2008, 12/2009, 61/2009 and 9/2013.

17 See note 13 above and report published on the Constitutional Court's website at <https://leg16.camera.it/465?area=32&tema=722&La+giurisprudenza+costituzionale>.

18 See Corte cost. 52/2020. L. Magnifico, "Stato, regione o autorità di regolazione alla guida del trasporto pubblico locale?", *Osservatorio AIC*, 1 (2013) 1–14, at 1. See also A. Zito, "I riparti di competenze in materia di servizi pubblici locali dopo la riforma del titolo v della Costituzione", *Diritto amministrativo*, 2 (2003) 385–410; G. Sciallo, "Stato, Regioni, e servizi pubblici locali nella pronuncia n. 272/2004 della Consulta", *www.lexitalia.it*, 7–8 (2004).

by regional laws.¹⁹ This is true also specifically for the Autonomous Provinces of Trento and Bolzano.²⁰ In this sense, it is particularly worth mentioning the principle of the broadest spread possible of renewable energy sources (hereinafter RES) (“*principio di massima diffusione delle fonti di energia rinnovabili*”). In this sense, regions may have the possibility to identify areas not suitable for renewable energy parks, for instance for health reasons, only on a case-by-case basis and pursuant to the principles and criteria established in the Guidelines adopted through D.M. 10 September 2010.²¹

While water protection is subsumed, as reminded, under the general exclusive competence of the state on environmental protection,²² large hydroelectric plants are to be considered in the shared competence of the state and regions since they fall within the field of concurring legislation concerning national production, transport and distribution of energy. In this matter, the state shall establish the main principles in the field but cannot adopt detailed legislation. In particular, decisions concerning the duration of permits fall within the shared competence. The assignment of permits instead falls in the exclusive competence of the state regarding the protection of competition.²³

Finally, in the field of spatial planning, land-use planning is a concurring policy. The constitutional reform in 2001 changed the denomination of this policy area from “urban planning” to “land-use planning”. The first issue was therefore to determine whether land-use planning included urban planning, especially in view of the fact that most regional statutes, such as those of the Autonomous Provinces of Trento and Bolzano, list urban planning among their primary competences.²⁴ Both scholars and the Constitutional Court have concluded that urban planning is a sub-species of the *genus* land-use planning.²⁵ In line with this doctrine, national legislation sets general principles in the field of land-use planning, which usually tend to erode regional powers

19 C. Pellegrino, “Ambiente ed energia: la Corte costituzionale conferma i suoi orientamenti e il suo ruolo di suppletiva ermeneutica”, *Le Regioni*, 3 (2019) 843–855. R. Nevola (ed.), *Giurisprudenza costituzionale dell'anno 2020* (Servizio studi Corte costituzionale 2021), at 497–504.

20 R. Cocciolito, “La competenza legislativa della Provincia di Trento in materia di energia alla prova degli standards minimi di tutela ambientale”, *Osservatorio AIC*, 2 (2014) 1–3.

21 Corte cost. 286/2019.

22 Corte cost. 32/2005, 117/2005, 246/2009, 29/2010, 142/2010, 325/2010, 128/2011, 187/2011, 62/2012, 67/2013, 228/2013, 65/2019 and 153/2019.

23 Corte cost. 1/2008 and 155/2020.

24 On this point, see Chapter 3 in this volume.

25 See http://leg15.camera.it/cartellecomuni/leg14/RapportoAttivitaCommissioni/testi/08/08_cap11_scho1.htm.

in related subject matters.²⁶ Rather different is the position of autonomous regions (and provinces) that hold primary competences in the fields of urban planning and landscape protection and therefore may benefit from a more consolidated articulation of powers in these fields.²⁷ In a landmark decision of 2007, the Constitutional Court distinguished between the protection of landscape as a concrete material good, which must be in the hands of the state, and the use of territory, which is in the powers of regions.²⁸ Most recently, the Court has defined landscape planning as a field of collaboration between the state and regions; in other words, landscape plans need to be elaborated jointly by the national and the regional levels.²⁹

A final aspect related to urban planning to be mentioned here concerns building law, here intended as the field of law that regulates building standards for houses (e.g. height of buildings, building permissions, energy requirements for buildings etc.). Although not being included explicitly in the constitutional catalogues of exclusive or shared competences, building law falls within the shared competence of land-use planning, as clarified in the jurisprudence of the Italian Constitutional Court.³⁰ Legislation in this field is subject not only to the fundamental principles established in the field of land-use planning, but also to those in the field of health protection, which is also a shared competence under article 117(3) of the Italian Constitution.³¹ Furthermore, building requirements affect landscape and therefore are subject to the requirements established in landscape plans, which prevail over urban plans on the basis of the prevalence of environmental powers of the state over regional powers intersecting with environmental protection.³²

2.2 *Austria*

The way a legal system addresses a certain problem is influenced by its constitutional design. Austria is a federal state, consisting of nine *Bundesländer*.³³

26 R. Nevola (ed.), *Giurisprudenza costituzionale*, at 487–495.

27 M. Mengozzi, “Il “Governo del territorio” e la sua intersezione strutturale con la “tutela dell’ambiente”: linee di continuità e di evoluzione”, *federalismi.it*, 15 (2017) 2–30, at 22.

28 Corte cost. 367/2007.

29 Corte cost. 66/2018, 86/2019 and 130/2020.

30 Corte cost. 303/2003, 362/2003, 196/2004, 233/2015 and 125/2017.

31 Corte cost. 134/2014 and 54/2021.

32 Corte cost. 180/2008 and 54/2021.

33 Art. 2(2) Federal Constitutional Law, *Bundes-Verfassungsgesetz* – B-VG, StF: BGBl. Nr. 1/1930 (last amendment: BGBl. I 235/2021). All translations of acts, unless otherwise stated, are provided by the Austrian Legal Information System RIS, https://www.ris.bka.gv.at/Dokument.wxe?Abfrage=Erv&Dokumentnummer=ERV_1930_1. Please note, that the

The Austrian Constitution comprises various documents.³⁴ The core document, the Federal Constitutional Law,³⁵ includes the distribution of competences in its articles 10–15.

The protection of the climate or the fight against climate change is not explicitly listed as a duty of the *Bund* or as a policy field in the Austrian Constitution, nor does the distribution of competences mention the fight against climate change. A draft amendment to the Austrian Constitution,³⁶ which would have introduced the fight against climate change as state aim (*Staatsziel*) together with a new provision on the distribution of competences in the field of climate change (with an emphasis on the reduction of emissions) as early as in 2008, was dropped.³⁷ When a separate constitutional act, the Federal Constitutional Act on sustainability, animal protection, comprehensive environmental protection, on water and food security as well as research was introduced in 2013,³⁸ sustainability and environmental protection were listed as state aims, but the fight against climate change was not.³⁹ Yet, the state aims of sustainability and environmental protection are so closely linked to climate change that the latter might be considered implicitly part of the Constitution. In this sense, climate change would be a constitutionally stipulated policy field. The Act mentioned provides amongst others that all state powers are committed to the principle of sustainability in using natural resources to ensure that future generations will also benefit from optimal quality of life. Since state aims bind not only the

translations regarding the Bundes-Verfassungsgesetz are sometimes referring to it as Federal Constitutional Law and sometimes as Federal Constitutional Act.

- 34 T. Öhlinger and H. Eberhard, *Verfassungsrecht*, 13 (facultas 2022), 26ff.
- 35 *Bundes-Verfassungsgesetz – B-VG*, StF: BGBl. Nr. 1/1930; the Federal Constitutional Law dates back to 1920, *Bundes-Verfassungsgesetz – B-VG*, StF: BGBl. Nr. 1/1920 with the distribution of competences entering into force with an amendment (*Bundes-Verfassungsnovelle* BGBl. Nr. 268/1925) in 1925.
- 36 Draft bill, *Ministerialentwurf Bundesverfassungsgesetz, mit dem das Bundesverfassungsgesetz vom 27. November 1984 über den umfassenden Umweltschutz geändert wird, Bundesverfassungsgesetz, mit dem das Bundes-Verfassungsgesetz geändert wird, und Bundesgesetz, mit dem dem Bund und den Ländern Klimaschutzverpflichtungen zugeordnet werden* (*Bundesklimaschutzgesetz*), 204/ME XXIII. GP.
- 37 T. Habjan, “Das österreichische Klimaschutzgesetz”, in G. Kirchengast, E. Schulev-Steindl and G. Schnedl (eds.), *Klimaschutzrecht zwischen Wunsch und Wirklichkeit* (Böhlau Verlag 2018) 98–110, at 99ff (with further references especially in footnote 20).
- 38 *Bundesverfassungsgesetz über die Nachhaltigkeit, den Tierschutz, den umfassenden Umweltschutz, die Sicherstellung der Wasser- und Lebensmittelversorgung und die Forschung*, StF: BGBl. I 111/2013 (last amendment: BGBl. I Nr. 82/2019).
- 39 Own-initiative motion, *Initiativantrag betreffend ein Bundesverfassungsgesetz über die Nachhaltigkeit, den Tierschutz, den umfassenden Umweltschutz, die Sicherstellung der Wasser- und Lebensmittelversorgung und die Forschung*, 2316/A XXIV. GP 3 f.

administration and the judiciary, but also the legislator,⁴⁰ the latter might be called upon to act and pass a law.⁴¹ Additionally, state aims in general not only address the federal and the *Land* level, but also municipalities.⁴²

Although climate change has not been recognized by the Constitutional Court as such, state aims implicitly covering climate-related issues can be used to examine the constitutionality of simple laws.⁴³ However, there are three caveats to that: first, inactivity of the legislator can only be brought before the Constitutional Court when it leads to a defective law; second, if there is no law at all, the Constitutional Court can neither be called upon nor decide *ex officio*.⁴⁴ Third, although the Constitutional Court itself points to the possibility of examining the constitutionality of acts and administrative regulations with regard to state aims,⁴⁵ there are only very few cases on that topic and up until now the Court has not declared a legal act unconstitutional because of the violation of a state aim.

Most of the *Länder* have incorporated state aims regarding the prevention of climate change,⁴⁶ pursuant to their constitutional autonomy.⁴⁷ The

40 T. Zahl, "Gesellschaftliche Herausforderungen und objektives Verfassungsrecht", in M. Becker *et al.* (eds.), *Gesellschaftliche Herausforderungen – Öffentlich-rechtliche Möglichkeiten* (Jan Sramek 2019) 35–63, at 44.

41 J. Egger, *Untätigkeit im Öffentlichen Recht* (Verlag Österreich 2020), at 89.

42 In this context, see the Federal Constitutional Act on sustainability, animal protection, comprehensive environmental protection, on water and food security, where all the state aims enshrined start with the following wording "The Republic of Austria (federal government, federal provinces and municipalities) ...".

43 See e.g. Constitutional Court 29 June 2017, VfSlg. 20.185/2017. State aims however cannot be enforced by individuals, see M. Bertel, "Staatszielbestimmungen", in J. Breitenlechner *et al.* (eds.), *Sicherung von Stabilität und Nachhaltigkeit durch Recht* (Jan Sramek 2014) 139–159, at 148ff.

44 M. Holoubek, "Säumnis des Gesetzgebers", in M. Holoubek and M. Lang (eds.), *Rechtsschutz gegen staatliche Untätigkeit* (Linde Verlag 2011) 247–264, at 251.

45 See VfSlg. 20.185/2017: „Der Verfassungsgerichtshof hat in ständiger Rechtsprechung das BVG Umweltschutz zur Prüfung von Gesetzen auf ihre Verfassungsmäßigkeit und von Verordnungen auf ihre Gesetzmäßigkeit herangezogen (see VfSlg 11.990/1989, 12.009/1989, 12.485/1990, 12.486/1990, 13.102/1992, 13.718/1994, 14.551/1996 und 19.584/2011)“.

46 Art. 7a(2) No. 2 and art. 7b *Kärntner Landesverfassung* – K-LVG, StF: LGBL. Nr. 85/1996 (last amendment: LGBL. Nr. 97/2021), art. 4 *NÖ Landesverfassung* 1979, StF: LGBL. 0001-0 (last amendment LGBL. Nr. 34/2021), art. 10(3) *Oö. Landes-Verfassungsgesetz*, StF: LGBL. Nr. 122/1991 (last amendment: LGBL. Nr. 39/2019), art. 9 *Sbg Landes-Verfassungsgesetz* 1999 – L-VG, StF: LGBL. Nr. 25/1999 (last amendment: BGL. 41/2019), art. 7(3) *Tiroler Landesordnung* 1989, StF: LGBL. Nr. 61/1988 (last amendment: LGBL. Nr. 133/2019), art. 7 (7) *Verfassungsgesetz über die Verfassung des Landes Vorarlberg*, StF: LGBL. Nr. 9/1999 (last amendment: LGBL. Nr. 3/2022).

47 T. Öhlinger and H. Eberhard, *Verfassungsrecht*, 120ff. See art. 99 Federal Constitutional Law.

limitation is that *Land* constitutions are not allowed to contradict the federal Constitution. The scope of these state aims laid down in the *Land* constitutions is limited to the territory of the *Länder*.⁴⁸ The (legal) consequences of state aims are the same, irrespective of whether they are state aims of the *Länder* or of the *Bund*: they can, at least in theory as laid down above, play a role in examining the constitutionality of laws (in the case of *Land* state aims limited to the legal acts of the respective *Land*). They can furthermore play a role in the interpretation of law and in balancing decisions.⁴⁹

Whereas the legislative competences of the federal level are listed (mainly) in article 10 of the Federal Constitutional Law, the legislative competences of the *Länder* derive from a residuary clause enshrined in article 15(1) of the Federal Constitutional Law. The fact that climate change is not listed as a competence matter of the federal level does not mean that it falls into the residuary clause, and is therefore a competence of the *Länder*.⁵⁰ Since it is a complex matter,⁵¹ it is considered a “*Querschnittsmaterie*” (“cross-sectional matter”) consisting of legislative competences of the federal level and of legislative competences of the *Länder*.⁵² Thus, for the analysis of the situation regarding the distribution of competences covering climate change, one has to look into the matters linked to climate change, such as environmental protection, transport, energy and water as well as spatial planning.

Environmental protection, energy, and spatial planning are themselves so-called “*Querschnittsmaterien*”,⁵³ therefore partly covered by *Land* competences and partly covered by federal competences in legislation as well as in administration. The same holds true for “transport”: according to article 10(1) No. 9 of the Federal Constitutional Law, transport in the sense of a “traffic-system relating to the railways, aviation and shipping in so far as the last of these does not fall under article 11” and “motor traffic” (“*Kraftfahrwesen*”) are competences of the federal level in legislation and administration. Linked to traffic is “road law” in the sense of the regulation of highways and other roads, which is split

48 Constitutional Court, VfSlg. 20.185/2017.

49 A. Gamper, “Artikel 7 Ziele und Grundsätze des staatlichen Handelns”, in P. Bußjäger, A. Gamper and C. Ranacher (eds.), *Tiroler Landesverfassungsrecht* (Verlag Österreich 2020) 110–132, paras. 19–20.

50 Similar, but with regard to environmental protection G. Schnedl, *Umweltrecht* (facultas 2020), at 108.

51 P. Pernthaler, *Österreichisches Bundesstaatsrecht* (Verlag Österreich 2004), at 338.

52 T. Öhlinger and H. Eberhard, *Verfassungsrecht*, at 138.

53 G. Schnedl, *Umweltrecht*, at 108 (environmental protection), 255 (energy) and 263 (spatial planning).

up between roads of the federal level and roads of the *Länder*.⁵⁴ Linked to transport is the regulation of air pollution, which falls into the competence of the federal level with the exclusion of air pollution emanating from heating systems, which is a competence of the *Länder* (“*Luftreinhaltung, unbeschadet der Zuständigkeit der Länder für Heizungsanlagen*”).

Regulation of water is a competence of the federal level (article 10(1) No. 10 Federal Constitutional Law). Moreover, within the field of energy, article 12(1) of the Federal Constitutional Law provides for a so-called legislation in principle (“*Grundsatzgesetzgebung*”) of the *Bund* and a competence for implementing legislation according to the principles of the *Länder* (“*Ausführungsgesetzgebung*”) regarding electricity. This means, that the *Bund* lays down principles of electricity law which are further developed by the *Länder*.⁵⁵ Yet, according to article 10(1) No. 9 of the Federal Constitutional Law, the high voltage grid covering two or more *Länder* falls into the competence of the federal level.

The distribution of competences regarding spatial planning was already resolved in 1954 by the Constitutional Court. Since then, spatial planning is seen as a “*Querschnittsmaterie*”;⁵⁶ partly covered by the abovementioned competences of the federal level regarding spatial planning within other competence matters, such as railways, aviation, roads of the federal level, water law, and high voltage grid, and electricity, amongst others.⁵⁷ General spatial planning is instead a competence of the *Länder*.⁵⁸

Lastly, it is worth mentioning building law, which falls into the competence of the *Länder* according to article 15(1) Federal Constitutional Law. This competence entails legislation regarding, e.g., building plots, the heights of buildings or how a residential building has to be constructed. The competence matter includes technical rules on materials that can be used.⁵⁹ Building law is therefore relevant with regard to climate change, because building law might facilitate or hinder the use of climate-friendly materials or facilitate the expansion of renewable energy (e.g. photovoltaics on the roof).

In Austria it is possible that acts contain single constitutional provisions (competence clauses). Whenever the requirements for constitutional

54 *Ibid.*, at 250 and art. 10(1) No. 9, art. 15(1) Federal Constitutional Law.

55 T. Öhlinger and H. Eberhard, *Verfassungsrecht*, at 126ff.

56 Constitutional Court VfSlg. 2674/1954.

57 G. Schnedl, *Umweltrecht*, *supra*, at 263.

58 Art. 15(1) Federal Constitutional Law.

59 D. Jähnel, “Baurecht”, in S. Bachmann *et al.* (eds.), *Besonderes Verwaltungsrecht* (Verlag Österreich 2022) 565–597, at 592ff.

amendments, that is a two-thirds majority and the presence of at least half of the members of the National Council, are ensured,⁶⁰ the legislator can act as constitutional legislator. That way, it can also change the distribution of competences for specific cases. For instance, the Renewable Energy Expansion Act⁶¹ contains a “competence-covering clause”. In its paragraph 1, which is a constitutional provision, it stipulates that “[t]he issuing, repealing and executing of rules such as those contained in this Federal Act lies with the federal government even with regard to matters for which the [Federal Constitutional Law ...] provides otherwise”. These clauses usually have a centralizing purpose.

According to the longstanding case law of the Constitutional Court, competence matters have to be interpreted with a special method of interpretation, the so-called “*Versteinerungstheorie*” (“petrification theory”).⁶² This means that, to identify the constitutional scope of competences, one has to look into the ordinary laws (regulating that competence matter) that were in force at the time the competence matter was enacted (usually this is 1 October 1925, when the distribution of competences entered into force).⁶³ New developments, which would not be covered by the laws at the time the competence matter was enacted, can be part of the competence matter when they are systematically connected to the matter regulated in ordinary laws (“*intrasystematische Fortentwicklung*”; “intrasystematic development”).⁶⁴ Constitutional jurisprudence has shown that the principle of the intrasystematic development leads to a centralization of new competence matters.⁶⁵

Finally, in the constitutional jurisprudence of recent years, climate related matters regarding the distribution of competences did not arise very often.⁶⁶

60 Art. 44(2) Federal Constitutional Law.

61 *Erneuerbaren-Ausbau-Gesetz* – EAG, StF: BGBl. I Nr. 150/2021 (last amendment: BGBl. I Nr. 13/2022).

62 T. Öhlinger and H. Eberhard, *Verfassungsrecht*, at 138ff.

63 P. Pernthaler, *Österreichisches Bundesstaatsrecht*, at 332ff.

64 *Ibid.*, at 333ff.

65 *Ibid.*, at 334 and A. Gamper, “Kompetenzgerichtsbarkeit und Kompetenzinterpretation in Österreich”, in A. Gamper et al. (eds.), *Föderale Kompetenzverteilung in Europa* (Nomos 2016) 575–606, at 593ff.

66 See e.g. Constitutional Court VfSlg. 20.390/2020 (amongst others clarifying the consequences of a competence covering clause on administration), VfSlg. 20.185/2017 (regarding the scope of *Länder* state aims) or VfSlg. 17.160/2004 (obtaining bids for balancing energy or determining prices for balancing energy does not fall within the competence matter “stock market”).

3 The National Legal Framework on Climate Change

3.1 *Italy*

Pursuant to the Paris agreement, Italy has committed itself, jointly with the other Member States of the European Union, to both implement substantial emission reductions of greenhouse gases (GHG) of 55% by 2030 and reach carbon neutrality by 2050.⁶⁷ In order to meet these mitigation standards, Italy needs to act on several fronts.

A good starting point to gain a comprehensive view of Italy's legal framework on climate change is to consult the London School of Economics (LSE) Database on Climate Change Laws of the World, which provides a list of both instruments adopted by Italy, either as result of the legislative process or as more executive acts.⁶⁸ What clearly emerges from this non-exhaustive list is the close link between climate and energy policies in Italy, since most of the acts listed concern the transition to RES or energy efficiency. This is illustrated both in the long-term strategies on climate and energy and in legislation on the same matters. In the following, strategies are described first since they establish the overall framework upon which legislation is built.

Italian plans and strategies on climate change are a complex set of instruments, adopted throughout the years by many different executive authorities, mainly to respond to EU provisions that required Member States to adopt national plans to implement EU measures. Their importance lies in the long-term vision they aim to promote, which should be later enacted through the adoption of specific legislation in the field of climate change.⁶⁹ Furthermore, the targets they establish usually echo EU or international mandatory standards. Some of these strategies instead limit themselves to propose policy options to achieve those standards (such as the *Strategia energetica nazionale* below). One of the first of such plans is the *Piano nazionale di riduzione dei gas serra*, adopted in 2002 (and later revised in 2007) pursuant to article 2 L. 120/2002,⁷⁰ which aimed to lay down a framework for Italy to respect the emission

67 See Chapter 1 in this volume; Servizio studi della Camera dei deputati, *Dossier sui cambiamenti climatici* (Camera dei deputati 2002), available at https://temi.camera.it/legi8/temi/th8_cambiamenti_climatici.html.

68 See https://climate-laws.org/legislation_and_policies. The website of the Ministry for Ecological Transition, instead, does not offer an updated and comprehensive list of climate-related strategies and legislative provisions.

69 The Italian National Adaptation Strategy will not be analyzed since adaptation to climate change goes beyond the scope of this book.

70 See CIPE (Intergovernmental Committee for Economic Planning) resolution of 19 December 2002, available at https://www.mite.gov.it/sites/default/files/archivio/documenti/deliberaCIPE_19_12_02.pdf; CIPE resolution 135/2007 of 11 December 2007, available at <https://ricerca-delibere.programmazioneeconomica.gov.it/135-11-dicembre-2007/>.

reduction objectives agreed upon in the Kyoto Protocol to the United Nations Framework Convention on Climate Change (UNFCCC).⁷¹

More recent is the *Strategia italiana di lungo termine sulla riduzione delle emissioni dei gas a effetto serra*,⁷² jointly adopted in 2021, pursuant to article 15(1) of Regulation (EU) 2018/1999,⁷³ by the Ministry of the Environment and the Protection of Land and Sea,⁷⁴ the Ministry for Economic Development, the Ministry for Infrastructures and Transport, and the Ministry for Agriculture, Food and Forestry Policies. The document lays out options for decarbonization in the major emitting policy sectors, including transport and land use with the aim of reaching carbon neutrality.⁷⁵ Scenarios for decarbonization elaborated in the strategy are based *inter alia* on the assumption that the objectives contained in the *Piano nazionale integrato per l'energia e il clima* (hereinafter PNIEC),⁷⁶ adopted in 2019 by the Ministry for Economic Development in pursuance of article 3 of Regulation (EU) 2018/1999, will be met.

The PNIEC builds upon the 2017 *Strategia energetica nazionale*⁷⁷ and wishes to set standards in response to the emission reduction obligations contained in Regulation (EU) 2018/842,⁷⁸ which is directly applicable in Italy. The PNIEC both establishes key objectives and targets for the period 2021–2030⁷⁹ and

71 See Chapter 1 in this volume.

72 Italian long-term strategy on the reduction of emissions from GHG. See Servizio studi della Camera dei deputati, *Dossier sui cambiamenti climatici*, *supra*.

73 Regulation (EU) 2018/1999 of the European Parliament and of the Council of 11 December 2018 on the Governance of the Energy Union and Climate Action, amending Regulations (EC) No. 663/2009 and (EC) No. 715/2009 of the European Parliament and of the Council, Directives 94/22/EC, 98/70/EC, 2009/31/EC, 2009/73/EC, 2010/31/EU, 2012/27/EU and 2013/30/EU of the European Parliament and of the Council, Council Directives 2009/19/EC and (EU) 2015/652 and repealing Regulation (EU) No. 525/2013 of the European Parliament and of the Council.

74 See note 3 above.

75 Carbon neutrality is defined in the Strategy as a condition where residual GHG emissions are compensated through CO₂ absorption, geological storage, and reuse.

76 Integrated national and climate plan. The PNIEC is available at <https://www.mise.gov.it/index.php/it/notizie-stampa/pniec2030>.

77 National energy strategy, adopted jointly by the Ministry for Economic Development and the Ministry for the Environment and the Protection of Land and Sea (now Ministry for Ecological Transition). For a summary of this strategy, see <https://www.mite.gov.it/comunicati/strategia-energetica-nazionale-2017>.

78 See Chapter 1 in this volume.

79 A comprehensive overview of these objectives can be found in *Documentazione per l'esame di Atti del Governo, Promozione dell'uso dell'energia da fonti rinnovabili: Atto del Governo 292* (Senato della Repubblica e Camera dei Deputati 2021), available at <https://www.camera.it/leg18/682?atto=292&tipoAtto=Atto&idLegislatura=18&tab=1#inizio>, at 4.

proposes policies and measures related to dimensions such as decarbonization and energy efficiency. The PNIEC interestingly shows that the highest share of CO₂ emissions comes from energy industries and transport.⁸⁰ The transport sector has also the greatest potential for energy reductions and thus increased energy efficiency.⁸¹ Concerning relevant measures, in the sector of energy/electricity production, the PNIEC announces that Italy plans to phase out coal by 2025, while at the same time increasing RES and replacing energy infrastructures to support these changes.⁸² Concerning the transition to RES, the PNIEC encourages the promotion of systems for self-consumption and energy storage, also by means of economic support for renewable energy communities.⁸³ Most importantly, the installation of new RES plants should be carried out in accordance with the regions.⁸⁴

With the newly adopted *Piano nazionale di ripresa e resilienza* (hereinafter PNRR) (2021), which aims to implement the Next Generation EU program nationally, Italy earmarks more than 31% of the total amount of funds received (about 70 billion euros) to implement the objectives of both the *Proposta di piano per la transizione ecologica*, described below, and the PNIEC in terms of emission reductions, energy efficiency, and the transition to RES.⁸⁵ The PNRR lays down concrete interventions in a number of sectors, including transport and energy. Huge investments are envisaged for instance for the improvement of transport by rail of both persons and goods, intermodality, and digitalization.⁸⁶ Other measures concern systems to monitor territorial risks linked to climate change, air pollution, water management, and inadequate land-use and urban planning,⁸⁷ the promotion of energy communities in small municipalities, the development of smart and resilient energy grids, hydrogen production and storage, as well as the removal of administrative obstacles to the diffusion of renewable energies.⁸⁸ The PNRR is to be read in conjunction with a series of legislative measures that enable its concrete implementation, including D.L. 77/2021, D.L. 80/2021, D.L. 152/2021, and D.L. 36/2022, all of which have been transposed into law.

80 PNIEC, at 57 and 65.

81 *Ibid.*, at 83. Measures to ensure low emission mobility are listed at 163–171, while energy efficiency in the mobility sector is discussed at 180–89.

82 *Ibid.*, at 131.

83 *Ibid.*, at 141 and 143.

84 *Ibid.*, at 146–147.

85 Servizio studi della Camera dei deputati, *Dossier sui cambiamenti climatici*, *supra*.

86 PNRR, at 167ff.

87 *Ibid.*, at 211ff.

88 *Ibid.*, at 249ff.

Italy has also drafted the *Proposta di piano per la transizione ecologica* (hereinafter pPTE),⁸⁹ to be approved by the *Comitato interministeriale per la transizione ecologica* (hereinafter CITE),⁹⁰ created pursuant to article 4 of D.L. 22/2021. The pPTE reiterates emission reduction goals of 55% by 2030 and carbon neutrality by 2050. RES should represent a share of 72% by 2030 and 100% by 2050 in the production of electricity. The pPTE reaffirms the priority to be given to rail as well as the use of lower-emission fuels and a steady increase in electric cars. Land-use neutrality is also to be achieved by 2030, with a specific focus on the enhancement of both water infrastructures and protected areas.

While strategies seem to converge upon the long-term objective of carbon neutrality, laws lay down specific provisions that contribute to this objective. Concerning specific legislation to contrast climate change, the main statutory acts are: (1) D.L. 111/2019 (so called Climate Act), which *inter alia* establishes under article 1(2) that any public administration should act in compliance with the objectives to combat climate change and air pollution; (2) D.lgs. 47/2021, which implements Directive 2018/410/EU on the emission trading market; and (3) article 50 of D.L. 76/2020, as reformed by article 17 of D.L. 77/2021, which has created a simplified environmental impact assessment procedure for projects that contribute to the enactment of PNIEC and PNRR.⁹¹

In the field of renewable energy promotion, D.lgs. 28/2001 and D.lgs. 199/2021 (enacting Directive 2018/2001/EU) establish a preference towards RES, which is considered one of the main normative principles in this area, and as reminded, cannot be derogated by regions according to the Italian Constitutional Court. L. 53/2021 is also relevant in that it *inter alia* (1) delegates the government to adopt common criteria to identify suitable and unsuitable areas for the installation of RES plants, and (2) promotes the development of biofuels. Areas shall then be identified by regions in accordance with national criteria. D.lgs. 387/2003, as amended, promotes electricity produced through RES.

Concerning energy efficiency, the main legislative framework is constituted by D.lgs. 73/2020, which amended D.lgs. 102/2014 and implemented Directive

89 Proposed plan for ecological transition. Governmental Act No. 297, available at <https://www.camera.it/leg18/682?atto=297&tipoAtto=Atto&idLegislatura=18&tab=2>.

90 Interministerial Committee for Ecological Transition.

91 Important laws that provide for specific financial resources are described in Servizio studi della Camera dei deputati, *Dossier sui cambiamenti climatici, supra*.

EU 2018/2002.⁹² D.lgs 48/2020 complements this framework by implementing Directive 2018/844/EU on the energy performance of buildings. From a financial perspective, D.L. 63/2013 and related amendments reinforced the previous regime on tax deductions for the improvement of energy efficiency in buildings, while article 119 of D.L. 34/2020 introduced a tax deduction of 110% for the expenses related to specific energy efficiency projects, including thermal insulation of buildings, installation of central heating, and others.

Legislation in the field of transport aims primarily to reduce GHG emissions, including D.lgs 187/2021 on the promotion of clean road vehicles, paragraph 1031 of budgetary L. 145/2018 on incentives to buy electric or hybrid cars, D.L. 111/219 on a program to encourage the use of electric bikes, as well as legislative measures promoting the creation of cycle lanes, and D.L. 34/2020 on disincentives to the use of private vehicles in urban areas.⁹³ It is also worth mentioning the sectoral plan *Piano strategico nazionale della mobilità sostenibile*, approved through DPCM 30 April 2019.⁹⁴

Finally, regarding land-use, the legislative framework on biodiversity protection may have an impact on the issue of how to use soil to limit and contain GHG emissions. L. 394/1991 on protected areas is certainly a cornerstone in this respect. Biodiversity protection however, as explained in section 2.1 above, does not fall within the subject area of land-use, but is rather considered as part of environmental protection.⁹⁵ Given the broad scope of land-use as a shared policy matter, a comprehensive legislative intervention is currently lacking, although there are several draft laws currently under examination by the

92 Servizio studi della Camera dei deputati, *Dossier su risparmio ed efficienza energetica* (Camera dei deputati 2022), available at https://temi.camera.it/leg18/temi/th8_risparmio_efficienza_energetica.html.

93 Servizio studi della Camera dei deputati, *Dossier sulla mobilità sostenibile* (Camera dei deputati 2021), available at <https://www.camera.it/leg17/465?tema=l-innovazione-nel-trasporto-stradale-e-la-mobilit-sostenibile>. See also *decreto ministeriale* (ministerial decree) 12 May 2021.

94 See Chapter 4 in this volume.

95 For this reason, the legislative framework on biodiversity protection is not analyzed in this chapter. See C. Baseggio, “Competenze statali, regionali e locali in tema di aree naturali protette nella giurisprudenza della Corte costituzionale e nella recente legislazione regionale”, *Istituzioni del federalismo*, 5 (2007) 513–546; M. Mancini, “La disciplina degli istituti di protezione della fauna selvatica e della biodiversità, nel quadro del riparto delle competenze tra Stato e Regioni”, *Ricerche giuridiche*, 6 (2017) 23–54; thematic sheet of Camera dei deputati at <https://temi.camera.it/leg7/temi/biodiversita>; F. Carpita, *Aree protette e tutela della biodiversità. 1 parchi italiani nella cornice europea* (Edizioni ETS 2016); G. Bellomo, “Il modello giuridico delle aree naturali protette in Italia tra valorizzazione e protezione sostenibile”, *Revista de Direitos Difusos*, 72 (2019) 10–42.

Parliament, which seek to provide a systematic framework that could guide the legislative initiative of regions.⁹⁶

3.2 *Austria*

Similarly to Italy, Austria has committed itself to reducing its GHG emissions significantly.⁹⁷ A look into the abovementioned LSE Database reveals that different overlapping strategies and laws are addressing climate change, together with more general environmental issues and energy matters. This interconnectedness seems to be coherent with the state aims presented above (“sustainability, animal protection, comprehensive environmental protection, water and food security as well as research”).

In the Austrian literature, climate protection law is described as aiming to protect the climate “from those anthropogenic interferences that increase the concentration of greenhouse gases in the atmosphere”,⁹⁸ therefore encompassing law on air pollution, environmental energy law and environmental transport law.⁹⁹ Yet, literature also points out that since climate protection law is a rather young field of law in Austria, its development is not yet concluded.¹⁰⁰

Strategies are not a recognized source of law in Austria unless they are enacted as legal acts or administrative regulations. The adoption of the strategies mentioned is usually required by EU law or international law. Main strategies encompass the National Energy and Climate Plan as well as the Recovery and Resilience Plan. Other strategies worth mentioning are the Austrian Sustainability Strategy of the *Bund*¹⁰¹ and the Sustainability Strategy of the *Bund* and the *Länder*.¹⁰² The implementation of the UN

96 See M. Munafò (ed.), “Consumo di suolo dinamiche territoriali e servizi ecosistemici”, *Report SNPA 22/21*, (2021), available at https://www.snambiente.it/wp-content/uploads/2019/09/Rapporto_consumo_di_suolo_20190917-1.pdf, at 21ff; Servizio studi del Senato della Repubblica, *Consumo di suolo: elementi di legislazione regionale* (Senato della Repubblica 2019), available at <https://www.senato.it/service/PDF/PDFServer/BGT/01105756.pdf>. A relevant instrument at the national level is the *decreto direttoriale* (Directorial Decree) 117 of 15 April 2021, adopted by the Ministry for Ecological Transition, which created the experimental program for adaptation to climate change in urban contexts.

97 See section 3.1. above.

98 G. Schnedl, *Umweltrecht*, 225; own translation.

99 *Ibid.*, at 226.

100 *Ibid.*, at 226.

101 Bundesministerium für Land- und Forstwirtschaft, Umwelt und Wasserwirtschaft, *Die österreichische Strategie zur Nachhaltigen Entwicklung* (2002), available at https://www.bmk.gv.at/themen/klima_umwelt/nachhaltigkeit/strategien/nstrat.html.

102 Bundesministerium für Land- und Forstwirtschaft, Umwelt und Wasserwirtschaft, *Österreichische Strategie Nachhaltige Entwicklung (ÖSTRAT) – ein Handlungsrahmen für*

Sustainable Development Goals is addressed by the SDG-Action Plan 2019 +.¹⁰³

The Austrian National Energy and Climate Plan,¹⁰⁴ mandatory according to Regulation (EU) 2018/1999, lays down political aims and actions targeting a reduction in GHG emissions. Amongst others, it mentions citizen participation in energy generation.¹⁰⁵ At the core of the Austrian Recovery and Resilience Plan,¹⁰⁶ adopted in pursuance to the EU Regulation on the resilience facility,¹⁰⁷ lies the eco-social tax reform of February 2022.¹⁰⁸ The reform provides for, e.g., the introduction of a price for CO₂ emissions (excluding only those emissions arising from RES). For that purpose, the first part of the reform introduces in its article 9 the so-called “National Emission Certificate Trading Act 2022”.¹⁰⁹

Regarding the legislative binding production, the Austrian Climate Protection Act,¹¹⁰ as the title suggests, directly aims to protect the climate. According to its paragraph 1, the goal of the Act is to both coordinate the implementation of effective climate protection measures and safeguard compliance with international commitments concerning GHG emission reductions. For that purpose, the Act allocates GHG emission ceilings to sectors and establishes that negotiations between the *Bund* and the *Länder* have to take place to develop measures to comply with the maximum levels in the respective sectors.¹¹¹ Paragraph 7 of the same Act lays down a so-called “Climate Protection

Bund und Länder (2010), available at https://www.bmk.gv.at/themen/klima_umwelt/nachhaltigkeit/strategien/oe strat.html.

- 103 Bundesministerium für Nachhaltigkeit und Tourismus, *SDG-Aktionsplan 2019 +* (2019), available at https://www.bmk.gv.at/themen/klima_umwelt/nachhaltigkeit/strategien/sdg_aktionsplan.html.
- 104 Federal Ministry for Sustainability and Tourism Austria, *Integrated National Energy and Climate Plan for Austria* (2019), available at https://energy.ec.europa.eu/system/files/2020-03/at_final_necp_main_en_o.pdf.
- 105 G. Schnedl, *Umweltrecht*, at 148.
- 106 Bundesministerium für Finanzen, *Österreichischer Aufbau- und Resilienzplan 2020–2026* (2021), 13, available at <https://www.oesterreich.gv.at/nachrichten/allgemein/EU-Aufbauplan.html>.
- 107 Regulation (EU) 2021/241 of the European Parliament and of the Council of 12 February 2021 establishing the Recovery and Resilience Facility, OJ L 57, 18.2.2021, 17–75.
- 108 Ökosoziales Steuerreformgesetz 2022 Teil I, BGBl. I Nr. 10/2022, Ökosoziales Steuerreformgesetz 2022 Teil III, BGBl. I Nr. 12/2022, Klimabonusgesetz, BGBl. I Nr. 11/2022.
- 109 *Nationales Emissionszertifikatehandelsgesetz 2022 – NEHG 2022*, StF: BGBl. I Nr. 10/2022; own translation.
- 110 *Klimaschutzgesetz – KSG*, StF: BGBl. I Nr. 106/11 (last amendment: BGBl. I Nr. 58/2017); own translation. Yet annual limits for GHG emissions have been set only until 2020.
- 111 Para. 3 Climate Protection Act.

Responsibility Mechanism”, according to which “[t]he responsibilities in the event that the maximum quantities of greenhouse gas emissions applicable to the Republic of Austria as of 2013 are exceeded in accordance with obligations under international or EU law shall be laid down in a separate agreement”.¹¹² Linked to the Climate Protection Act, article 1 of the abovementioned National Emission Certificate Trading Act 2022 states that “[t]he objective of [... the Act] is the gradual introduction of a cost-efficient and effective measure for the reduction of greenhouse gas emissions that are not subject to EU emissions trading”.

Apart from the regulation of GHG emissions, the Austrian government has also internally transposed the Directive on the Internal Market for Electricity (IMED Directive)¹¹³ and the RED II Directive¹¹⁴ through *inter alia* the Renewable Energy Expansion Act.¹¹⁵ It is of interest, that paragraph 91 of the latter act requires the legislator to evaluate the effectiveness of the measures adopted after a period of time (so-called evaluation clauses). It stipulates that “[t]hree years after the renewables support scheme under this Federal Act comes into force, the Federal Minister for Climate Action, Environment, Energy, Mobility, Innovation and Technology shall seek the advice of external experts to evaluate it and shall present the result of such evaluation to the National Council no later than December 2024. This evaluation and reporting exercise shall be repeated every five years thereafter [...]”. Linked to the further expansion of renewable energy is also the federal Energy Efficiency Act,¹¹⁶ which aims to increase energy efficiency.¹¹⁷

The federal level has also enacted the Emission Control Act,¹¹⁸ which is of special relevance for the transport sector, since it stipulates that the

112 See para. 29 *Finanzausgleichsgesetz 2017 – FAG 2017*, StF: BGBl. I Nr. 116/2016 (last amendment: BGBl. I Nr. 10/2022), which prescribes that the cost for buying emission certificates is divided between the federal level (80 %) and the *Länder* (20%).

113 Directive (EU) 2019/944 of the European Parliament and of the Council of 5 June 2019 on common rules for the internal market for electricity and amending Directive 2012/27/EU, OJ L 158, 14.6.2019, 125–199.

114 Directive (EU) 2018/2001 of the European Parliament and of the Council of 11 December 2018 on the promotion of the use of energy from renewable sources, OJ L 328, 21.12.2018, 82–209.

115 *Erneuerbaren-Ausbau-Gesetz – EAG*, StF: BGBl. I Nr. 150/2021 (last amendment: BGBl. I Nr. 13/2022).

116 *Bundes-Energieeffizienzgesetz – EEEffG*, StF: BGBl. I Nr. 72/2014 (last amendment: BGBl. I Nr. 68/2020).

117 See e.g. para. 4 *Bundes-Energieeffizienzgesetz*.

118 *Immissionsschutzgesetz – Luft*, 1G-L, StF: BGBl. I Nr. 115/1997 (last amendment: BGBl. I Nr. 115/1997); own translation.

*Landeshauptmann*¹¹⁹ or the relevant minister has to take action if certain critical limitations are not respected.¹²⁰ Such actions can e.g. consist of speed limits and traffic restrictions enacted through administrative regulations.¹²¹ If such administrative regulations are not adopted, individuals can bring their cases to the competent court.¹²²

In the field of spatial planning, it is worth mentioning the so-called article 15 agreement between the *Länder* and the federal level on the reduction of emissions linked to buildings.¹²³ An article 15 agreement is an agreement either between all or several *Länder* or all or several *Länder* and the federal level. Such agreements are only binding on the contracting parts and, therefore, to enforce their content on individuals, the *Länder* and the federal level need to enact a specific law.¹²⁴ Furthermore, *Länder* have their own competences in the field of spatial planning, pursuant to which they have issued spatial planning laws.¹²⁵ Seven of these laws mention the climate or the protection of the climate as a principle and/or aim.¹²⁶ Similarly, the Water Law

119 President of the *Land*.

120 Para. 10 *Immissionsschutzgesetz – Luft*. See e.g. the administrative regulation *Verordnung des Landeshauptmannes vom 27. Oktober 2010, mit der auf der A 12 Inntal Autobahn ein Nachtfahrverbot für Schwerfahrzeuge erlassen wird*, StF: LGBl. Nr. 64/2010 (last amendment: LGBl. Nr. 141/2021).

121 Para. 14 *Immissionsschutzgesetz – Luft*.

122 This goes back to jurisprudence of the EJC, C-404/13 – ClientEarth, ECLI:EU:C:2014:2382. The Austrian Administrative High Court (*Verwaltungsgerichtshof*) follows the ECJ's jurisprudence, see e.g. VwGH 28.5.2015, Z1 Ro 2014/07/0096-8.

123 *Vereinbarung gemäß Art. 15a B-VG zwischen dem Bund und den Ländern über Maßnahmen im Gebäudesektor zum Zweck der Reduktion des Ausstoßes an Treibhausgasen*, StF: BGBl. II Nr. 251/2009 (amendment: BGBl. II Nr. 213/2017).

124 T. Öhlinger and H. Eberhard, *Verfassungsrecht*, 153ff.

125 *Burgenländisches Raumplanungsgesetz 2019* – Bgld. RPG 2019, StF: LGBl. Nr. 49/2019 (last amendment: LGBl. Nr. 95/2021); *Kärntner Raumordnungsgesetz 2021* – K-ROG 2021, StF: LGBl. Nr. 59/2021; *NÖ Raumordnungsgesetz 2014* – NÖ ROG 2014, StF: LGBl. Nr. 3/2015 (last amendment: LGBl. Nr. 97/2020); *Oö. Raumordnungsgesetz 1994* – Oö. ROG 1994, StF: LGBl. Nr. 114/1993 (last amendment: LGBl. Nr. 125/2020); *Salzburger Raumordnungsgesetz 2009* – ROG 2009, StF: LGBl. Nr. 30/2009 (last amendment: LGBl. Nr. 62/2021); *Steiermärkisches Raumordnungsgesetz 2010* – StROG, StF: LGBl. Nr. 49/2010 (last amendment: LGBl. Nr. 15/2022); *Tiroler Raumordnungsgesetz 2016* – TROG 2016, StF: LGBl. Nr. 101/2016 (last amendment: LGBl. Nr. 167/2021); *Vorarlberger Raumplanungsgesetz* – RPG, StF: LGBl. Nr. 39/1996 (last amendment: LGBl. Nr. 4/2022); *Bauordnung für Wien – BO für Wien*, StF: LGBl. Nr. 11/1930 (last amendment: LGBl. Nr. 70/2021).

126 Para. 1(2) No. 3 lit. b) *Burgenländisches Raumplanungsgesetz 2019*; para. 1(2) No. 1 lit. b) *NÖ Raumordnungsgesetz 2014*; Para. 2(1) No. 1 *Oö. Raumordnungsgesetz 1994*; para. 1(2) No. 4 *Bauordnung für Wien*; para. 2 para. 2 No. 4 *Salzburger Raumordnungsgesetz 2009*; para. 3(2) No. 2 lit. i) *Steiermärkisches Raumordnungsgesetz 2010*; para. 1(2) lit. l) No. 3 *Tiroler Raumordnungsgesetz 2016*.

Act¹²⁷ includes references to climate change, e.g. with regard to implications of climate change for floods.¹²⁸ Lastly, the Environmental Promotion Act¹²⁹ aims to promote measures in the fields of, e.g., water management, the environment, remediation of contaminated sites, land recycling, biodiversity and environmental protection abroad.

Against this background, we can identify two general trends regarding lawmaking. First, we can see that so-called competence coverage clauses are very often used in climate-related laws.¹³⁰ Such clauses lead to a (temporary) centralization of climate change law.¹³¹ Second, the complexity and insecurity regarding the measures taken leads to an increase in the use of evaluation clauses. Yet, it is unclear whether or not and what kind of consequences may follow from non-compliance.

4 Conclusion

The analysis of the national framework on transport, energy and water, and spatial planning has confirmed both the transversality of climate change and the need to integrate it into the strategies and legislative interventions that may have a bearing on mitigation (and adaptation) objectives. This integration might become more complex when, such as in the case of Italy and Austria, competences in the sectoral fields analyzed in this book are divided/shared between the national level and subnational authorities. Complexity is also linked to the fact that climate change is not intended as a comprehensive subject matter and, therefore, powers to legislate on climate-related issues are to be derived from more established competences in other policy fields.

Both in Italy and Austria, the need to respond to climate change is accelerating the centralization move already ongoing, especially in the fields of

127 *Wasserrechtsgesetz 1959* – WRG, 1959, StF: BGBl. Nr. 215/1959 (last amendment: BGBl. I Nr. 73/2018).

128 Para. 55i *Wasserrechtsgesetz 1959*.

129 *Umweltförderungsgesetz* – UFG, StF: BGBl. Nr. 185/1993 (last amendment: BGBl. I Nr. 26/2022); own translation.

130 See e.g. para. 1 *Elektrizitätswirtschafts- und -organisationsgesetz 2010* – ElWOG 2010, StF: BGBl. I Nr. 110/2010 (last amendment: BGBl. I Nr. 7/2022); para. 1 *Erneuerbaren-Ausbau-Gesetz* – EAG, StF: BGBl. I Nr. 150/2021 (last amendment: BGBl. I Nr. 13/2022).

131 See, in detail, S. Neudorfer, “Kompetenzdeckungsklauseln außerhalb des B-VG Österreichische Provisorienkultur oder sinnvoller Pragmatismus?”, in S. Schmid *et al.* (eds.), *Auf dem Weg zum hypermodernen Rechtsstaat?* (Jan Sramek 2011) 111–150, especially at 143.

environmental protection and water and energy, but there are some marked differences between the countries. In Italy, centralization occurs in the sense that competences shared by regions or even primary competences of regions are eroded by the adoption of environmental standards that lay down general principles or framework legislation, which then prevail over the standards adopted at regional level. In Austria, climate change law reflects the general situation of new competence matters. Generally speaking, the application of the “petrification theory” (*Versteinerungstheorie*) combined with the “intrasystematic development” (*intrasystematische Fortentwicklung*) leads to new matters being rather subsumed under a competence of the *Bund*, than falling into the competence realm of the *Länder*. Existing competences of the *Länder* are sometimes temporarily centralized through competence coverage clauses.

The comparison of the constitutional framework and practice concerning the division of competences in fields related to climate change also reveals a significant difference. While in Italy constitutional litigation over the division of competences in the sectors analyzed is high, Austria does not show the same level of contestation probably because issues concerning the division of powers were settled by the Constitutional Court in the past, and a culture of cooperation has been developing for some time.

Looking at what type of measures are adopted to integrate climate change in national policies, we have observed a mix of strategic/executive measures and legislative statutes. The latter are then usually complemented by additional regulatory measures. A general reflection is that, although climate change is in some cases not explicitly mentioned in sectoral legislation, the effects of sectoral measures on the fight against climate change are discussed in strategic documents. These documents might give a sense of policy direction that is absent in ordinary legislation, but they are not a recognized source of law either in Italy or in Austria. In Austria, strategic documents on climate change seem to be less common,¹³² but a sense of direction could also derive from so-called constitutional “state aims”.

Furthermore, although the analysis conducted in this chapter is not sufficient to evaluate the extent to which the national legislative framework on climate change is adequate to reach the mitigation objectives agreed upon at international and European levels,¹³³ it is evident that both in the case of Italy

132 Since these strategic documents are not published in the official database of Austrian laws, they are also less accessible.

133 On this point, it is interesting to note that a case was filed in Italy in June 2021 (also known as *Giudizio universale*/The last judgment), where petitioners seek a declaration that the government’s action on climate change is insufficient to reduce GHG emissions to a level

and Austria the legislative framework is very fragmented. With the climate crisis becoming more pressing, the actions taken and the legislation enacted seem to expand, which leads to further fragmentation of the field. The reasons for the fragmentation and the expansion are not only to be found in the fact that climate change is a rather young field of policy (and therefore, e.g. challenges the distribution of competences), but moreover in its complexity.

Finally, the complexity of climate change law and the urgent need to act call for effective solutions that both are based on science and may quickly react to scientific developments. In Austria, some acts introduce “evaluation clauses” for that purpose. In Italy, science is integrated into national planning but ordinary legislation is still slower to react. Responses to sudden developments are usually adopted by resorting to executive-driven legislation (adoption of D.L. or D.lgs. initiated by the government). In this sense, climate change law might even structurally change the way laws are made.

that may sufficiently limit the effects of climate change. See https://climate-laws.org/geographies/italy/litigation_cases/a-sud-et-al-v-italy.

Climate Change at Subnational Level

The Case Study of the Autonomous Provinces of Trento and Bolzano (Italy) and the Länder Tyrol and Vorarlberg (Austria)

Mariachiara Alberton, Peter Bußjäger, Alice Meier and Sara Parolari

1 Introduction

Climate change is one of the greatest challenges of our time and represents a cross-cutting and cross-sectoral question that requires prompt answers at all levels of governance, on the one hand, and effective cooperation between different public and private parties, on the other.¹

Whilst the climate targets are set and discussed at international level, their implementation falls within the scope of action of each state and, within each state, of their respective subnational entities. As highlighted in the Introduction, subnational governments may play a pivotal role in the advancement of the fight against climate change and hence represent the focus of our analysis. Indeed, subnational authorities are to be regarded as important actors, not only in respect of the implementation of international and national climate policies and regulations, but also for the adoption on their own initiative of subnational climate policies, for the integration of climate objectives in sectoral policies at subnational level and, finally, for the establishment, within their sphere of competencies, of the institutional and legal framework to deal with climate change at subnational level.

Though climate change is a global problem, its local and regional impacts vary, leaving subnational authorities that are the closest to the territory to take targeted actions. In the Alpine space, the selected case studies² of

1 M. Böcher and R. Nordbeck, "Klima-Governance: Die Integration und Koordination von Akteuren, Ebenen und Sektoren als klimapolitische Herausforderung Einführung in den Schwerpunkt der moderne staat", *Zeitschrift für Public Policy, Recht und Management*, 7 (2014) 253–268, at 257.

2 For a detailed justification of the territorial scope of the research see the Introduction in this volume.

the Autonomous Provinces of Bolzano/Bozen and Trento, in Italy, and the *Länder* Tyrol and Vorarlberg, in Austria, are geographically close and hence confronted with similar challenges on climate change action in multi-level governance systems. This circumstance may lead to different solutions or shared approaches to common problems, as regions act within the framework of their competencies and policies, and also justifies cooperation to develop coordinated approaches amongst Alpine countries.³ Indeed, the Alpine arc is exposed to comparable meteorological conditions, pollutants and human activities producing high emissions, especially in the fields of transport and tourism. Moreover, the Alpine areas perceive the effects of global warming more intensely, due to the (doubled) increase in the average warming rate, as opposed to other European geographical contexts.⁴

Although the effects of decentralization on climate change integration are still debated,⁵ in decentralized contexts, such as Austria and Italy, climate change requires coordination between different levels of government. Indeed, subnational entities such as the *Länder* in Austria, and the regions and autonomous provinces in Italy, hold exclusive or shared responsibilities with the *Bund* or the state in fields that are significant for the achievement of the internationally set climate goals.

Against this backdrop, the following analysis aims to investigate how the two Autonomous Provinces of Trento and Bolzano/Bozen and the *Länder* Tyrol and Vorarlberg address the challenges of climate change, considering which frameworks and structures have been put in place to integrate climate change policies in sectors where they exercise – exclusive or shared – legislative powers.

3 Under the framework of the Alpine Convention, European Grouping of Territorial Cooperation (EGTC), or the European Strategy for the Alpine Region (EUSALP).

4 See *Climate Action Plan 2.0* (Permanent Secretariat of the Alpine Convention 2021), at 5 and also the Introduction in this volume.

5 For a review of the different assessments of decentralization towards successful climate policies see G. Gadani, I. Galarraga and E. Sainz de Murieta, “The Importance of Regional Governments in Climate Change Policies”, *CERCIS Working Paper*, (2020), at 5.

2 The Legal Framework to Combat Climate Change at Subnational Level: An Overview

2.1 *Setting the Context: The Italian Perspective*

2.1.1 Climate Change in Light of the Constitutional Division of Competences

The Autonomous Provinces of Bolzano/Bozen and Trento enjoy unique status in the Italian legal system, comparable to a special statute region. They are entitled to exercise legislative power on a wide range of matters, some of which are exclusive, while others are *de jure* or *de facto* shared competences. The legal foundation for the provincial catalogue of competences is the Autonomy Statute of 1972 that was approved with D.P.R. 670/1972 (*Approvazione del Testo Unico delle Leggi Costituzionali concernenti lo Statuto Speciale per il Trentino-Alto Adige*), which must be read in compliance with the Italian Constitution, as reformed in 2001. Where the 2001 constitutional reform provided ordinary statute regions with a greater degree of autonomy, this has to be extended to special statute regions (and therefore the two Autonomous Provinces) as long as their statutes are not updated (the so-called “*clausola di maggior favore*” *ex* article 10, Const. L. 3/2001).

Under this legal framework, the governance of climate change is not a subject matter *per se* and, as such, is not included either in the Autonomy Statute’s catalogue of provincial competences or in the Constitution. Similarly, the governance of climate change is not contained within a single sectoral policy, but mitigation and adaptation measures are transversal to a number of other policy fields, both of provincial exclusive and shared competence (such as transport, energy, water, and spatial planning). In other words, the success of any climate policy at provincial level depends on the extent to which the two Autonomous Provinces are able to include climate-related objectives in the related sectoral policies.

In this regard, in order to evaluate how much *room for maneuver* subnational entities have compared to the center, it is essential to understand which government level holds specific competences. As explained in Chapter 2, legislation on environmental protection (and climate change, as implicitly subsumed under environment) is an exclusive national competence of the state, yet according to the Autonomy Statute of 1972, the Provinces of Trento and Bolzano/Bozen hold exclusive or shared powers over matters that overlap with environmental protection, including landscape protection, hunting, and fishing, fauna and flora protection, and forest protection (article 8). In this regard, the Court has clarified that Autonomous Provinces may only regulate those aspects explicitly mentioned by the Statute, as an overall provincial

competence on environment is not possible given the exclusive national competence in this area.⁶ However, climate change is intertwined with other policies (*infra*).

2.1.2 Allocation of Competences in the Sectors Analyzed in the Book

Besides environmental protection, relevant provincial sectoral policies that integrate climate change measures at subnational level are transport, energy and water management, and spatial planning.

Transport is a highly relevant sector when it comes to mitigation of climate change, as one of the key strategies is precisely the reduction of greenhouse gas (GHG) emissions from transportation. According to the Italian Constitution, the related competence is shared between the national and the regional levels (article 117(3) Constitution). This is the legal background when considering the ordinary statute regions. On the contrary, in the case of the two Autonomous Provinces, the legal foundation is the Autonomy Statute of 1972, which provides for their exclusive powers in regulating transportation relevant to the provincial territory (article 8, No. 18).

As in the case of transport, spatial planning is relevant when it comes to strategies for mitigation of climate change: it is a competence shared between the state and the ordinary statute regions (article 117(3) Constitution). On the contrary, according to the Autonomy Statute 1972, it is included among the subject matters where the two Autonomous Provinces exercise exclusive legislative power (article 8, No. 5).

The energy sector is crucial for climate change policy as it is directly associated with the reduction of energy consumption in relation to climate change objectives. Water policies are then strictly interrelated with energy policies because of their connection in the hydroelectric sector, a source of renewable energy and therefore a key element of climate change mitigation.⁷ Because of the Constitutional reform of 2001, the energy sector is a competence shared between the state and the ordinary statute regions. In this regard, the Constitutional Court clarified that the competence related to the energy sector as provided for in the Autonomy Statute of 1972 is narrower compared to the shared competence recognized by the Constitution for the ordinary statute regions. As a consequence, due to the provision of the above-mentioned article 10 of Const. L. 3/2001, the greater degree of autonomy in the energy sector recognized to ordinary statute regions has to be extended to special statute

6 See Corte cost. 67/2010; 387/2008; 145/2013; 58/2013; 66/2012; 225/2009.

7 For an overview of some of these sectoral policies, see W. Obwexer *et al.* (eds.), *L'impatto del diritto dell'Unione Europea sull'Autonomia dell'Alto Adige/Südtirol* (ESI 2015).

regions (and therefore the two Autonomous Provinces).⁸ This means that in the energy sector the legislative (and administrative) power is shared between the two Autonomous Provinces and the state. With the exception of the determination of fundamental principles, which are laid down in state legislation, the Autonomous Provinces may formulate energy targets (e.g., through “*Piani energetici ambientali*”), plan direct interventions, including structural ones, in the energy field, and promote and develop renewable energies (e.g., through simplified authorization processes) within their territories.

2.1.3 Climate Relevant Legal Instruments

Competences in these relevant fields are exercised through a set of legal and administrative instruments that have a direct or indirect impact on climate targets, and are issued by the Autonomous Provinces of Bolzano/Bozen and Trento either independently or following principles set by the state, in those sectors where the competence is shared. In practice this means mainly provincial legislative acts, provincial ordinances, and other programmatic and strategic acts (recent examples are examined under sections 3.1 and 3.2 of this Chapter).

As regards the Autonomous Province of Trento, L.P. 11/1995 established the Environmental and Climate Protection Agency (“*Agenzia per la tutela dell’ambiente e del clima*”), which, according to subsequent D.G.P. 647/2020, coordinates all provincial actions and initiatives on climate change (formerly coordinated through the “*Tavolo provinciale di coordinamento e di azione sui cambiamenti climatici*”, D.G.P. 1836/2010) and promotes research and education on climate change. In 2010, the Autonomous Province of Trento enacted a specific law on climate change, i.e., L.P. 5/2010 “*Il Trentino per la protezione del clima*”, eventually repealed by L.P. 19/2013 “*Legge sulla valutazione di impatto ambientale*”. In particular, according to article 23 titled “*Strategie e interventi della Provincia per fronteggiare il cambiamento climatico*”, the Autonomous Province promotes a comprehensive strategy to tackle climate change, adopting appropriate adaptation and mitigation measures within its planning and programming tools, both wide-ranging and sectorial, within the limits imposed by national, EU and international levels. L.P. 19/2013 introduces the concept of “Trentino zero emissions” by 2050 and aims at “Trentino energy self-sufficiency” by the same deadline. In addition, in 2010 the Observatory on Climate Change for Trentino was established (D.G.P. 1836/2010) as the framework for scientific and technical coordination of all provincial monitoring, research and scientific entities

⁸ The first ruling of the Constitutional Court on this issue is Corte cost. 383/2005.

dealing with climate change issues.⁹ The “*Fondo relativo al cambiamento climatico*”, renamed “*Fondo per la promozione dello sviluppo sostenibile e per la lotta ai cambiamenti climatici*”, established by the same act, provided the necessary financial resources both for the Observatory and the “*Tavolo provinciale di coordinamento*” eventually taken up by the Environmental and Climate Protection Agency. Finally, among relevant sectoral legislation, e.g., transport and energy, it is worth mentioning L.P. 6/2017 on sustainable mobility, which aims at reducing fossil fuel dependency and at fostering sustainable mobility, and L.P. 20/2012 (“*Legge provinciale sull’energia e attuazione dell’articolo 13 della direttiva 2009/28/CE*”), which aligns with the EU and national energy policy targets and promotes the use of energy from renewable sources.

As regards the Autonomous Province of Bolzano/Bozen, L.P. 26/1995 established the Provincial Environmental Agency, now known as the “Provincial Agency for the Environment and Climate Protection” (“*Agenzia provinciale per l’Ambiente e la tutela del Clima*”). L.P. 9/2018, which is the reference legislation for territory and landscape management, includes among its objectives measures for reducing net land take, giving priority to reusing and recycling land, promoting energy efficiency and renewable energies, and for preventing and protecting against natural hazards. As for the energy sector, L.P. 9/2010, as amended by L.P. 10/2018 and L.P. 1/2022, includes provisions on energy efficiency, renewable energies and climate protection. In particular, in line with national legislation, it prescribes a single authorization process for the construction and management of renewable energy plants and a simplified authorization process for small-scale renewable energy plants. In the water sector, an abundance of provincial laws have been adopted, since this is an area of shared competence, in compliance with the provisions enacted by the state, such as the more recent Presidential Decree of June 2017 “General Plan for the Use of Public Water” (“*Piano generale utilizzazione acque pubbliche*”), which implements the integrated and coordinated approach to water management introduced at EU level by the EU Water Framework Directive (2000/60/EC) and establishes a framework for the assessment and management of flood risks as required by the Floods Directive (2007/60/EC).¹⁰

9 The Observatory is formed by the following provincial bodies and research entities: *Dipartimento Protezione civile*, *Fondazione Edmund Mach*, *Agenzia provinciale per la protezione dell’ambiente*, *Università degli studi di Trento (DICAM)*, *Museo delle Scienze (MUSE)*, *Fondazione Bruno Kessler*, *Comitato glaciologico trentino della SAT*.

10 For an overview of the evolution of water management and protection in Italy prior to as well as after the implementation of the Water Framework and the Floods Directives, see M. Alberton, “Water Governance in Italy: From Fragmentation to Coherence through Coordination Attempts”, in P. Turrini *et al.* (eds.), *Water Law, Policy and Economics in*

2.1.4 The Role of Municipalities

Local autonomy in Italy is entrenched in the Constitution: municipalities are considered autonomous constituent units of the Republic (article 114(2) Constitution). They have no legislative power, and carry out their own, as well as delegated, administrative functions, as defined by national or regional/provincial law, unless these same functions are assigned to the upper levels of government in line with the principles of subsidiarity, differentiation, and proportionality (article 118 Constitution).

Against this general framework, the Autonomous Provinces of Trento and Bolzano/Bozen are vested (as are all special regions) with an exclusive legislative competence over the system of local entities, unlike the ordinary regions, where this competence is attributed to the state level.

With regard to climate issues, the importance of municipalities in achieving the objectives of reducing emissions and increasing energy production from renewable sources is recognized. An example of local level involvement is the Covenant of Mayors initiative for climate and energy,¹¹ where the Autonomous Province of Trento acts as coordinator of several municipalities (including the City of Trento), which joined together and adopted a sustainable energy action plan (“*Piano d’azione per l’energia sostenibile*”).¹² The Municipality of Bolzano joined the Covenant of Mayors initiative in 2009 and adopted the “*Piano di Azione per l’Energia Sostenibile e il Clima*” in 2020.¹³ Within the Autonomous Province of Bolzano/Bozen, each municipality has the duty to develop a climate protection and energy saving plan, setting strategies and objectives to be reached at local level.¹⁴ As an example, the Municipality of Bolzano has recently achieved “Gold Certification” as part of the *ComuneClima* initiative¹⁵ (based on the European Energy Award), which aims to support and reward

Italy: Between National Autonomy and EU Law Constraints (Springer 2021) 355–368, at 355ff.

11 See Chapter 1 in this volume.

12 More information available on the Autonomous Province of Trento website (<https://www.comune.trento.it/Aree-tematiche/Ambiente-e-territorio/Energia-sostenibile/Patto-dei-sindaci>).

13 More information available on the Autonomous Province of Bolzano/Bozen website (https://www.comune.bolzano.it/ambiente_contexto2.jsp?ID_LINK=4988&area=68).

14 See the Piano Clima Alto Adige 2040, published by the Autonomous Province of Bolzano, at 35 (<https://ambiente.provincia.bz.it/energia/piano-clima-energia-alto-adige-2050.asp>).

15 See <https://www.agenziacasaclima.it/it/comuneclima-1559.html>.

municipalities that are committed to sustainable local energy policy and development.

2.2 *Setting the Context: The Austrian Perspective*

2.2.1 Climate Change in Light of the Constitutional Division of Competences

The *Länder* Tyrol and Vorarlberg hold symmetric, constitutionally entrenched, legislative and executive powers, and share competences with the *Bund* in sectors relevant for climate change. The Austrian Federal Constitution (*Bundesverfassungsgesetz* B-VG) allocates competences between the *Bund* and the *Länder* in its articles 10 to 15.

Specifically, according to the residual clause in article 15(1) B-VG, all competences that are not explicitly assigned to the *Bund* in legislation or in execution, fall within the autonomous sphere of competences of the *Länder*. Certainly, there is a clear dominance of competences of the *Bund*.¹⁶

The B-VG does not expressly mention climate protection or adaptation to climate change.¹⁷ According to the unanimous legal constitutional doctrine, climate protection rather represents a typical “*Querschnittsmaterie*”, or cross-cutting-subject matter, falling within the spheres of competence of both *Bund* and *Länder* in intersecting policy areas. Consequently, first and foremost, it must be examined whether the single measure to be taken in the interest of climate protection, or the targeted source of emission, falls within any specific competence field mentioned in the Federal Constitution. If this is the case, the *Bund* may have legislative powers on the grounds of article 10 (exclusive legislation *Bund*, execution *Bund*), article 11 (exclusive legislation *Bund*, execution *Länder*), article 12 (framework legislation *Bund*, implementing legislation and execution *Länder*). In exceptional cases, certain matters are also explicitly assigned to the *Länder*, for example “prevention of air pollution regarding heating” in article 10(1) No. 9 B-VG. In all other cases, the *Länder* are competent on the basis of article 15(1) B-VG in legislation as well as in execution.

The described distribution of competences also opens up the opportunity for federal innovations and mutual learning in fields related to climate change: for instance, *Land* Niederösterreich banned the installation of new oil

16 P. Bußjäger, “Austria’s Cooperative Federalism”, in G. Bischof and F. Karhofer (eds.), *Austrian Federalism in Comparative Perspective* (The University of New Orleans Press 2015) 11–33.

17 However, Austria is committed to comprehensive protection of the environment through a federal constitutional law of 2013, which introduces so-called *Staatszielbestimmungen*, i.e. state environmental aims (BVG *Nachhaltigkeit* BGBl. I 2013/111).

heating systems from the beginning of 2019. In the same year, the federal legislator passed a law banning new oil heating systems in new buildings in the whole of Austria.¹⁸

When it comes to the execution of laws, it should be noted that all laws passed by the *Bund* on the basis of article 10 B-VG have to be implemented within the sphere of influence of the *Länder* by the *Land* Governor and his subordinated *Land* authorities (indirect federal administration), according to article 102(1) B-VG, with the exception of certain competences enumerated in article 102(2) B-VG (direct federal administration). Regarding climate protection, most areas of competence (for example industry, prevention of air pollution, traffic) are to be administered through indirect federal administration.

Furthermore, it should be noted that the constitutional division of competences does not apply where the *Bund* or the *Länder* act as holders of private rights, pursuant to article 17 B-VG. This means that the federal government and the *Länder* are allowed to act beyond their constitutional jurisdictional boundaries within this framework. The term that is commonly used in the Austrian legal system to describe this type of administration is "*Privatwirtschaftsverwaltung*". This is particularly relevant when it comes to promoting climate-friendly behavior of individuals. For example, local public transport is mostly administered by way of subsidies, and in the field of climate protection many *Land* measures are taken based on article 17 B-VG. When federal or *Land* authorities base their actions on article 17 B-VG, no legal foundation is necessary, as long as there is a dedicated budget position. However, often, detailed regulations on laws or ordinances in the area of climate protection are laid down in internal guidelines that have no external effect, binding the administration internally only, especially in those matters where the authorities act on the basis of article 17 B-VG. Such internal guidelines specify, for example, the circumstances under which certain projects are to be supported financially.

2.2.2 Allocation of Competences in the Sectors Analyzed in the Book
Pursuant to article 15 B-VG, the *Länder* are competent for spatial planning with the exception of the federal competences in infrastructural matters (railroads, motorways, air traffic). Spatial planning for the *Länder* includes competences in legislation and administration. However, the fact that the execution of the single spatial planning laws is handled by municipalities in their autonomous sphere of action (article 118 B-VG) should not be overlooked.

18 *Ökoesseleinbauverbotsgesetz ÖKEVG 2019*, BGBl. I Nr. 6/2020.

As for transport, the competences of the *Bund* are predominant. Indeed, the *Bund* regulates highway patrol (article 11(1) No. 4 B-VG) and the infrastructure of motorways (article 10(1) No. 9 B-VG) and, most importantly, motor traffic matters (article 10(1) No. 9 B-VG). These laws are executed by *Land* authorities either within their autonomous administration (e.g. highway patrol – article 11(1) No. 4 B-VG) or, as mentioned above, via indirect federal administration, pursuant to article 102 (1) B-VG, by the *Land* Governor and his subordinated *Land* authorities, in compliance with the instructions of the competent federal minister.

The water sector is also substantially embedded in federal competencies, pursuant to article 10(1) No. 10 B-VG. Competences in the energy sector, however, are shared between the *Bund* and the *Länder*. Matters concerning electricity, where these are not matters of exclusive federal competency pursuant to Article 10 B-VG article 12(1) No. 2 B-VG, fall into so-called framework legislation, which means that the *Bund* is competent to legislate on the principles and the *Länder* to enact laws to execute these. All other agendas in the subject matter of energy fall within the sphere of competence of the *Bund*, both with regard to legislation and execution.

Finally, with specific regard to climate protection, the aforementioned article 17 B-VG plays a particularly important role. The federal government and the *Länder* (but also the municipalities on the basis of article 116 B-VG) have developed numerous funding programs related to climate protection. In the case of the *Länder*, this concerns for example measures related to the climate-friendly construction of buildings or the promotion of cycling. The funding programs are run either by federal or *Land* authority agencies and other institutions.

2.2.3 Climate Relevant Legal Instruments

The essential legal instruments for implementing climate protection are federal, and *Länder* laws are adopted on the basis of the illustrated allocation of competences. These laws are further specified by ordinances of federal (for example federal minister for climate protection) or *Land* authorities (for example the *Land* government). Moreover, in both *Länder* the recognition of the urgency of the climate question has led to the constitutional entrenchment of sustainable and effective climate protection as goals, or better, as state aims (*Staatszielbestimmungen*) of the *Land*.¹⁹ However, against the background of

19 See article 7(7) of the Constitution of Vorarlberg (LGBl. Nr. 16/2008) and article 7(3) of the Tyrolean Constitution (LGBl. Nr. 133/2019).

the restrained jurisprudence of the Constitutional Court, such state goals are merely general guidelines for action, without direct normative effect.

As for legislative responses to climate change at *Land* level, it should be noted that there are no dedicated climate laws in the two *Länder*. However, climate protection has been integrated by the *Länder* into their sectoral laws (e.g. in air pollution laws, energy laws, spatial planning laws²⁰ and building sector regulations²¹).

Finally, agreements based on article 15a of the Federal Constitution (described in more detail in Chapter 7) play a very important role in coordination between the federal government and the *Länder* (for example the Agreement between the federal government and the *Länder* pursuant to article 15a B-VG on measures in the building sector for the purpose of reducing greenhouse gas emissions of 2009). Such agreements are applied in the manner of state treaties between the *Bund* and the *Länder* or between the *Länder* themselves. They oblige the partners to implement the contents of the agreement in their respective legal systems and competences. If these agreements intend to bind the legislator, which is usually the case, they require the approval of the lower house of the Austrian Parliament (National Council), if the *Bund* is involved, as well as the *Land* parliaments.

2.2.4 The Role of Municipalities

From a constitutional design point of view, municipalities are also authorized to act as holders of private rights pursuant to article 116 (2) B-VG and are therefore entitled to exercise their own “*Privatwirtschaftsverwaltung*” (see above). Moreover, municipalities may act within their autonomous sphere of competences, as outlined by article 118 B-VG. For example, considering the subject matters listed as explicitly falling within the scope of action of municipalities pursuant to article 118(3), they may take action in local spatial planning and the management of traffic areas of the municipality, which might have essential effects on climate change protection. This means that the *Land* administrations only exercise supervisory functions and are not allowed to give binding instructions to the municipalities. Accordingly, actions to implement climate change mitigation or adaptation can be adopted in fields that are a prerogative for municipalities.

20 See, for instance, the spatial planning aims in the spatial planning law of Vorarlberg (article 2) and article 11 introducing mandatory municipal development plans under consideration of climate change impacts, *Gesetz über die Raumplanung* – LGBL.Nr. 39/1996.

21 See, for instance, the building requirements and directives in the Tyrolean Building Code (articles 18 and 21), *Tiroler Bauordnung* (2018) TBO, LGBL. Nr. 28/2018.

Specifically, regarding local spatial planning, a few institutional interviewees highlighted the fact that the role of municipalities in this sector requires additional coordination efforts and targeted information activities from the *Land* administration to avoid discrepancies in implementation, including climate-relevant measures.²² In both the water and spatial planning sectors, the institutional interviewees reported that the respective departments voluntarily initiate specific training to harmonize and guide implementation at municipal level.²³ In the transport sector, the coordination unit for mobility management of *Land Vorarlberg* coordinates mobility management activities within the framework of an information exchange platform between the *Land*, municipalities and other relevant institutions.²⁴

The empirical evidence collected shows that both *Länder* and the *Bund* offer a number of funding options and consultancy to municipalities to support them in their implementation of climate measures. As a matter of fact, cooperation between municipalities and the collective adoption of climate actions occurs within the framework of programs funded by the *Bund* and the *Länder* such as the *e-5 Gemeinden* program, the *KEM (Klima- und Energiemodellregionen)* and the *KLAR! (Klimawandel-Anpassungsmodellregionen)* programs. Another noteworthy platform for cooperation is offered by the Climate Alliance (*Klimabündnis*) between Austrian municipalities. These mechanisms can also be seen as manifestations of multi-level governance in the Austrian legal system.²⁵

Municipalities and cities also act independently in relation to climate change, developing their own climate concepts and measures. For example, the city of Innsbruck in Tyrol and the municipality of Feldkirch in Vorarlberg have adopted their own strategies for climate change adaptation. Moreover, a number of municipal councils in both *Länder* have declared a state of climate emergency, including the municipality of Kufstein (in 2019) in Tyrol and the city of Bregenz (in 2021) in Vorarlberg. However, the legal consequences of such resolutions are questionable, especially in terms of enforceability. Declaring a climate emergency may be effective in terms of media coverage

22 IntT_03; IntV_02.

23 IntT_03; IntT_05.

24 IntV_05.

25 See also P. Bußjäger, "Multi-Level-Governance als Gegenstand und Herausforderung des Öffentlichen Rechts", *ZÖR*, 71 (2016) 307–330.

and raising awareness amongst the public, yet the resolutions have only symbolic legal effect and do not trigger any actual obligations to act.²⁶

3 The Development of the Climate Policy at Subnational Level in the Selected Case Studies

3.1 *Climate Change Policy in the Autonomous Province of Trento*

3.1.1 The Development of the Subnational Climate Policy

As mentioned in section 2.1, according to article 23 of L.P. 19/2013, the Autonomous Province may adopt strategies to tackle climate change and may introduce appropriate adaptation and mitigation measures within its planning and programming tools. In 2021 the Autonomous Province of Trento adopted the scoping paper “*Trentino Clima 2021–2023*” (D.G. 1306/2021), a workplan coordinated by the Environmental and Climate Protection Agency, and leading to the approval of the provincial strategy for mitigation and adaptation to climate change (“*Strategia Provinciale di Mitigazione e Adattamento ai cambiamenti climatici*”) by the end of 2023.²⁷ This strategy should represent the future blueprint to guide all provincial administrative actions, identifying the measures to be integrated into the planning and programming of various policy sectors in a coherent and coordinated manner. The workplan “*Trentino Clima 2021–2023*” also contains the proposal for a governance system coordinated by the Environmental and Climate Protection Agency, based on a new Observatory on Climate Change for Trentino²⁸ that would include: i) the provincial Table of coordination and action on climate change (formerly the “*Tavolo provinciale di coordinamento e di azione sui cambiamenti climatici*” coordinated by the Agency, see section 2.1 of this Chapter), composed of different sectoral provincial departments dealing with climate issues;²⁹ and ii) a Scientific Committee,

26 J. Fitz *et al.*, “Klima, Luft und Mobilität”, *juridikum*, 4 (2019), at 510. For an investigation into the possible relevance and influence of the political impetus on climate change integration see Chapter 7 in this volume.

27 See “*Trentino Clima 2021–2023: Programma di lavoro sui cambiamenti climatici della Provincia Autonoma di Trento*” (available at http://www.climatrentino.it/notizie_clima/pagina187.html).

28 See http://www.climatrentino.it/chi_siamo/osservatorio_trentino_clima/.

29 These are: *Dipartimento territorio ambiente energia e cooperazione*, *Agenzia provinciale per le risorse idriche e l'energia*, *Dipartimento protezione civile foreste e fauna*, *Dipartimento istruzione e cultura*, *Dipartimento agricoltura*, *Dipartimento sviluppo economico ricerca e lavoro*, *Dipartimento salute e politiche sociali*, *Dipartimento infrastrutture e trasporti* and *Dipartimento artigianato, commercio, promozione, sport e turismo*.

composed of representatives of the research and scientific provincial entities (i.e. University of Trento, E. Mach Foundation, B. Kessler Foundation, Museum of Sciences and Hub Innovation Trentino). The governance system would be complemented by the “*Forum provinciale per i cambiamenti climatici*”, composed of different provincial entities (e.g., Environmental and Climate Protection Agency, scientific provincial entities, etc.) and aimed at promoting public participation in climate change issues at local level.

Moreover, following the adoption of the national Strategy for Sustainable Development of 2017, in 2021 the Autonomous Province of Trento adopted the provincial Strategy for Sustainable Development (“*Strategia provinciale di Sviluppo Sostenibile – SproSS*”),³⁰ which identifies twenty provincial sustainability objectives, grouped into five areas in line with the five EU policy objectives³¹ for supporting growth for the period 2021–2027: 1) a smarter Trentino, 2) a greener and climate neutral Trentino, 3) a more connected Trentino, 4) a more social Trentino, and 5) a Trentino closer to citizens. This strategy indicates the path to follow in order to build a sustainable territory, explicitly based on energy transition and adaptation to climate change, and represents the overarching framework within which the provincial Strategy of mitigation and adaptation to climate change “*Strategia Provinciale di Mitigazione e Adattamento ai cambiamenti climatici*” lies.

3.1.2 Integration of Climate Change in Sectoral Policies

Beyond the Province’s overall strategic framework, climate change objectives are also included, to varying degrees, in the specific relevant sectoral strategies.

With regard to transport,³² the main strategy with an impact on climate change is the Provincial Plan for Electric Mobility (“*Piano Provinciale per la Mobilità Elettrica*”) approved in 2017. The targets explicitly referring to climate change are: GHG emissions reduction, reduction of emissions released into the atmosphere by the transport sector (e.g., CO₂, PM₁₀, PM_{2.5}, NO₂, etc.), and making Trentino a more attractive territory in terms of emissions reduction and quality of the environment.

30 Available at <https://agenda2030.provincia.tn.it/Trentino-2030/Strategia-provinciale-SproSS>.

31 The 2021–2027 EU cohesion policy objectives are: 1) a more competitive and smarter Europe; 2) a greener, low-carbon transitioning towards a net zero carbon economy; 3) a more connected Europe by enhancing mobility; 4) a more social and inclusive Europe; 5) Europe closer to citizens by fostering the sustainable and integrated development of all types of territories.

32 More information available on the Autonomous Province of Trento website (<https://pianoaria.provincia.tn.it/II-Piano/Settori-di-intervento/Trasporti-e-mobilita-sostenibile>).

In the energy sector, in 2021 the Autonomous Province adopted the Provincial Environmental Energy Plan 2021–2030 (*“Piano Energetico Ambientale Provinciale – PEAP”*) which outlines in general terms the provincial mitigation strategy objectives, in line with L.P. 19/2013: 50% of emissions reduction by 2030, updated to 55%, as prescribed by the new EU Climate Law, as well as increasing energy efficiency and use of renewable energies in all relevant sectors, e.g. public and private buildings, industry and mobility. In the water sector, the Plan for the General Management and the Use of Public Water (*“Piano di gestione generale dell'utilizzazione delle acque pubbliche”*) adopted in 2006 does not include references to climate change issues; however, the preliminary version of the Plan for Water Protection *“Piano di Tutela delle Acque 2022–2027”*, approved in 2021, includes a specific attachment (i.e. *“Allegato M”*) on climate change impacts and effects, future scenarios and a series of proposed actions for adaptation to be implemented within the Autonomous Province territory.³³

In the spatial and urban planning plans, no specific reference is made to climate change. However, in the document *“Il futuro della città di Trento si costruisce oggi. Obiettivi e percorso della variante generale del Piano Regolatore generale”*, approved by the Municipal Council of Trento in 2018, the goals of prospective revisions of the general plan include coordinating urban planning uses with environmental topics in light of climate change impacts.³⁴

3.2 *Climate Change Policy in the Autonomous Province of Bolzano/Bozen*

3.2.1 The Development of the Subnational Climate Policy

As mentioned, the Autonomous Province of Bolzano/Bozen has not yet issued a specific legislative act on climate change, but has defined its overall, cross-cutting vision in the South Tyrol Climate Plan 2040 (*“Piano Clima Alto Adige 2040”* or *“Klimaplan Südtirol 2040”*), issued in 2011 and later revised. The Strategy focuses primarily on mitigation measures, while leaving the definition of adaptation objectives and measures to sectorial plans and legislative acts. The measures are grouped along several axes: energy supply and smart energy management; rational and smart use of energy; building renovation and

33 More information available on the Environmental Protection Agency website (http://www.appa.provincia.tn.it/pianificazione/Piano_di_tutela/pagina36.html).

34 More information available on the Municipality of Trento website (<https://www.comune.trento.it/Aree-tematiche/Ambiente-e-territorio/Urbanistica/Il-nuovo-PRG-Piano-regolatore-generale>).

construction; environmentally-friendly use of renewable energy; general prevention measures for climate protection; participation, innovation and transfer of know-how. The Strategy defines the main strategic axis of intervention at provincial level in all the relevant sectors, and incorporates the principles enshrined at international, European and national level, applying them downwards at the provincial level. An update of this strategy is currently under discussion and aims to introduce a wide range of measures to reduce the climate impact of the provincial energy system.³⁵ The revision process included a public participatory phase, which closed at the end of 2021.³⁶ The provincial Agency for Environment and Climate Change plays a coordinating role for the provincial administrations involved.

In 2021, the provincial government published a concept paper on sustainability titled “Every day for future – *Insieme per la sostenibilità*”, with the aim of developing a common strategic program for sustainable development. A participatory process has also been foreseen for the elaboration of this strategy.³⁷

3.2.2 Integration of Climate Change in Sectoral Policies

Besides the above-mentioned overall strategy, the provincial climate policy is also implemented at sectoral level.

As regards transport, it is worth mentioning the Green Mobility initiative, dating back to 2012, which has the objective of promoting a better quality of life for residents and tourists, together with the promotion of electric mobility. Subsequently, the public company Green Mobility Alto Adige was created by the Autonomous Province of Bolzano with the aim to bring together different actors, and it took the lead in creating new green initiatives, such as the installation of charging stations for electric cars.

The main frame of reference for energy policy is contained in the above-mentioned Climate Plan South Tyrol 2040 and is currently under revision. Furthermore, a relevant initiative is “*Casa Clima*”, a centre of excellence for energy-efficient and sustainable construction and renovation, founded in 2002, which developed a method of energy efficiency certification for houses and buildings. It was expanded in 2014 to become the Energy Agency South

35 The new draft is available online at <https://www.klimaland.bz/it/piano-clima-alto-adige-2040/>.

36 More information available on the Autonomous Province of Bolzano/Bozen website in the footnote above. See also Chapter 9 in this volume.

37 More information available on the Autonomous Province of Bolzano/Bozen website (<https://nachhaltigkeit.provinz.bz.it/il-progetto>). See also Chapter 9 in this volume.

Tyrol – Casa Clima, a public body of the Autonomous Province of Bolzano established to accompany the territory towards the objectives indicated in the above-mentioned Climate Strategy. The main strategy on water is contained in the General Plan for the Use of Public Water (“*Piano generale di utilizzazione delle acque pubbliche*”), already described in section 2.1.3 of this Chapter.

In the spatial planning sector, the Provincial Plan for Development and Territorial Coordination (“*Piano provinciale di sviluppo e coordinamento territoriale – LEROP*”) has been issued with the final aim to integrate key energy policy visions into overall land development planning. The Plan is currently under revision.

3.3 *Climate Change Policy in Land Tyrol*

3.3.1 The Development of the Subnational Climate Policy

The first acknowledgment of climate awareness in policymaking in Tyrol, considering the relevant research timeframe (2005 and onwards), can be traced back to the first energy strategy adopted in 2007.³⁸ Subsequently, in 2014 the *Land* government committed to reaching energy autonomy and climate neutrality at subnational level by 2050, by launching the “*Tirol 2050*”³⁹ program.

Tyrol was the first among the Austrian *Länder* to introduce its own sustainability strategy⁴⁰ in 2012, which deals with sustainable development in the broader sense, also by establishing sectoral objectives to enhance sustainability, and only incidentally addresses climate change mitigation and adaptation as one of the fields of action. Specifically, the strategy anticipates the need to develop climate strategies and identifies the room for manoeuvre of the *Land*, both in terms of climate protection and adaptation to climate change, by listing already adopted initiatives and setting future objectives.

The adoption of a dedicated climate policy framework, i.e. the Tyrolean Climate Protection and Climate Change Adaptation Strategy, acknowledged by the *Land* government in May 2015,⁴¹ represents a milestone in the development of the subnational climate policy. However, a few institutional respondents interviewed for this research expressed the need for more concreteness, both

38 Amt der Tiroler Landesregierung, *Tiroler Energiestrategie 2020 – Grundlage für die Tiroler Energiepolitik* (2007).

39 <https://www.tirol2050.at/>.

40 *Land* Government Resolution of 24 April 2012: *Leben mit Zukunft – Tirol nachhaltig positionieren*.

41 Amt der Tiroler Landesregierung, *Tiroler Klimaschutz- und Klimawandelanpassungsstrategie* (2015).

in policy design and implementation.⁴² The newly published Sustainability Strategy of 2021, which includes the updated Climate Strategy for *Land Tyrol*,⁴³ would target a more implementation-oriented approach towards the year 2030, with objectives and recommendations for each sector. The latter strategy was also preceded by a broader participatory process involving the general public and different relevant stakeholders, and was regarded as the future policy framework for climate action at subnational and local level.

3.3.2 Integration of Climate Change in Sectoral Policies

Climate change is further addressed specifically in a number of sectoral policies of *Land Tyrol*. Moreover, climate change mainstreaming measures targeting behavioural change have been put in place in all the sectors analysed in this book.

In particular, in the transport sector, aside from infrastructural initiatives, climate change was initially addressed at the strategic level in the mobility program and a sectoral framework strategy was adopted in 2008 and later updated in 2013 and 2022.⁴⁴ Sectoral efforts focus on influencing individual transport choices with the aim of reducing motorized individual transport by increasing the attractiveness of public transportation and implementing the transition to climate friendly mobility. A mobility coordinator has also been established as project manager for the purpose of implementing the program and to support decision-makers in considering sustainable mobility and climate protection in relevant decision processes.

Climate was clearly addressed in the energy and water sector in the energy strategy of 2007 and in the aforementioned energy autonomy program "*Tirol 2050*". A further sectoral development is represented by the recently published hydrogen strategy 2030,⁴⁵ aimed at enhancing decarbonization, especially in the transport sector. The sectoral policies aim to increase energy efficiency, enhance the use of renewable energy sources and foster climate friendly energy choices also by private individuals.

Finally, in the spatial planning field, the two framework spatial development plans for *Land Tyrol* ("*Zukunftsraum Tirol*" and "*Lebensraum Tirol 2030*"),

42 IntT_01; IntT_02.

43 Amt der Tiroler Landesregierung, *Leben mit Zukunft – Tiroler Nachhaltigkeits- und Klimastrategie* (2021).

44 Amt der Tiroler Landesregierung, *Tiroler Mobilitätsprogramm 2008–2013* (2008); *Tiroler Mobilitätsprogramm 2013–2021* (2013); *Tiroler Mobilitätsprogramm 2022–2030* (2022).

45 Lebensraum Tirol Holding GmbH, *Wasserstoff-Strategie Tirol 2030* (2021).

adopted by the Tyrolean government respectively in 2011 and in 2019,⁴⁶ specifically address the contribution of the sector to climate protection and adaptation to climate change. In particular, the two policy frameworks identify sectoral challenges linked with climate change, such as the development of climate friendly energy planning in municipalities and the promotion of regional renewable energy sources.

The analysed sectoral papers generally address the subject of climate change integration by expressly declaring that single measures are adopted for the purpose of either reducing sectoral GHG emissions or adapting to the consequences of climate change and to contribute to the implementation of international obligations.

3.4 *Climate Change Policy in Land Vorarlberg*

3.4.1 The Development of the Subnational Climate Policy

Vorarlberg has a long-standing tradition of climate policy, as testified by its moves towards the early constitutional entrenchment of climate protection in 2008.⁴⁷ It should be stressed that climate awareness in policymaking in Vorarlberg clearly originates in the energy sector. Notably, Vorarlberg acted as frontrunner amongst the Austrian *Länder*, having committed as early as 2009 to reaching energy autonomy by 2050 – that is years ahead of the Paris Agreement of 2015 – as a result of the unanimous resolutions of the Parliament of Vorarlberg (*Landtag*) in 2007 and 2009.⁴⁸ The energy autonomy program was initiated with a broad participatory vision process in 2007, which set the foundations for decarbonization at subnational level and culminated in the adoption of one hundred and one measures in 2011,⁴⁹ to be implemented by 2020. The latest update in the program took place in 2021 with the adoption of the Energy Autonomy Strategy +⁵⁰ (*“Energieautonomie +”*), with an implementation horizon running until 2030. This paper represents a comprehensive concept, which bundles sectoral climate change mainstreaming efforts beyond the energy sector, also targeting other sectoral emissions. During the interviews, the latter strategy was regarded as the future common frame of

46 Resolution of the *Land* Government of 27 September 2011: *Zukunftsraum Tirol 2011*; Amt der Tiroler Landesregierung, *Lebensraum Tirol Agenda 2030* (2019).

47 See article 7(7) of the Constitution of Vorarlberg (LGBL. Nr. 16/2008).

48 Vorarlberger Landtag, *Energiezukunft Vorarlberg*, Resolution, Beilage 34/2007 and *Energieautonomes Vorarlberg*, Beilage 75/2009.

49 Amt der Vorarlberger Landesregierung, *Schritt für Schritt zur Energieautonomie in Vorarlberg. 101 enkeltaugliche Maßnahmen* (2011).

50 Amt der Vorarlberger Landesregierung, *Strategie Energieautonomie + 2030 Klimaschutz in Vorarlberg umsetzen* (2021).

reference for climate change mitigation, which was developed with the cooperation of the responsible sectoral departments and preceded by the involvement of relevant stakeholders and the population.⁵¹

As for adaptation to climate change, in 2016 the *Land* government introduced a dedicated policy framework: the Strategy for Adaptation to Climate Change in Vorarlberg.⁵² The strategy contains general recommendations (Chapter 3) and is further subdivided into sectoral sub-strategies (Chapter 4), each containing a bundle of sectoral objectives and implementation targets. This strategic framework is further complemented with yearly updated action plans, also containing sectoral measures.

Recently, the calls for actions by policymakers led the *Land* parliament to declare a state of climate emergency in Vorarlberg in 2019, based on an independent motion presented to the *Landtag* by representatives of the Green Party (exhibit 89/2019) and inspired by the analogous motion 935/A presented in the National Council. The state of emergency abstractly entails a preventive “climate-check” of government proposals for *Land* laws, regulations, and directives for grants in terms of climate change adaptation and mitigation.⁵³

3.4.2 Integration of Climate Change in Sectoral Policies

Besides the above-mentioned framework strategies, climate policies also develop at sectoral level through the integration of climate change objectives into sectoral papers and the adoption of concrete measures.

As previously highlighted, the energy sector has experienced significant development since the initiation of the first energy autonomy program up until the recent adoption of the new autonomy strategy in 2021, which contains a bundle of sectoral measures, developed in synergy with the responsible departments. For instance, with regard to mobility, the strategy targets the reduction of emissions from road, rail and air traffic by expanding public infrastructure to charge electric vehicles and funding private charging infrastructure and investing in mobility management training for private individuals, municipalities and schools.

Climate change was also addressed as a major focus for action in the cornerstone strategies in the transport sector, especially the mobility concept of 2019⁵⁴ and in other strategies, such as the e-mobility strategy (2015)⁵⁵ and the

51 IntV_05; IntV_06.

52 Amt der Vorarlberger Landesregierung, *Strategie zur Anpassung an den Klimawandel in Vorarlberg – Ziele, Herausforderungen und Handlungsfelder* (2015).

53 IntV_02; IntV_03.

54 IntV_05.

55 Amt der Vorarlberger Landesregierung, *Elektromobilitätsstrategie Vorarlberg* (2015).

bicycle concepts (2013 and 2016). The recognizable trend is the introduction of catalogues of measures to be adopted in the different policy areas of mobility (public transport, e-mobility, and alternatives to the use of private vehicles) with the declared intent of reducing sectoral emissions.

Moreover, policymakers in Vorarlberg recognized the need to intervene in the freight transport sector by developing a climate-friendly strategic framework, which is still in progress.⁵⁶ Finally, the spatial development plan for *Land Vorarlberg*, “*Raumbild 2030*”, preceded by a structured participatory process, specifically accounts for the consequences of climate change in a number of sectoral measures. Examples include the reservation of green zones and open spaces in settlement areas and the provision of training for actors at the municipal and regional level for the purpose of developing climate-adequate local spatial planning concepts.

4 Concluding Remarks

Although the two Autonomous Provinces of Trento and Bolzano/Bozen, on the one hand, and Tyrol and Vorarlberg, on the other, are embedded in different constitutional structures, there are various similarities, specifically concerning the legal frameworks to combat climate change at subnational level. In both Italy and Austria, there are certain competences at subnational level, some of which are exclusive, while others are to a certain extent of a shared nature.

In both countries, the governance of climate change does not represent a subject matter *per se*. Consequently, it is not included in the catalogue of provincial competences in the Autonomy Statute or in the Constitution, in Italy, or exclusively assigned to either the *Bund* or the *Länder*, in Austria. Similarly, the governance of climate change is not contained in a single sectoral policy, but climate measures are transversal to a number of other policy fields, reflecting both provincial and *Land* competences. As a consequence, the question of which national or subnational entity holds the competences needs to be answered on a case-by-case basis by analysing the content of selected measures or climate-related strategies. The resulting competencies may lie in the exclusive or shared sphere of operations of either level or of both levels. The success of climate policies at provincial or *Land* level is hence strictly related to the extent to which the Provinces or the *Länder* have the competence to concretely include climate-related objectives in their sectoral policies.

⁵⁶ <https://vorarlberg.at/-/gueterverkehrskonzept-vorarlberg>.

Despite the fact that Austria is constituted as a *Bund*, the Autonomous Provinces of Bolzano/Bozen and Trento enjoy a comparatively wider range of competences than Tyrol and Vorarlberg in some of the fields of impact analysed in terms of climate change. For example, in Italy, in the fields of transport, energy and water, we find shared competences between the state and the regions, whereas the legislative competences with regard to transportation in the provincial territory are vested in the Autonomous Provinces. In Austria, transport and water management are exclusive competences of the *Bund* in legislation, but are also part of indirect federal administration (i.e. the execution is by *Land* authorities bound to the directives of the competent federal ministry).

In Austria it should be further highlighted that both the *Bund* and the *Länder* have the option to act as holders of private rights, pursuant to Article 17 B-VG, and hence are allowed to act in a competence-neutral framework (“*Privatwirtschaftsverwaltung*”). This circumstance allows the considered entity to take multiple initiatives to advance the fight against climate change, by going beyond the constitutional boundaries of competence and by operating based on arrangements governed by private law, for example with subsidies for photovoltaic systems and similar facilities.

Moreover, despite there being no legislation specifically targeting climate change at subnational level, the Austrian *Länder* have formulated state goals concerning climate protection and sustainability in their *Land* constitutions in the framework of their constitutional autonomy. This is the case for both Tyrol and Vorarlberg. Conversely, in Italy, only the Autonomous Province of Trento has introduced a specific piece of provincial legislation to frame its commitment to the fight against climate change. It follows that, from the point of view of legislative production, climate change, in its adaptation and mitigation dimensions, is currently primarily accounted for in sectoral legislation at the subnational level. Thus, in the analysed subnational entities there exists some room for improvement, as the two *Länder* Vorarlberg and Tyrol and the two Autonomous Provinces of Trento and Bolzano could make further use of their respective legislative initiative by introducing dedicated pieces of legislation (where these are lacking), or by explicitly declaring in sectoral laws that single measures, coupled with possibly binding mechanisms, be introduced for the purpose of combating climate change. The legal instruments for the implementation of climate protection and climate change adaptation are represented by the set of legal and administrative instruments available to each subnational entity on the basis of the above-illustrated division of (shared or exclusive) competences.

Beyond the legal framework, from the climate policy (development and implementation) point of view, subnational authorities may also play a significant role in the advancement of the climate change issue at subnational level, both from policy design and specialization perspectives, as they possess the necessary proximity, leadership and knowledge to enhance climate actions at the subnational and local level.

In all the subnational contexts analysed, the substantial adoption of policy tools that bind only the administrations has to be emphasised. They establish a political responsibility of the governments towards parliament, but no legal obligation. However, it should also be noted that these instruments were perceived as ultimately not being persuasive for the fulfilment of ambitious climate targets, nor for the achievement of the essential change in mindset in subnational communities. Indeed, the interviewees shared the perception that the tendential lack of binding measures for sectoral integration at both subnational or national level has a significant negative impact on the advancement of the fight against climate change.⁵⁷

From an Austrian perspective, the achievement of the goal, recently proclaimed by the Austrian federal government to reach climate neutrality by 2040, will require significant effort at all levels of government. Following the ratification of the Kyoto Protocol, the Paris Agreement and the introduction of binding targets at EU level, both *Land* Tyrol and Vorarlberg designed dedicated subnational climate policies and integrated climate change objectives into a number of sectoral policies in line with the respective framework policies. In both *Länder* and in all sectors, a proliferation of soft-law instruments, such as umbrella and sectoral policies, and other measures targeting behavioral change, especially via financial incentives and dissemination of information, can be observed.

From an Italian perspective, the two Autonomous Provinces followed different paths in addressing the challenges of climate change. While the Autonomous Province of Trento adopted a provincial law on the topic and created an Observatory on Climate Change, the Autonomous Province of Bolzano/Bozen did not enact a specific legal act or establish any specific institution. Despite the different approaches followed by the two to tackle climate change objectives, both Provinces developed their overall policy on climate change by identifying their general goals in soft law instruments, such as strategies, action plans and policy recommendations. All in all, the two Autonomous Provinces made progress in climate change adaptation and mitigation policies with a

57 IntT_01; IntT_02; IntV_04; IntV_06.

certain degree of autonomy from the state thanks to their constitutional status. In this regard, the provincial strategies appear to be in many respects even more advanced compared to national ones. Nonetheless, the role of the Italian State is still fundamental in adopting the guidelines and directives issued by Europe and implemented at subnational level, as well as in identifying the fundamental issues to be tailored to the provincial level.

Finally, in the context of our analysis, the role played by municipalities should not be disregarded either. In both countries, the latter enjoy a certain degree of autonomy, relying on their own statutes, powers and functions in compliance with the principles laid down in the respective Constitutions. Indeed, the municipal government is the level closest to the citizens and hence represents the last checkpoint for climate measures. This leads to coordination efforts between the upper subnational government and the municipal level for the implementation of subnational measures, or to the activation on their own initiative by municipalities within their own sphere of competences.

Concluding, it can be stated that the starting point for further analysis of the factors in the success or failings in climate change integration is indeed the specific legal and policy frameworks the analysed subnational entities have introduced at the subnational level, also in connection with the constitutional distribution of powers in the underlying federal and regional system, as described here. All in all, it can be further noted that since climate change is a cross-cutting competence matter, the vertical division of powers at constitutional level does not offer conclusive insights into the factual areas of intervention of subnational governments in the fight against climate change, but rather represents the frame of a painting, which is then completed based on the tool box (consisting of both legal and policy instruments) at the disposal of subnational authorities, and more importantly, on the basis of the operationalization of these instruments in practice.

PART 2

*Integrating Climate Change in the
Policy Sectors Where It Matters
Comparing Subnational Governments*



Transport

Alessio Claroni and Ekkehard Allinger-Csollich

Everybody should have the right to live his life without owning a car.¹



1 Introduction²

The transport sector has a strong impact on our society and all aspects of our lives. In this regard, the European Environment Agency (hereinafter EEA) notes that:

transport plays a vital role in society and the economy. Our quality of life depends on an efficient and accessible transport system. At the same time, transport is a key source of environmental pressures in the European Union (EU) and contributes to climate change, air pollution and noise. [...] Transport also continues to be a significant source of air pollution, especially in cities. Air pollutants, such as particulate matter (PM) and nitrogen dioxide (NO₂), harm human health and the environment. Although air pollution from transport has decreased in the last decade because of the introduction of fuel quality standards, the Euro vehicle emission standards and the use of cleaner technologies, air pollutant concentrations are still too high.³

1 K. Diehl, *Autokorrektur – Mobilität für eine lebenswerte Welt* (S. Fischer Verlag 2022).

2 In the joint elaboration of this Chapter, sections 2.1, 2.2, 2.3, 3.2, 3.2.1 and 3.2.2 were written by Alessio Claroni, sections 3.1, 3.1.1 and 3.1.2 by Ekkehard Allinger-Csollich, and sections 1 and 4 by both.

3 Source: <https://www.eea.europa.eu/themes/transport/intro>. All internet sources in this chapter were accessed on 16 June 2022.

These indications by the EEA are extremely interesting (and, in some ways, concerning). On the one hand, it is made clear that the development of human society depends on transport. In other words, a society without transport, or in which transport is limited, is under the current circumstances scarcely able to evolve, also in economic terms. On the other hand, the EEA clearly emphasizes that a connection exists between the transport sector and environmental pressures, also highlighting that the sector in question contributes to climate change and that air and noise pollution mainly affects urban settings.

In order to break the vicious circle between the transport sector and effects on the environment, while ensuring the development opportunities that the aforementioned sector offers, including at local level, the European Union (EU) – and, in turn, individual Member States – have intervened by implementing a transport decarbonization policy. In this regard, it must be said that, as was highlighted in the interviews, also at the subnational level “the stimulus provided by the European Union is described as being fundamental”.⁴

Given the importance of EU input and the corresponding relevance of the national implementation measures, in the following sections, we provide a partial overview of the recent European and national policies on decarbonization (from 2016 onwards) for the transport sector with specific reference to Austria and Italy.⁵ This overview is instrumental to illustrating to what extent the EU framework on transport and decarbonization is shaping subnational policies with regard to the context under consideration. Such EU influence, however, results in a significant emphasis on the concept of sustainable mobility, whereas climate change policy integration (CPI) concerns do not appear explicitly considered at the subnational level.

2 The European and National Decarbonisation Policy for the Transport Sector

2.1 *Low-Emission Mobility*

The overarching framework for decarbonization in the EU is provided by the European Commission’s communication titled “A European Strategy for Low-Emission Mobility” (COM(2016) 501 final).⁶ This indicated that today more

4 See N. Bertuzzi *et al.* (eds.), *Interview Report Bolzano, Trento, Vorarlberg and Tyrol* (2021), at 29.

5 On older European Union policy on sustainable transport, see, among others, D. Eißel and C. Peng Chu, “The Future of Sustainable Transport System for Europe”, *AI & Society*, 29 (2014) 387–402.

6 As indicated by K. Malnaca and I. Yatskiv, “Impact of Critical Variables on Economic Viability of Converted Diesel City Bus into Electric Bus”, in E.G. Nathanail and I.D. Karakikes (eds.),

than in the past, the transport sector can contribute to reducing emissions from the EU, in line both with the Paris Agreement on climate change⁷ and the 2030 Agenda on Sustainable Development.⁸ Given that more than 90% of transport energy needs in the EU are still met by oil, the European Commission highlights the need to speed up the transition to transport powered by low-emission alternative energy sources.

In this respect, action should be directed to both means of transport and infrastructure. Concerning the former, it is necessary to identify new forms of alternative renewable energies. If “[t]he widest range of options is currently available for passenger cars and buses”⁹ (including electro-mobility) and the electrification solution is best suited for railways, advanced biofuels and hydrogen, for example, it will be of particular importance in the medium term for air transport, trucks and buses. Furthermore (excluding the current war situation in Ukraine), an increasing use of natural gas (especially through power-to-gas technologies, which result in the use of bio-methane and synthetic methane) is expected as an alternative fuel for marine use in the maritime and river transport sector; similarly, it could represent an alternative to diesel fuel for trucks and buses.

With regard to infrastructures, the European Commission refers to Directive 2014/94/EU on the deployment of alternative fuels infrastructure (the so-called DAFI Directive).¹⁰ In summary, the objective of this directive is to minimize dependence on oil and mitigate environmental impact from the transport sector by identifying a common framework of measures aimed at creating alternative fuels infrastructure within the EU, such as recharging points for electric vehicles and refueling points for natural gas.¹¹

Data Analytics: Paving the Way to Sustainable Urban Mobility. Proceedings of 4th Conference on Sustainable Urban Mobility (CSUM2018), 24–25 May, Skiathos Island, Greece (Springer 2019) 847–855, at 847, “[t]hrough the Strategy, the European Commission is working to strengthen the economy by promoting sustainable urban mobility and increased use of clean and energy efficient vehicles, and looking into how to accelerate this process”.

7 Paris Agreement (Paris, 12 December 2015, in force 4 November 2016).

8 Transforming our World: the 2030 Agenda for Sustainable Development. UN res. A/RES/70/1 (21 October 2015).

9 See COM(2016) 501 final, Chapter 2.2 “Scaling Up the Use of Low-Emission Alternative Energy for Transport”.

10 As S. Furfari, “The Energy Dimension of Cities”, in M. Fernández-Prado and L. Domínguez Castro (eds.), *City Policies and the European Urban Agenda* (Palgrave Macmillan 2019) 195–223, at 212, pointed out, the “[...] 2014 Directive on the deployment of alternative fuels infrastructure—sometimes known as DAFI—is a milestone in the deployment of alternative solutions to the hegemony of oil products in the transport sector”.

11 The DAFI Directive was implemented in Italy with D.lgs. 257/2016, “*Disciplina di attuazione della direttiva 2014/94/UE del Parlamento europeo e del Consiglio, del 22 ottobre 2014,*

Another principle to which the 2016 communication refers is “moving towards zero-emission vehicles”, according to which the “[i]mproved efficiency of the transport system and shift to low-emission alternative energy need to be complemented by policies to support efficiency and innovation in vehicles and demand for such products”.¹² This principle will also need to apply to trucks and buses, and will have to involve not only vehicle manufacturers but also users.¹³

Among the cross-cutting initiatives and actions at all levels that the European Commission has identified in order to ensure the transition towards low-emission mobility, the one relating to “Investment” is highly relevant. In this context, in fact, the communication in question states that, in addition to the availability of various specific EU funds,¹⁴ “[...] EU investment instruments will be geared towards supporting higher efficiency of the transport system in a technology neutral way, low-emission alternative energy for transport and low- and zero-emissions vehicles”.

Considering the fact that an important cause of atmospheric pollution can be identified in urban transport,¹⁵ the “Action by cities” also deserves a specific mention. As indicated by the Commission, the implementation of this strategy depends above all on “cities and local authorities”. In particular, the Commission identifies solutions to the problem of urban pollution in the adoption of alternative mobility solutions to private vehicles and supporting

sulla realizzazione di una infrastruttura per i combustibili alternativi”. In Austria, the DAFI Directive implementation process followed an extensive participation process initiated, in 2015, by AustriaTech on behalf of the Ministry for Transport, Innovation and Technology (BMVIT). This process led to the adoption of the *Bundesgesetz zur Festlegung einheitlicher Standards beim Infrastrukturaufbau für alternative Kraftstoffe* (BGBl. I No. 38/2018; 12 July 2018). On the Austrian implementation process, see “Deployment of Alternative Fuels Infrastructure Implementing the EU Directive 2014/94/EU on the Alpine territory. An overview from the Working Group Transport of the Alpine Convention” (December 2018). Source: https://www.alpconv.org/fileadmin/user_upload/fotos/Banner/Topics/transport/AlpineConvention_TransportWG_AlternativeFuels_012019.pdf.

12 See COM(2016) 501 final, Chapter 2.3 “Moving towards Zero-Emission Vehicles”.

13 See COM(2016) 501 final, Chapter 2.3 “Moving towards Zero-Emission Vehicles”.

14 In fact, according to the communication, “[...] a number of specific EU funds are available. The transport-related envelope under the European Structural and Investment Funds totals EUR 70 billion, which includes EUR 39 billion for supporting the move towards low-emission mobility. This in turn includes EUR 12 billion for developing low-carbon, multi-modal sustainable urban mobility. The Connecting Europe Facility offers EUR 24 billion. A significant portion of Horizon 2020’s transport research and innovation programme amounting to EUR 6.4 billion is focused on low-carbon mobility”.

15 More precisely, COM(2016) 501 final, “[u]rban transport is responsible for 23% of EU’s greenhouse gas emissions”.

public transport and other sustainable modes of mobility (such as cycling, walking, and shared mobility).

2.2 *The Clean Vehicles Directive (CVD)*

The revised Clean Vehicles Directive (CVD) needs to be read within the context of two “Mobility Packages”,¹⁶ adopted by the European Commission respectively on 31 May and 8 November 2017 as part of the initiative “Europe on the Move”. More precisely, through the “Europe on the Move” initiative, the European Commission has proposed to modernize mobility and transport at European level, in terms of clean, competitive and connected mobility for all,¹⁷ with reference also to the issue of climate change.¹⁸

After the first Mobility Package, on 8 November 2017 the European Commission proposed specific measures to accelerate the transition to low- and zero-emission vehicles, which were contained in the so-called “Clean Mobility Package”. This Package was strongly oriented towards combating climate change, as evidenced by the words of the (then) President of the European Commission:

I want Europe to be the leader when it comes to the fight against climate change. The Commission wants to make our industry stronger and more competitive. I call on the car industry to come clean and make it right. Instead of looking for loopholes, they should be investing in the clean cars of the future. The Commission will shortly present proposals

16 On 17 May 2018, a third Mobility Package was presented in order “to ensure a smooth transition towards a mobility system which is safe, clean and connected & automated”. The third Mobility Package concludes the set of measures launched with the previous packages of May and November 2017, with which it forms “a single set of consistent policies addressing the many interlinked facets of our mobility system”. See https://ec.europa.eu/commission/presscorner/detail/en/IP_18_3708.

17 See Chapter 4 “Conclusions” of the 2017 communication from the European Commission on “Europe on the Move. An agenda for a socially fair transition towards clean, competitive and connected mobility for all” (COM(2017) 283 final).

18 See, in particular, Chapter 3.1 “Accelerating the shift to clean and sustainable mobility”, in which it is specified that “[a]lready today, many cities in Europe have decided to tackle the challenges posed by climate change, congestion and air pollution in a concerted manner”. That said, it is emphasized that “[t]hey are committed to investment in clean public transport and are also promoting active and sustainable modes of transport, supported by multimodal travel information services, which offer users a range of mobility options, including bicycle and car-sharing schemes”. Furthermore, “[s]ome cities are introducing or considering vehicle access restrictions in an effort to reduce the high levels of air pollution from road transport”.

to reduce the carbon emissions of our transport sector (President Jean-Claude Juncker, State of the Union Speech, 13 September 2017).¹⁹

This mobility package consists of numerous measures, one of which is particularly interesting to consider here. We are referring to the aforementioned CVD, or Directive 2009/33/EC on the promotion of clean road transport vehicles in support of low-emission mobility, as amended by the Directive (EU) 2019/1161, whose objective is to “[...] promote clean mobility solutions in public procurement tenders and thereby provide a solid basis to stimulate demand and the further deployment of clean mobility solutions”.²⁰

In its article 1, the CVD:

requires Member States to ensure that contracting authorities and contracting entities take into account lifetime energy and environmental impacts, including energy consumption and emissions of CO₂ and of certain pollutants, when procuring certain road transport vehicles with the objectives of promoting and stimulating the market for clean and energy-efficient vehicles and of improving the contribution of the transport sector to the environment, climate and energy policies of the Union.

In this context, the CVD aims to define minimum procurement targets for clean light-duty vehicles and clean heavy-duty vehicles, where these targets, to be achieved in two reference periods ending on 2025 and 2030, “are expressed as minimum percentages of clean vehicles in the total number of road transport vehicles covered by the aggregate of all contracts referred to in article 3 [...]”, including, in compliance with certain thresholds, “public service contracts within the meaning of Regulation (EC) No. 1370/2007²¹ [...] having as

19 See Preamble to the 2017 communication from the European Commission entitled “Delivering on low-emission mobility. A European Union that protects the planet, empowers its consumers and defends its industry and workers” (COM(2017) 675 final).

20 See the 2017 Communication from the European Commission entitled “Delivering on low-emission mobility. A European Union that protects the planet, empowers its consumers and defends its industry and workers” (COM(2017) 675 final).

21 It should be noted that Regulation (EC) 1370/2007, which concerns public passenger transport services by rail and by road, “[...] lays down the conditions under which competent authorities, when imposing or contracting for public service obligations (PSO), compensate public service operators for costs incurred and/or grant exclusive rights in return for the discharge of public service obligations”. (see article 1 of the Regulation (EC) 1370/2007). To be more precise, PSO means “a requirement defined or determined by a competent authority in order to ensure public passenger transport services in the general interest that an operator, if it were considering its own commercial interests, would not

their subject matter the provision of passenger road transport services [...]”²² (article 5 Directive 2009/33/EC, as amended).

With specific reference to Austria and Italy, the percentages of clean light-duty vehicles compared to the total number of light-duty vehicles covered by the contracts are 38.5% by 2025 and 2030 respectively. As for clean heavy-duty vehicles, again with reference to Austria and Italy, the percentages of these compared to the total number of heavy-duty vehicles covered by the contracts are 10% (trucks) and 45% (buses) by 2025; 15% (trucks) and 65% (buses) by 2030.

TABLE 1 Minimum procurement targets for the share of clean light-duty vehicles

	From 2 August 2021 to 31 December 2025		From 1 January 2026 to 31 December 2030	
Austria	38.5 %		38.5 %	
Italy	38.5 %		38.5 %	
	Trucks (vehicle category N ₂ and N ₃)		Buses (vehicle category M ₃)	
	From 2 August 2021 to 31 December 2025	From 1 January 2026 to 31 December 2030	From 2 August 2021 to 31 December 2025	From 1 January 2026 to 31 December 2030
Austria	10 %	15 %	45 %	65 %
Italy	10 %	15 %	45 %	65 %

DIRECTIVE 2009/33/EC, AS AMENDED BY THE DIRECTIVE (EU) 2019/1161 (FROM TABLES 3 AND 4 OF THE ANNEX; SOURCE: [HTTPS://EUR-LEX.EUROPA.EU/LEGAL-CONTENT/EN/TXT/HTML/?URI=CELEX:02009L0033-20190801&FROM=EN](https://eur-lex.europa.eu/legal-content/en/txt/html/?uri=CELEX:02009L0033-20190801&from=en))

Another important aspect of the CVD is the notion of “clean vehicle”. The CVD (and, specifically, article 4 Directive 2009/33/EC, as amended) introduces a definition of “clean vehicle”, which considers the requirements for the reduction of greenhouse gas emissions and air pollutants by light-duty vehicles. Also

assume or would not assume to the same extent or under the same conditions without reward” (see article 2(e) of Regulation (EC) 1370/2007). From an environmental point of view, it is interesting to note that Recital 17 of the Regulation in question states that “[...] competent authorities are free to establish social and qualitative criteria in order to maintain and raise quality standards for public service obligations, for instance with regard to [...] environmental protection [...]”.

22 Among the contracts considered by article 3 of Directive 2009/33/EC, as amended, reference is also made, for example, to “contracts for the purchase, lease, rent or hire-purchase of road transport vehicles [...]”.

interesting is the definition of clean heavy-duty vehicles (i.e. vehicles of category M₃, N₂ or N₃), defined as such if they use alternative fuels, according to the aforementioned Directive 2014/94/EU.²³ Still in relation to heavy-duty vehicles, the CVD also identifies the definition of “zero-emission heavy duty vehicle”, that is a clean vehicle “without an internal combustion engine, or with an internal combustion engine that emits less than 1 g CO₂/kWh [...]”.²⁴

As regards national law, it should be noted that Italy has implemented the directive (EU) 2019/1161 with D.lgs. 187/2021. Regarding Austria, the Directive is implemented in national law by the “*Straßenverkehr-Beschaffungsgesetz*” (BGBl. I No. 163/2021) of 27 July 2021. In addition, “Austria’s 2030 Mobility Master Plan” has to be considered, which “identifies ways to avoid, shift and improve traffic and transport and significantly increase the share of eco-mobility in total transport – foot and bicycle traffic, public modes of transport, and shared mobility”.²⁵ Within that context, with specific reference to the CVD applied to the public transport sector, it is specified that:

in addition to greatly expanding public transport, we also need to make sure that existing and new public road transport is zero-emission. The specifications of the Clean Vehicles Directive (CVD) provide support by setting ambitious targets for procuring clean vehicles between now and 2030. To meet Paris climate targets and achieve climate-neutrality by 2040 new registrations of buses must be limited to zero-emission buses (class M₂ and M₃) by 2032. In addition to battery electric buses, hydrogen fuel cell buses will be used so that lines that are difficult to electrify can also be operated with zero emissions. Funding mechanisms to reduce the added cost of electrifying bus fleets and a gradual phase-out of diesel will be needed in order to implement the Clean Vehicles Directive. Electric road systems, batteries and hydrogen will make public transport’s dependence on fossil fuels – on the road and on the rails – a thing of the past.²⁶

2.3 *Clean Mobility, with a Special Focus on Urban and Rural Areas*

In order to prevent the risks associated with climate change through outlining a transition towards zero GHG emissions by 2050, the 2018 European Commission’s communication entitled “A Clean Planet for all – A European strategic long-term vision for a prosperous, modern, competitive and climate

²³ See article 4, No. 4 (b) Directive 2009/33/EC, as amended.

²⁴ *De facto* 4 Directive 2009/33/EC, as amended.

²⁵ See <https://www.bmk.gv.at/en/topics/mobility/mobilitymasterplan2030.html>.

²⁶ *Ibid.*

neutral economy" (COM(2018) 773 final) identifies a joint action, divided into seven strategic components, the third of which concerns mobility. According to this third component entitled "Embrace clean, safe and connected mobility", all transport modes must contribute to the decarbonization of the mobility system, with a prevalence of rail transport over road transport, which is more polluting.

This system-based approach requires that low and zero emission vehicles with highly efficient alternative powertrains are used for all modes of transport. However, the communication points out that since the solution of using renewables alone for electrification is not immediately applicable to all means of transport, it is necessary to identify alternative solutions, such as alternative fuels and hydrogen-based technologies.²⁷ For instance, in relation to long-distance haulage, in the short-term, a solution can be represented by the use of liquefied natural gas with high blends of bio-methane.

In a similar way to the 2016 communication analyzed above, the Commission reiterates that clean mobility also requires deep commitment in urban areas, as these (together with smart cities) are set to become "the first centres of innovation in mobility"²⁸ with a view to achieving sustainable and safe mobility. Furthermore, transition towards net-zero in 2050 also depends on infrastructure, which must be improved to adapt to the use of less polluting means of transport.

In 2019, the communication from the European Commission on "The European Green Deal" (COM(2019) 640 final)²⁹ reiterated the commitment, already included in the aforementioned communication of 2018, to achieve climate neutrality by 2050,³⁰ and provided for the adoption in 2020 of a specific strategy for sustainable and smart mobility. The European Commission's 2020 communication on a "Sustainable and Smart Mobility Strategy – putting European transport on track for the future" (COM(2020) 789 final) clearly

²⁷ The Commission takes the example of "electric vehicles and vessels based on fuel cells".

²⁸ See Chapter 3 "Pathways for the Transition to a Net-Zero Greenhouse Gas Emissions Economy and Strategic Priorities", *sub* action No. 3.

²⁹ On the relationship between the Communications from the European Commission "A Clean Planet for all [...]" and "The European Green Deal", see F. Rolando, "L'attuazione del Green Deal e del Dispositivo per la ripresa e resilienza: siamo effettivamente sulla strada per raggiungere la sostenibilità ambientale?", *Osservatorio europeo Diritto dell'Unione Europea*, (2022) 1–19, at 4.

³⁰ Also assuming a reduction in EU's greenhouse gas emissions by 2030 of at least 50–55% compared to 1990 levels, later confirmed ("at least 55%") in the communication from the European Commission entitled "Stepping up Europe's 2030 climate ambition. Investing in a climate-neutral future for the benefit of our people" (COM(2020) 562 final).

highlights that “[...] the most serious challenge facing the transport sector is to significantly reduce its emissions and become more sustainable”.³¹ In this regard, the strategy, in highlighting that “[g]reening mobility must be the new licence for the transport sector to grow”,³² defines ten flagship areas, where mobility must lead to a fully sustainable future.³³ In relation to interurban and urban mobility, Flagship 3 (entitled “Making interurban and urban mobility more sustainable and healthy”) underlines the need for a truly multimodal system with regard to sustainable and smart mobility services. In this system, rail transport needs to be further enhanced, including through the development of high-speed rail services on short-haul distances.

Furthermore, according to the Commission, seamless multimodality is key in urban and suburban areas, and can develop thanks to digital solutions. An emerging digital solution that may encourage multimodality can be seen in the integration of different transport services into a service accessible on request, according to the so-called Mobility as a Service (MaaS) model, as “digitally connected transport services provided by companies, public institutions or individuals to paying customers which can make owning a private car obsolete”.³⁴

Equally important in limiting the number of private vehicles on the roads are “shared and collaborative mobility services (shared cars, bikes, ride-hailing, and other forms of micromobility)”, which have developed thanks to digital platforms.³⁵ Furthermore, from a functional point of view, the 2021

31 On the concept of sustainable mobility see, among others, S. Maggi, *Mobilità sostenibile. Muoversi nel XXI secolo* (Il Mulino 2020); also for the cited bibliography see A. Claroni, “Il mobility manager quale figura di impulso nella ricerca di una mobilità pienamente sostenibile”, *Il Diritto Marittimo*, 111 (2021) 463–483, at 464 footnote 4.

32 See Chapter 1 “Our vision”, *sub point No. 6*.

33 According to the communication, “it is crucial that mobility is available and affordable for all, that rural and remote regions are better connected, accessible for persons with reduced mobility and persons with disabilities, and that the sector offers good social conditions, reskilling opportunities, and provides attractive jobs”.

34 M. Neef, T. Dettmber and L. Schebek, “Comparing Carbon Performances of Mobility Services and Private Vehicles from a Life Cycle Perspective”, in F. Teuteberg, M. Hempel and L. Schebek (eds.), *Progress in Life Cycle Assessment 2018* (Springer 2019) 47–60, at 49. Regarding the problems that could arise from mismanagement of the information collected through the MaaS platform, see M. Themou, F. Mikiki and M. Markou, “Mobility as a Service: Implications for Spatial and Social Cohesion”, in E.G. Nathanail and I.D. Karakikes (eds.), *Advances in Mobility-as-a-Service Systems. Proceedings of 5th Conference on Sustainable Urban Mobility, Virtual CSUM2020, June 17–19, 2020, Greece* (Springer 2021) 626–632, at 630.

35 There is extensive literature on the topic of shared mobility. Among others, see G. Smorto and I. Vinci (eds.), *The Role of Sharing Mobility in Contemporary Cities. Legal, Social and Environmental Issues* (UNIPA Springer Series 2020).

communication from the European Commission on “The New EU Urban Mobility Framework” (COM(2021) 811 final) indicates that micro-mobility services can be particularly useful “[...] in order to cover the last mile where access points are far or frequency of public transport is low”.³⁶

It must be said that the same 2021 communication also refers to rural areas (which include most parts of the Alpine Space), specifying that “[p]ublic transport planning should also address connections with the areas outside the city centre, including connections to the suburbs and rural areas beyond the city”. More broadly, the European Commission has dedicated its 2021 communication on “A long-term Vision for the EU’s Rural Areas – Towards stronger, connected, resilient and prosperous rural areas by 2040” (COM(2021) 345 final) to rural areas; the topic is also highly relevant to the issue of climate change because, as specified in this communication, “[r]ural areas are active players in the EU’s green and digital transitions. Through sustainable production of food, preservation of biodiversity and the fight against climate change, they play a key role in achieving the European Union’s Green Deal [...]”. In this context, it is specified that, in order for rural areas to develop further, they must be well connected to each other and to urban and peri-urban areas.³⁷ Finally, in order to improve connections with rural areas, the last communication cited points out that it is necessary to resort to digitalization, as this will be able to guarantee sustainable and innovative multimodal mobility solutions.

3 Regional Regulation and Strategies to Change the Transport System

3.1 *Austria*

According to the Austrian Constitution³⁸ most transport related matters are the legal responsibility of the *Bund*, but have to be administered at regional (*Länder*) level, either in indirect federal administration or in autonomous *Land* administration. The following examples will show this constitutional cooperation between federal and regional levels.

a) *StVO – Straßenverkehrsordnung*³⁹ (Road traffic regulations)

Traffic laws enacted by the *Bund* represent a very important instrument to shift traffic from motorized vehicles to active and sustainable forms of mobility.

36 See point 30.

37 See Chapter 2.2 “Connected rural areas”.

38 B-VG, *Bundesverfassungsgesetz*, articles 10–14.

39 *StVO- Straßenverkehrsordnung, Straßenverkehrsordnung 1960*, current version BGBl I, No. 154/2021.

Regulations to minimize the discrimination of pedestrians and bicycles with regard to cars and trucks have a direct influence on the attractiveness of these sustainable transport modes. For example, rules for shared space,⁴⁰ priority and speed limits enable regions and communities to prioritize walking and cycling by creating specific lanes on the road in order to make these modes safer and faster.

b) *ÖPNRV-G*⁴¹ – Law on planning and financing public means of transport
This federal law establishes the responsibility for and the planning and financing of public transport in Austria with the aim of strengthening and optimizing rail and bus services (especially at regional level). The Ministry for Climate Action, Environment, Energy, Mobility, Innovation and Technology (BMK) has to cooperate with the *Länder* in financing regional public services; the *Länder* themselves are responsible for the optimization and planning of timetables, tendering of services and customer relations. The *Verkehrsverbundorganisationen* (*Verkehrsverbände* – transport networks) are responsible for the organization of public transport services.

Many other legal frameworks (e.g. financial rules, rules for train services, combined goods transportation, technical rules for motorized traffic⁴² etc.) form the basis for the Austrian current transport system. This patchwork of measures, however, is insufficient to achieve a decarbonized and sustainable transport system in line with EU requirements. In this respect, what would be necessary, as indicated in the “*Mobilitätsmasterplan 2030*”, is “a sensible combination of avoiding traffic, shifting traffic and improving the efficiency of each mode of transport ... backed by a marked increase in the energy-efficiency of the entire transport system within the available carbon budget.”⁴³

40 Shared Space refers to a planning concept according to which public road space, which is dominated by motor vehicle traffic, is to be made more livable, safer and the flow of traffic improved. The idea of doing without traffic signs, signal systems and road markings is characteristic. At the same time, road users should be given equal rights, with the right of way rule continuing to apply. In contrast to conventional traffic calming, it should also be possible to use this on main roads.

41 *ÖPNRV-G, Öffentlicher Personennah- und –Regionalsverkehrs-Gesetz* 1999, current version BGBl. I, No. 59/2015.

42 E.g. FVG, *Finanzverfassungsgesetz*; current version available at https://www.ris.bka.gv.at/Dokumente/BgblPdf/2003_100_1/2003_100_1.pdf; EisBG; *Eisenbahngesetz*; current version BGBl. I No. 231/2021; KFG; *Kraftfahrwesen-Gesetz*; current version BGBl. I No. 48/2021; KfllG; *Kraftfahrlineingesetz*; current version BGBl. I No. 61/2015.

43 *Mobilitätsmasterplan 2030 – Weg zur Klimaneutralität 2040*, Vienna 2021; Ministry for Climate Protection, Environment, Energy, Mobility, Innovation and Technology; Publication of counterproductive subsidies, *bmkg.gv.at (Veröffentlichung kontraproduktiver Anreize und Förderungen)*, Vienna 2021; published by the Ministry for Climate Protection, Environment, Energy, Mobility, Innovation and Technology.

The “*Mobilitätsmasterplan 2030*” addresses the “*Zielbild 2040*” (target 2040) and describes all necessary measures to enable Austria to finally reach the necessary climate targets in the year 2040. The *Mobilitätsmasterplan* is backed by a marked increase in the energy efficiency of the entire transport system within the available carbon budget. It states however that even with 100% percent electrified car-mobility, it is still necessary to reduce road traffic by approximately one quarter by 2040.⁴⁴

3.1.1 Tyrol

Tyrol reports its developments in mobility and traffic to the Tyrolean parliament in the yearly “*Verkehrsbericht*” (Traffic report),⁴⁵ which informs the public in a transparent way on changes to the mobility and traffic system. From this report it emerges that the new strategy of sustainable development in Tyrol with many measures in the field of mobility is currently in progress.⁴⁶ The measures that make up this strategy were published in April 2022.⁴⁷ Over the next three years, the main topics to be addressed include active mobility, public transport, new infrastructure, future oriented goods-traffic, sharing models and new fields of mobility and transport policies.

In the transport sector, *Land* Tyrol has been working since 2005 on subsidies for sustainable forms of traffic. Since 2008, the mobility program of the Tyrolean government has subsidized Tyrolean citizens to encourage walking, cycling and public means of transport.⁴⁸ The subsidies run from planning to investment in these modes.⁴⁹ In 2016 an initial cycling strategy was implemented with the main focus on building and refurbishing the cycling infrastructure on the most important regional connections in Tyrol. This strategy will be extended and renewed in 2022 according to the above-mentioned

44 *Mobilitätsplan 2030*, at 27.

45 *Verkehrsbericht Tirol*, yearly report on mobility and transport in Tyrol – latest version 2020; www.tirol.gv.at/Verkehr/publikationen.

46 *Tiroler Nachhaltigkeits- und Klimastrategie – Leben mit Zukunft*; www.tirol.gv.at.

47 *Leben mit Zukunft – Tiroler Nachhaltigkeits- und Klimastrategie – Maßnahmenprogramm 2022–2024*; https://www.tirol.gv.at/fileadmin/presse/Tiroler_Ma%C3%A4nahmenprogramm_zur_Nachhaltigkeits_und_Klimastrategie_.pdf.

48 *Mobilitätsprogramm 2008 – 2013; Mobilitätprogramm 2013 – 2020* incl. extension to 2021; *Mobilitätsprogramm 2022 – 2030*; Tyrolean government; www.tirol.gv.at/verkehr/mobilitaetsplanung/mobilitaetsprogramm.

49 Please refer to rules for subsidies in building cycle routes, car-sharing, mobility concepts, transport, bicycles at www.tirol.gv.at.

“Maßnahmenprogramm 2022–2024” with the goal to establish Tyrol as a cycling region for citizens and tourism.⁵⁰

Public forms of transport, rail and bus services, have also been extended in recent years. In particular the tariff system has been changed and now offers travel throughout the region for a flat rate. Since 2016 the region-wide flat rate annual seasonal ticket “*Klimaticket Tirol*” has enabled all Tyrol’s citizens to use public transport for a very affordable price. There are also concessions available (eg for senior citizens over 65 years and young people under 26 years of age).⁵¹

Furthermore, since 2008 Tyrol has made an effort to strengthen its major public transport infrastructures by implementing the following initiatives:

- (a) the *S-Bahn* rapid regional rail concept, which has led to the creation of new railway stations and the refurbishment of existing ones in the central region of Tyrol;⁵²
- (b) the construction of the new regional tramway from Rum to Völs;⁵³
- (c) the new “*Tirol-Vertrag II*” contract between *Land Tyrol* and the *ÖBB* federal railways concerning barrier-free access to all major stations in Tyrol and the strategic development of new rail infrastructure in Tyrol (two-track extension in the Tyrolean “*Oberland*”, *Fernpassbahn*, *Taerra raetica*, ...).

With regard to goods transportation, the most important change is the building of the Brenner Base Tunnel and the new railway line through the Lower Inn Valley to shift transport from road to rail. The TEN-T Corridor of the European Union, which will run from the Northern European countries down to Malta, and especially its most important section between Munich and Verona, should enable the EU to reach its goals in transitioning from road to rail on long distance services.⁵⁴

Although the above-mentioned initiatives have been adopted in Tyrol, individual motor driven road traffic is still predominant. A clearer step towards alternative modes of transportation was taken in September 2021, when the

50 www.tirol.gv.at/meldungen/meldung/landesregierung-beschliesst-massnahmenprogramm-zur-tiroler-nachhaltigkeits-und-klimastrategie/.

51 All prices at www.vvt.at.

52 Newly built stations: Hall/Thaur (2017), Messe (2021), Wifi-Innrain (planned 2024).

53 In 2019 the tram service entered operation within the boundaries of Innsbruck, in January 2023 the section to Rum will follow and by the end of 2026 the tram service will continue from the western end as far as Völs Station.

54 See https://transport.ec.europa.eu/transport-themes/infrastructure-and-investment/trans-european-transport-network-ten-t_en.

regional government for the first time prioritized active mobility (walking and cycling) for short distances in the “*Leitantrag – Land und Klima schützen*”.⁵⁵

3.1.2 Vorarlberg

Since Vorarlberg – as a *Land* of Austria – has the same constitutional status as Tyrol, national and EU-rules dictate matters and influence the administration in a very similar way. Nevertheless, there are some differences in the way the region is administered and its responsibilities. The involvement of stakeholders and the population has a long tradition in Vorarlberg. The founding of “*Bürgerräte*” and civil participation in nearly all high profile projects helps to establish a wide basis for acceptance at the level of politics, the economy and the population.⁵⁶

Within this context, Vorarlberg has adopted a Mobility Concept.⁵⁷ The Mobility Concept Vorarlberg 2019 formulates principles for Vorarlberg’s future transport policy, on which goals and priorities are based. The goals primarily serve to examine the effects of the main issues and ongoing activities. For example, objectives regarding the choice of mode of transport aimed at increasing the proportion of journeys on public transport and bicycle were anchored in the draft assessment. This strategy is continuously amended and detailed by sub-strategies on cycling and e-mobility.⁵⁸ Having adopted such detailed strategic documents, Vorarlberg is highly advanced in comparison to other *Länder* in Austria. Nevertheless, individual road traffic will still continue to play an important role in practice, as demonstrated by the extensive new road infrastructures planned in the regions of Bregenz and Feldkirch.

Public transport in Vorarlberg is organized by the vvv (“*Vorarlberger Verkehrsverbund*”) in cooperation with the office of the *Land*. Since 2009 has Vorarlberg improved regional mobility by creating rail connections through the Kloster and the Rhine valleys from Feldkirch to Bregenz. Within the new contract period (2019 – 2028), this offer could be expanded, especially through

55 *Leitantrag – Land und Klima schützen* (tirol.gv.at); https://www.tirol.gv.at/fileadmin/presse/bilder/Platter/Regierungsklausur_2021/Leitantrag__Land_und_Klima_schoOten.pdf.

56 About the installation of *Bürgerräte* (citizens’ assemblies): <https://vorarlberg.at/-/buergerraete-in-vorarlberg>. See Chapter 9 in this volume.

57 E.g. Mobility Concept (strategy 2006–2019); <https://vorarlberg.at/-/mobilitaetskonzept-vorarlberg-2019>.

58 E.g. Cycling Strategy; <https://vorarlberg.at/-/ketten-reaktion-vorarlbergs-radverkehrsstrategie>; E-Mobility-Strategy; <https://www.klimafonds.gv.at/wp-content/uploads/sites/16/E-Mob-Strategie-Vorarlberg-1.pdf>.

the introduction of new rolling stock (railway wagons), which will be delivered in 2023.

At the moment a concept for freight transport is in progress⁵⁹ and is expected to be completed in the second quarter of 2022. Target issues will be the construction of new terminals, new logistic concepts for regional and urban transport and the decarbonization of freight transport itself.

Vorarlberg's mobility concept also includes the implementation of the cycle traffic strategy "*Kettenreaktion*". Vorarlberg has a long tradition of the government itself taking responsibility for its regional cycle routes and infrastructure. Municipalities are given financial incentives and provided with workforce to build new cycle routes. This is reflected in cycling representing a high share of overall mobility. Like in Switzerland, bicycles (often in combination with public transport) constitute an important part of the mobility system and are accepted by all levels of society (politics, the economy and citizens).

3.2 Italy

Italy is committed to developing a transport system that is sustainable in all its different modalities.

With regard to local public transport,⁶⁰ it is interesting to mention D.L. 59/2021 concerning "*Misure urgenti relative al Fondo complementare al Piano nazionale di ripresa e resilienza e altre misure urgenti per gli investimenti*", which is of particular interest in the context of this research, and an example that reflects the recent regulatory framework. In particular, it allocates considerable resources for the renewal of vehicles destined for local public transport.⁶¹ This is in order "to accelerate the renewal of the bus fleet with vehicles powered by LNG⁶² and CNG,⁶³ therefore by methane, destined for suburban and interurban transport".⁶⁴

59 Güterverkehrskonzept; <https://vorarlberg.at/-/gueterverkehrskonzept-vorarlberg>.

60 On the subject of local public transport, without claiming to be exhaustive, D.lgs. 422/1997, *Conferimento alle regioni ed agli enti locali di funzioni e compiti in materia di trasporto pubblico locale, a norma dell'articolo 4, comma 4, della legge 15 marzo 1997, n. 59* should also be mentioned. See, in particular, articles 14 and 18(3-quarter)(b), on the environmental sustainability profile.

61 Article 1, paragraph 2(c) of the D.L. in question, in fact, allocates, for buses: 62.12 million euros for 2022, 80.74 million euros for 2023, 159.01 million euros for 2024, 173.91 million euros for 2025 and € 124.22 million for 2026.

62 Liquefied Natural Gas.

63 Compressed Natural Gas.

64 Source (in Italian): <https://temi.camera.it/leg18/temi/l-innovazione-nel-trasporto-stradale-e-la-mobilit-sostenibile.html>.

In addition to this, L. 232/2016⁶⁵ provided for the preparation of a “*Piano Strategico Nazionale della Mobilità Sostenibile*” (“National Strategic Plan for Sustainable Mobility”), approved through the D.P.C.M. 30 April 2019.⁶⁶ In particular, as specified by article 1, paragraph 613, the National Strategic Plan is aimed at the renewal of bus fleets of local and regional public transport services and the promotion and improvement of air quality through innovative technologies, in line with international agreements as well as with guidelines and EU legislation.

Alongside the National Strategic Plan, the aforementioned article 1, paragraph 613, provided additional financial resources to a fund for the improvement of means for local public transport⁶⁷ with specific resources for sustainable mobility, so as to implement the National Strategic Plan in question. Specifically, this fund was increased by 200 million euros for the year 2019 and by 250 million euros for each of the years from 2020 to 2033.

As well as initiatives concerning sustainable urban mobility, Italy is also committed to promoting electric micro-mobility. Without claiming to be exhaustive, on electric micro-mobility, article 1, paragraph 102 of L. 145/2018⁶⁸ authorized the experimentation of road circulation of personal mobility vehicles using mainly electric propulsion, such as Segways, hoverboards and scooters. In this regard, the Decree of the Ministry of Infrastructures and Transport (today, Ministry of Sustainable Infrastructures and Mobility) of 4 June 2019 defined the implementation methods and operational instruments of the aforementioned experimentation. Equally interesting on the subject of micro-mobility is D.L. 162/2019,⁶⁹ which regulates the circulation of electric scooters, also with regard to sanctions.

3.2.1 Autonomous Province of Bolzano

Various initiatives have been taken into consideration by the Autonomous Province of Bolzano as a means of developing an environmentally friendly

65 L. 232/2016, *Bilancio di previsione dello Stato per l'anno finanziario 2017 e bilancio pluriennale per il triennio 2017–2019*.

66 Source: https://www.mit.gov.it/sites/default/files/media/normativa/2019-06/DPCM_PS_NMS.pdf.

67 Referred to in article 1, paragraph 866, of L. 208/2015, *Disposizioni per la formazione del bilancio annuale e pluriennale dello Stato (legge di stabilità 2016)*.

68 L. 145/2018, *Bilancio di previsione dello Stato per l'anno finanziario 2019 e bilancio pluriennale per il triennio 2019–2021*.

69 D.L. 162/2019, *Disposizioni urgenti in materia di proroga di termini legislativi, di organizzazione delle pubbliche amministrazioni, nonché di innovazione tecnologica*. See, in particular, article 33bis.

transport system. Through “Green Mobility South Tyrol”, for example, the Autonomous Province of Bolzano, with the coordination of *STA – Struttura Trasporto Alto Adige SpA*, has set itself the ambitious goal of transforming South Tyrol into a model region for sustainable Alpine mobility. Specifically, “Focusing on connecting and expanding many different forms of sustainable transport (walking, cycling, public transport), the “Green Region” South Tyrol is re-thinking mobility and transport – by working towards solutions that are emission-free and harmless to the environment and its people. Electric mobility especially is an integral part of the approach to a smart and sustainable alpine mobility”.⁷⁰ From the latter point of view, it is significant to highlight the fact that the Autonomous Province of Bolzano is the leader “in Italy for what concerns the proportion of residents/cars charging stations”.⁷¹

An additional significant initiative is represented by the “*Südtirol Pass*”: a personalized annual electronic season ticket that can be used on all means of public transport throughout South Tyrol. In this sense, this initiative intends to increase the use of alternative modes to private transport, through an “integrated response to the necessity of moving around the province”.⁷² To facilitate the use of public transport, the “*Südtirol Pass*” is based on the following formula: the more kilometers one covers in a year, the cheaper each new journey becomes. Another interesting initiative is represented by “*Alto Adige Pedala*”, which encourages the use of bicycles by entering those who travel a certain number of kilometers into a prize draw.⁷³

As far as rail transport is concerned, it should be noted that in 2005 the Val Venosta Railway, which connects Merano and Malles, was reopened.⁷⁴ As specified in the interview report (at 7), the initiative assumes particular importance as it has given rise to similar projects at the provincial level, by “creating alternatives to the use of cars”, thus contributing to the reduction of environmental pollution.⁷⁵

From a legislative point of view, in terms of eco-sustainable mobility, it is also interesting to mention article 51(5)(f) L.P. 9/2018, *Territorio e paesaggio*,

70 Source: <https://www.greenmobility.bz.it/en/>.

71 IntBZ_05.

72 IntBZ_09.

73 A similar initiative is that of the “Bike cream challenge”, which offers, in the summer, an ice cream for those who frequently use a bicycle. For more information on this initiative, see <https://news.provincia.bz.it/it/news/bike-cream-challenge-si-pedala-per-una-settimana>.

74 On the subject, see <https://www.provincia.bz.it/turismo-mobilita/mobilita/ferrovia-della-val-venosta.asp>.

75 N. Bertuzzi *et al.* (eds.), *Interview Report, supra*, at 7.

which provides that municipalities must prepare a municipal development program, which must include a mobility and accessibility program aimed at limiting motorized traffic and favoring cycle and pedestrian mobility. The “Save the Air – *Insieme per un’aria migliore*” initiative must also be highlighted. This information campaign aims to raise awareness among citizens on the importance of protecting the air as a common good.⁷⁶ The information campaign also encourages the use of public transport, such as trains and buses. With regard to buses, it is interesting to highlight the use of hydrogen buses, which are increasingly environmentally friendly.⁷⁷ Furthermore, the L.P. Bolzano 15/2015, *Mobilità pubblica*, encourages sustainable and eco-friendly transport of people and intermodal mobility.⁷⁸

In terms of sustainability, especially with regard to the transport of goods, the Brenner Base Tunnel (BBT), which provides for connection “for 55 km between Innsbruck (in Austria) and Fortezza (in Italy)”, should also be mentioned: in this regard, in fact, it is pointed out that “[t]he BBT is meant primarily for freight transport, allowing a modal shift of traffic from road to rail. Passenger trains can also travel through the tunnel”.⁷⁹

3.2.2 Autonomous Province of Trento

The Autonomous Province of Trento aims to reduce the climate impact of the transport sector in the coming years⁸⁰ through L.P. 6/2017, “*Pianificazione e gestione degli interventi in materia di mobilità sostenibile*”. This provincial law imposes, among other things, principles aimed at protecting the social and public right of citizens to mobility throughout the provincial territory. In terms of content, this law represents a sort of exception, as it aims to identify objectives that are normally found in non-normative documents.⁸¹ In this perspective, the Provincial Mobility Plan (referred to in article 2) promotes numerous solutions – including innovative ones, such as “the coordinated management of the various transport systems, both for people and goods, promoting integrated mobility systems also through the use of drones” (article 2(3)(a), in Italian) – aimed at achieving sustainable mobility. The integration of local public transport with other forms of sustainable mobility, including shared mobility, is also important (article 2(4)(a)). Verification of the implementation of the

76 Source: <https://ambiente.provincia.bz.it/aria/missione-aria-pulita.asp#save-the-air>.

77 Source: <https://news.provincia.bz.it/it/news-archive/655761>.

78 See, in particular, article 30.

79 Source: <https://www.bbt-se.com/en/tunnel/european-dimension/>.

80 See N. Bertuzzi et al. (eds.), *Interview Report, supra*, at 29.

81 *Ibid.*, at 28.

Provincial Mobility Plan is the responsibility of the Provincial Observatory on Sustainable Mobility, established pursuant to article 10 of the provincial law in question.

A crucial aspect of L.P. 6/2017 concerned popular participation in the actual drawing up of the provincial law. Indeed, article 1(4) of the same law establishes that “The Province promotes popular participation in choices about mobility, in a perspective of shared responsibility”. This is to be considered a positive development since, if everyone participates in the process of defining the rules to be applied in terms of sustainable mobility, those new behavioral rules will probably be better accepted (and applied) by citizens.

In addition to the aforementioned Provincial Mobility Plan, another interesting plan regarding the relationship between the environment and the transport sector is the Provincial Plan for the Protection of Air Quality 2018⁸² (hereinafter, the Air Quality Provincial Plan).⁸³ The Air Quality Provincial Plan, in particular, allows the Autonomous Province of Trento to plan how to act on the main sources of emissions affecting the quality of ambient air (Chapter 1 – Objectives of the Plan). Interestingly, in Chapter 6.4 concerning the “Transport sector and sustainable mobility” (“*Settore trasporti e mobilità sostenibile*”), it highlights that road transport is one of the most significant sources of emissions in the Province of Trento. As such, the Air Quality Provincial Plan recognizes the importance of increasing the electric traction of vehicles. In this regard, it should be noted that in 2017 the Province of Trento adopted the Provincial Plan for Electric Mobility (“*Piano Provinciale per la Mobilità Elettrica*” – PPME⁸⁴). It should also be specified that this Plan was reviewed by the PEAP (*Piano Energetico Ambientale Provinciale 2021–2030*), focusing on the achievement of three specific objectives: increase in electric bicycles (e-bikes); increase in electric traction vehicles; increase in charging infrastructure.⁸⁵

Returning to the Air Quality Provincial Plan, in terms of sustainable mobility, this promotes the complete implementation of the aforementioned L.P. 6/2017, leading to a constant increase in the use of local public road and rail transport. As for rail transport, the interviews highlighted the peculiarities of the PAT territory, which is largely mountainous and which, consequently,

82 Source: http://www.appa.provincia.tn.it/pianificazione/Piano_tutela_aria/-Pianotutela_aria_2018/.

83 IntTN_07.

84 Source: <https://www.ufficiostampa.provincia.tn.it/Comunicati/Il-Piano-provinciale-per-la-mobilita-elettrica-diventa-realta>.

85 See, in particular, PEAP 2021–2030 (source: https://drive.google.com/file/d/1hFUtV26-DI6uWR7-b6ZHHBOHEInI_pIQ/view), 159.

makes rail transport less efficient than road transport. Despite this, rail transport must not be abandoned, instead it is necessary to carefully plan where to construct new lines. Furthermore, rail transport involves large investments and, therefore, requires significant public funding.⁸⁶ However, there are also virtuous examples of significant improvements made with few resources, as in the case of the Valsugana and Trento-Malè lines.⁸⁷

The Air Quality Provincial Plan also promotes the use of bicycles, favoring modal interchange with local public transport.⁸⁸ It is interesting to note that, with reference to the use of bicycles, from an infrastructural point of view, Trentino is at the forefront as regards the development of cycle routes and cycle tourism.⁸⁹

Still on the subject of sustainable mobility, the project to quadruple the Brenner railway is extremely important. This aims to optimize the use of the high-capacity line guaranteed by the new Brenner Base Tunnel, and directly affects the province of Trento.⁹⁰ It is also important to mention the LIFE BrennerLEC Project.⁹¹ The Project is coordinated by *Autostrada del Brennero S.p.A.* in collaboration with the Provincial Agency for Environmental Protection of Trento, the Environmental Agency of Bolzano, the University of Trento and local companies CISMA and IDM Südtirol-Alto Adige.⁹² As the official website of the initiative indicates, “BrennerLEC aims at making traffic along the Brenner axis more respectful of the local population’s health and more compatible with the geographical features of the land, in order to protect the particular Alpine environment crossed”.⁹³ It is interesting to note that the Project has made it possible to verify that reducing speed in some sections can lead to pollution reductions and safety improvements.⁹⁴

86 See N. Bertuzzi *et al.* (eds.), *Interview Report, supra*, at 30.

87 *Ibid.*, at 28.

88 See, in addition, article 1 of L.P. Trento 12/2010, *Legge provinciale sulle piste ciclabili*, which states (in Italian) that “[...] the Province promotes mobility and cycling to promote intermodality and the best use of the territory [...]”.

89 See N. Bertuzzi *et al.* (eds.), *Interview Report, supra*, at 28.

90 For more information, see <https://corridoiodelbrennero.provincia.tn.it/>.

91 LEC stands for Lower Emissions Corridor.

92 Source: <http://www.appa.provincia.tn.it/brennerlec>.

93 Source: <https://brennerlec.life/the-project>.

94 Source: <https://www.giornaletrentino.it/cronaca/brennerlec-finita-la-sperimentazione-biossido-di-azoto-ridotto-del-10-sull-a22-1.3010329>.

4 Conclusions

Several strategies and initial changes in legislation concerning transport and mobility, in terms of greater respect for the environment, have been published at all levels of administration and government in the last few years. The goal of decarbonizing our mobility system is set.

Despite the geographical and political differences that may distinguish Austria from Italy, i.e. the two countries to which the focus of this study is addressed, it is equally true that this study has allowed us to highlight how these differences tend to diminish when analyzing transport policy in relation to the issues of environmental pollution and climate change. There is a plurality of reasons for this: one reason may be related to the fact that national policies must take into account those developed at the EU level; another may depend on the specific geographical context taken as a reference, namely that of Tyrol and Vorarlberg for Austria, and Autonomous Provinces of Trento and Bolzano for Italy, which is similar from a landscape point of view, making the solutions adoptable in terms of sustainability applied to the sector in question suitable for reverberation; there are also objective correspondences present in the legislation, for example in the CVD (see section 2.2), which establishes, for Austria and for Italy, the same parameters as regards the minimum procurement targets for the share of clean light-duty and clean heavy-duty vehicles. These analogies are clearly emphasized, for example, in relation to local public transport, which both Austria and Italy tend to place increasing value on.

It is therefore important to increase transport by bus and rail, in the face of a reduction in private traffic (from this point of view and in general terms, the emancipation from the sometimes “forced” use of private cars gives a good idea of the meaning of the quotation that opens this chapter). This rings even more true in specific geographical contexts, such as those taken as a reference in this research work, which require particular attention from the environmental point of view so as to preserve their natural peculiarities (as well as, of course, the health of the people who live there).

Alongside local public transport and shared and collaborative mobility services, soft mobility,⁹⁵ a form of mobility which “includes all forms of non-motorized transport (NMT) that use only the “human energy” (Human Powered

95 Similarly, “[a]ctive mobility (or active transportation) is the generic term for all non-motorized travel modes. Prime examples are walking and cycling” (see S. Winter and S. Goel, *Smart Parking in Fast-Growing Cities: Challenges and Solutions* (TU Wien Academic Press 2021), at 80).

Mobility)",⁹⁶ is also relevant. This is due to "soft mobility (pedestrian, cycle and other not motorized displacements) [being] a "zero impact" mobility".⁹⁷ Also from this point of view, the research showed a convergence of intentions towards forms of soft/active mobility between the different territorial contexts considered.

Finally, it should be pointed out that sustainable mobility also requires a change of mentality in people, through the formation of an awareness of the benefits (not only in environmental terms) to which it can lead.

In conclusion, from a more practical perspective, it could be useful to indicate some important actions that would require rapid implementation:

1. Clear and target orientated EU directives und regulations to strengthen active mobility, public modes of transport and better efficiency in our mobility

National and regional governments will only focus on climate friendly transport modes if the rules of play are coordinated and harmonized throughout Europe. Examples on the European level that can be mentioned are:

- harmonized speed limits,
- true cost pricing between road and rail,
- fair and climate orientated taxation for commuters,
- faster ban of fossil-fuel driven vehicles, ...

2. A clear focus on active short distance mobility

There must be a clear priority on active mobility. This could be achieved especially in urban and densely populated areas in the Alpine space by shifting road space from vehicle traffic to bicycles and pedestrians. The change of use of some roads in urban areas and returning these for communications and living purposes will be a key factor in achieving our targets. This is not a step backwards in our quality of life but can represent – if done in the right way – a great step forward and a significant increase in living standards in the Alpine regions.⁹⁸

3. Public transport is the backbone of our future mobility

96 R.A. La Rocca, "Soft Mobility and Urban Transformation: Some European Case Studies", *TeMALab Journal of Mobility, Land Use and Environment*, 2 (2009) 85–90, at 85.

97 *Ibid.*, at 85.

98 In Tyrol and Vorarlberg there are many examples of best practice in new use of existing road infrastructure: e.g. Prutz, Silz Innsbruck, Hart, ("*Begegnungszone*") or pedestrian zones e.g. in Bregenz and Innsbruck. Similarly, as regards the Autonomous Provinces of Trento and Bolzano, e.g. in terms of cycling/pedestrian zones.

Investing in rail and bus infrastructure is necessary. Offering a high quality (fixed interval service, customer orientated tariff systems,...) even in rural areas is crucial to enabling citizens and tourists to make the shift to climate-friendly modes of transport. Investments in such infrastructures might also allow policy-makers to pursue a better CPI with a fruitful interrelation between spatial planning and transport sectors at the subnational level on the one hand and a major incentive to encourage the use of public transport and reduce the use of private vehicles on the other hand. If we are to change people's behavior, it is time to divert and increase financial resources to rail and bus services.⁹⁹

4. Sustainable mobility needs not only to be climate friendly, it also has to fit social requirements.

We do not have a traffic problem in the rural areas of the Alpine region – yet we have a mobility problem. About 40% of all citizens (younger than 18 and mostly older than 65) are not able or willing to drive a car. We have to offer car-free modes of mobility in order to treat citizens equally and not engage in discrimination (shared mobility, for example in terms of sharing micro-mobility, could also be useful from this point of view).

99 As regards Italy, for example, “the National Recovery and Resilience Plan (PNRR) [...] provides for the development of more sustainable local transport, with an estimated expenditure of 8,580 million euros. Additional resources are foreseen for [...] investment in electric buses” (see in Italian: https://temi.camera.it/leg18/temi/t18_il_trasporto_pubblico_locale.html).

In Austria, the *Bund* started in 2021 to invest more money in regional and local public services (100 Mio. €/year). The *Länder* and the Communities have increased their budget every year in the last decade.

Energy and Water

Giada Giacomini and Arnold Autengruber

1 Introduction

Energy and water are closely linked to one another within the specifics of the regions to be examined in the context of climate change. Especially hydro-power plays a major role in achieving climate policy objectives in the energy sector.¹ Energy and water are therefore two interrelated policy sectors when it comes to effectively combatting climate change by avoiding the release of polluting emissions into the environment.² In this regard, such interrelation embodies a case of climate change policy integration (CPI) in itself. Based on the relevance in the field of climate change mitigation, the emphasis of this chapter will be put on energy policies in the Italian Autonomous Provinces of Trento and Bolzano, and in the Austrian *Länder* of Tyrol and Vorarlberg, whereas the field of water will mainly be dealt with in the context of hydro-power. This chapter will also highlight problems and flaws relating to the same sectors, drawing upon the results of the interviews conducted within the Eurac project “Climate change integration in the multilevel governance of Italy and Austria”.³

1 For Vorarlberg “Strategie Energieautonomie + 2030”, at <https://www.energieautonomie-vorarlberg.at/zoolu-website/media/document/3817/Strategie+Energieautonomie%2B+2030>, at 39. See for Tyrol *Ressourcen- und Technologieeinsatz- Szenarien Tirol 2050 – Bericht*, at https://www.tirol.gv.at/fileadmin/themen/umwelt/wasser_wasserrecht/Downloads/19-0308_Szenarien-Tirol-2050_Endbericht-Stand-18-10-15.pdf, at 20. All internet sources in this chapter were accessed on 9 May 2022.

2 See E. Schulev-Steindl, “Die Verantwortung des Staates bei der Energiewende”, *RdU-UT*, 6 (2014) 90–102, at 99. The importance of hydroelectric power for a secure energy supply, in particular also for reducing GHG emissions, is undisputed in the scientific community. See amongst others R. Koubek, “Systembetrachtung CO₂-Reduktion”, *Elektrotechnik und Informationstechnik*, 129 (2012) 367–373, at 370.

3 Research project “Climate Change Integration in the Multilevel Governance of Italy and Austria: Policy-Making and Implementation in Selected Subnational Policies” funded by the Autonomous Province of Bolzano program Research Südtirol/Alto Adige 2019.

2 Italy's Autonomous Provinces

2.1 Preliminary Remarks

Energy policies are deemed crucial as far as the establishment of effective strategies for the reduction of greenhouse gas (hereinafter GHG) emissions in the atmosphere is concerned, and thus in the mitigation of climate change impacts. In relation to this, the energy sphere is characterized by a great quantity of laws and policies in the Autonomous Provinces of Trento and Bolzano/Bozen, data that has clearly emerged since the first phase of the research project. This section will outline the main legal and political initiatives in the two Italian Autonomous Provinces, highlighting how these are playing a crucial role in the fight against climate change. It will do so by engaging with the key sectoral documents, but also by drawing upon the outcomes of interviews conducted with sectoral experts.

D.P.R. 235/1977 as modified by D.lgs. 463/1999 defines the “Rules for the implementation of the Autonomous Statute of the Trentino Alto Adige Region in the field of water, water works and concessions of large hydroelectric derivations, production and distribution of electricity”. It provides for the transfer to the Autonomous Provinces of Trento and Bolzano, for their respective territories, of the legislative and administrative functions in the field of energy exercised either directly by the central and peripheral organs of the state or through public bodies and institutions of a national or supra-provincial character. Competences are also defined in article 9(1) No. 9 of the Autonomy Statute, which includes small water derivations under the competences of the Autonomous Provinces.⁴

2.2 Energy – Bolzano and Trento

The Autonomous Province of Bolzano/Bozen, located in the Italian Region Trentino-South Tyrol, holds a particular status within the national legal system, entrenched in its 1972 Autonomy Statute. The Province has adopted its own climate policies and can directly integrate the EU legal framework into its territory for those matters that fall within its legislative powers and overlap with climate change. Directive 2009/28/EC, launched to stimulate the growth of renewable energy sources (RES), imposes binding targets on member states. The EU requires that each country, by 2020, reaches the share of energy from RES in the gross final consumption of energy assigned as a target (for Italy,

4 See also M. Alberton and F. Cittadino, “La tutela dell’ambiente”, in W. Obwexer *et al.* (eds), *L’impatto dell’Unione europea sull’autonomia legislativa ed amministrativa dell’Alto Adige/Südtirol* (ESI 2015) 471–514.

17%). With regard to energy efficiency criteria, the goal is to achieve a 20% improvement in energy efficiency by 2020. The law that regulates energy savings, renewables and climate protection in Bolzano was L.P. 9/2010, now substituted by L.P. 10/2018.⁵

To contribute to those targets, the Province of Bolzano adopted its first Climate Plan “South Tyrol Energy 2050” (now *Piano clima Alto Adige 2040* or *Klimaplan Südtirol 2040*) back in 2011 in light of the objectives adopted at national and international level. The Plan is currently under review with a view to adopting a new, more ambitious version in 2022. Bolzano also adopted in 2019 a Sustainability Strategy (hereinafter Strategy) that operates in conjunction with the Climate Plan. The Strategy prescribes an important objective in relation to climate change – in fact, climate change is one of the Sustainable Development Goals (hereinafter SDGs). Thus, the Climate Plan functions as a perfect example of CPI and as an operationalization of the Sustainability Strategy. It also contains important trackers that help in pursuing the SDGs’ objectives.⁶

Regulation of the energy sector is one of the most important features of both the Climate Plan and the Strategy. The Climate Plan illustrates how the Province of Bolzano can build a low-emission economy while consolidating its position in terms of international competitiveness. In the Plan, the energy sector is deeply intertwined with other sectors, which include water and its implication with the production of renewable energy.

The Climate Plan has the primary objective of reducing the annual CO₂ emissions deriving from energy consumption per inhabitant to below 1.5 tonnes (one third lower than the per capita emissions in 2008) and the consumption measured as continuous output per capita to below 2200 W.⁷ It aims to reach these targets by pursuing different strategic priorities simultaneously: energy savings and increased energy efficiency in all strategic sectors; reducing dependency on fossil fuels and substituting these with RES; reducing CO₂ emissions, and building a culture of sustainability.⁸ The tools used by the Province of Bolzano in order to reach the emission reduction ambitions are economic

5 See http://lexbrowser.provinz.bz.it/doc/it/lp-2010-9/legge_provinciale_7_luglio_2010_n_9.aspx.

6 Also see the Sustainability Strategy website at <https://sostenibilita.provincia.bz.it/it/home>, and the SDGs trackers for the Province of Bolzano, at <https://astat.provinz.bz.it/barometro/upload/sdg/html/it/index.html>.

7 *Piano Clima Energia-Alto Adige-2050*, now partially replaced by *Piano clima Alto Adige 2040*.

8 *Ibid.*, at 23.

instruments such as incentives (monetary and non-monetary), taxation (such as water charges, as we shall see later in the chapter), as well as non-economic strategies such as education, awareness and information strategies, and target-oriented research funding.⁹

The Climate Plan outlines several “axes of intervention” that will be decisive in achieving the objectives of the strategic priority areas. The energy-related axes are defined as management of energy supply and the smart use of energy. One of the most important aims of the Province of Bolzano is to meet the energy demand with renewable sources produced locally. However, the Climate Plan clarifies that “if the demand for electricity cannot be met by means of local sources in a sustainable way, energy is to be imported from other regions”.¹⁰ Among the initiatives, the Green Corridor Project (Brenner LEC) is being implemented along the Brenner highway. The project aims to make the area along this corridor an international model for energy efficiency and to supply it entirely with energy from RES in the coming decades.¹¹ Additionally, with regard to the energy efficiency requirement, South Tyrol is especially suitable for the construction of pumped-storage plants and water reservoirs, as we shall see in the next section in relation to water policies, sustainable energy and climate change.

Another important sector related to the smart use of energy in the Province of Bolzano is the construction of solar facilities for hot water production and the thermal insulation of buildings. As outlined in the Climate Plan, the average energy consumption of households was to have been cut by 20% by 2020, with a view to increasing this to 35% by 2050 compared to 1990 levels.

The interviews conducted within the project have helped to shed light on how the emission reduction objectives are being achieved in the Province of Bolzano. The interviewees affirmed that fundamentally two priorities are being followed: first, to reduce energy consumption in all areas (construction, transport, production processes in the private sector, etc.); second, to decarbonize the remaining abovementioned energy requirements set out in the Climate Plan.

9 See Chapters in 8 and 9 in this volume.

10 *Piano clima Alto Adige 2040, supra*, at 32.

11 The green corridor is an idea that combines the development of road and rail infrastructure with the proposal for a model of low energy consumption, low pollution and low surface consumption, in which maximum attention would be paid to the quality of life of the resident populations. See also Brenner LEC website: <https://brennerlec.life/>, and Chapter 4 in this volume.

According to an interviewee, the construction sector is crucial for the energy efficiency objectives or the overall reduction of the environmental footprint in the construction sector.¹² The respondent asserted that it is well known that the large-scale building industry is the world's highest energy and raw material consumer, and also the largest producer of waste and emissions (it accounts for about 40% of our total energy consumption) and is responsible for over a third of CO₂ emissions.¹³ This is why the inhouse agency *CasaClima*, with its system of energy certifications for buildings, is regarded as one of the most important allies in energy savings and therefore indirectly in climate change mitigation.¹⁴ It has been demonstrated that a *CasaClima*-certified house consumes 10% less energy compared to the existing average building, and also covers a large part of its needs from RES. This is crucial insofar as building in a sustainable way and upgrading existing buildings are the most effective and cheapest measures to reduce our environmental impact.¹⁵ Another important initiative according to the latter stakeholder is constituted by the national sustainability report, because it is a crucial tracker for emissions reductions, presenting information also on a provincial basis.¹⁶

Among the other initiatives related to the energy sector, the interviews highlighted the importance of the introduction (in 2012, now extended until 2026) of the “*Bonus cubatura*”. In the case of new buildings, where more than 50% of the total volume is intended for residential purposes, the above-ground eligible area can be increased by 10% if (1) the whole building meets *CasaClima* standards and, in addition, (2) the rules on building materials and the coverage of electricity needs from RES are met.

In conclusion, some final remarks on the actual reduction of GHG emissions are due in order to understand to what extent the Province of Bolzano is going to meet its targets. According to the monitoring reports of the Provincial Agency for the Protection of the Environment and the Climate (*Agenzia Provinciale per l'Ambiente e la Tutela del Clima*) the actual coverage of the needs with energy produced from RES amounted to almost 70% in 2014 and then

12 IntBZ_08.

13 IntBZ_08.

14 Throughout the interviews, the initiative *CasaClima* has been widely mentioned and their initiatives illustrated by many stakeholders (IntBZ_02; IntBZ_03; IntBZ_08; IntBZ_09). More information is available at <https://www.agenziacasaclima.it/it/home-1.html>.

15 IntBZ_08.

16 The 2022 Sustainability Report is available at <https://research.cerved.com/>.

decreased slightly in subsequent years.¹⁷ As the Agency has reported, this fluctuation also depends on the availability of RES (sun and water) during the year, and fluctuations in the annual water balance, due to the strong dependence on hydropower. The monitoring mechanism also outlines that South Tyrol ranked second in Italy and at the European summits for the coverage of energy needs from RES.¹⁸

The other two indicators used to track progress of the Climate Plan implementation are “energy efficiency” and the “per capita energy intake”. These indicators are calculated by dividing the provincial energy consumption by the number of inhabitants and the number of hours during which energy is used per year. According to the Agency website, the value of the energy efficiency indicator increased sharply until 2010 and then decreased until 2014. It then rose to values close to those of 2010 in 2018. The website reports that: “there is no doubt that further efforts are needed to reach the target of 2,500 W per capita by 2020. The key to the future is energy efficiency in all sectors”.¹⁹ In relation to the per capita CO₂ emissions, the website reports that these have lower values compared to other settings in Italy thanks to the widespread use of renewable energy sources and efficient use of energy, and the absence of particularly energy-intensive production lines. Emissions dropped below 4.25 tons per capita in 2014 and then rose slightly again in the following years.²⁰ However, no further data is available at the moment with regard to the last few years.

Turning now to the Autonomous Province of Trento, there is a long history of environmental and energy planning in this area, which dates back to the 1980s and 1990s. In the beginning, the main focus when discussing energy was on ensuring energy security and the provision of energy in the mountains and valleys. It is only more recently (since 2010) that there has been a focus on the reduction of GHG emissions in order to avoid the worst climate change impacts. Like for the Province of Bolzano, also in Trento climate change policies are closely intertwined with plans for the reductions of GHG emissions. In 2010, the Trentino Provincial Climate Law provided for the reduction of greenhouse gas emissions by 50% compared to 1990 levels by the year 2030 and 90%

17 Monitoring tools are available at <https://ambiente.provincia.bz.it/energia/piano-clima-energia-alto-adige-2050.asp>.

18 Also see the Agency website at <https://ambiente.provincia.bz.it/energia/piano-clima-energia-alto-adige-2050.asp>.

19 *Ibid.*

20 *Ibid.*

by the year 2050, in line with the European pathway of almost complete decarbonization by 2050.²¹

The most important document for energy regulation and policy is the Energy and Environmental Provincial Plan (hereinafter PEAP). The PEAP 2021–2030 takes into account as a general objective to 2030 the goal set in article 23 of L.P. 19/2013, which concerns the objective of reaching a climate-neutral Province by 2050 in line with the objectives of both the Paris Agreement and L.P. 20/2012.²² The PEAP initially had the objective of reducing CO₂ emissions by 300,000 tonnes in 2012 through the promotion of energy efficiency and RES mainly for civil purposes.²³ The adoption of the Paris Agreement has marked a new era for the definition of climate change strategies in the Province of Trento, which adopted a new PEAP for the period 2021–2023. In this document, adopted in June 2021, it is reported that “the implementation of the strategy of this Plan and therefore of its twelve strategic lines is one of the most significant steps for Trentino in achieving the overall goal of reducing climate-altering emissions to 2030 by 55% compared to 1990”.²⁴ The PEAP instrument operatively interconnects the Provincial Strategy for Sustainable Development and the Provincial Strategy for Mitigation and Adaptation to Climate Change.²⁵

21 L.P. 5/2010, available at <https://www.consiglio.provincia.tn.it/leggi-e-archivi/codice-provinciale/Pages/legge.aspx?uid=21336>.

22 This provincial law concerns the implementation of art. 13 of Directive 2009/28/EC of the European Parliament and of the Council of 23 April 2009 on the promotion of the use of energy from renewable sources, amending and subsequently repealing Directives 2001/77/EC and 2003/30/EC. Art. 1 reads: “The Autonomous Province of Trento, [...] promotes and coordinates, with the involvement of public and private entities, initiatives aimed at a rational use of fossil energy sources, the enhancement of renewable energy sources, energy efficiency and energy savings, as well as an overall improvement in the quality of life, in the context of a sustainable development model, while reducing, emerging negative externalities that could cause damage to the social life of the territory and its economy”.

23 The full version of the PEAP is available at http://www.energia.provincia.tn.it/binary/pat_agenzia_energia/piani_programmi/piano_1_1227689145.pdf. L.P. 20/2012 is the law on Energy Act and implementation of article 13 of Directive 2009/28/EC of the European Parliament and of the Council of 23 April 2009 on the promotion of the use of energy from renewable sources.

24 Provincia Autonoma di Trento, *Piano Energetico-Ambientale Provinciale 2021–2030* (Trento 2021), at 271.

25 See also website of the Strategy for sustainable development at <https://agenda2030.provincia.tn.it/Trentino-2030/Strategia-provinciale-SproSS>, and <http://www.climatrentino.it/>. Also see the Resolution No. 1306 of 7 August 2021 of the Provincial government of Trento.

The document was drawn up also through consultation with civil society and private companies.²⁶

The PEAP aims to reduce GHG emissions by targeting specific areas that can be identified as the regulatory-normative sector, economic and financial resources, education, and research and innovation among others. The top priority concerns the upgrading of buildings. The objective in the building sector is to increase the use of energy storage systems through the institution of a methodology for building certification. This objective and relative method of actuation can be considered similar to the Bolzano's *CasaClima* certification system, because energy efficiency is achieved through building certification. Moreover, the Province of Trento wishes to reach the emission reductions objective of the certification system through "careful consideration of the contribution of woody biomass in buildings energy certification", therefore energy from RES.²⁷ Another interesting measure in the PEAP is represented by the "energy mortgage", which promotes banking products that promote the restoration of buildings to make them energy-efficient and finances the purchase of high energy-saving class housing.

As far as industrial production is concerned, the PEAP devotes a special part to "highly-efficient industry" which includes consulting services to private stakeholders and the subsequent steps for the implementation, financing, monitoring and certification of product sustainability. This strategy also concerns the "dissemination of company energy diagnostics", meaning that the Province will promote the drafting of energy audits in favor of those companies not obliged by D.lgs. 102/2014, in order to be able to identify potential energy efficiency interventions, with achievable costs and savings.²⁸ In addition, the PEAP promotes the identification of economic and financial instruments and mechanisms that favor the installation of photovoltaic systems on roofs and

26 The reports of PEAP consultation are available on the APPA website: <http://www.energia.provincia.tn.it/peap/-categoria8/pagina33.html>.

27 *Piano Energetico-Ambientale Provinciale 2021–2030*, *supra*, at 273.

28 The D.lgs. 102/2014 concerns the implementation of Directive 2012/27/EU on energy efficiency, amending Directives 2009/125/EC and 2010/30/EU and repealing Directives 2004/8/EC and 2006/32/EC. The legislative decree establishes that the national energy saving target consists in the reduction, by the year 2020, of 20 million tons of oil equivalent of primary energy consumption, 15,5 million tons of final energy oil equivalent, calculated from 2010, in line with the National Energy Strategy. In article 10 of the decree are enumerated the entities which had to share their energy data in order to draft an assessment of the national application potential of high-efficiency cogeneration and efficient district heating and cooling.

industrial facades, potentially combined with self-consumption solutions.²⁹ Finally, another point worth of consideration is the objective of the promotion of energy management systems such as ISO 50001 standard³⁰ through information and awareness initiative for small and medium-sized enterprises.³¹

In terms of the actual implementation of energy policies in the Province of Trento, the PEAP 2021–2030 highlights the main trends in energy consumption and GHG emissions. Comparing data from 2008–2009–2010 and 2014–2015–2016, there has been a 15% decrease in consumption in Trentino. Reductions are most noticeable in the use of fossil fuel from the transport sector. Furthermore, the year 2016 registered a reduction of -20% compared to 1990 levels.³²

While this data is a herald of hopes for the future of climate change mitigation, the interviews conducted reveal a partially different picture for the Province of Trento. The initial draft of the 2021 PEAP, for example, had anticipated goals that were introduced in EU legislation only later (e.g. reducing GHG emissions by 55% by 2030). As was outlined in one interview, “in Italy, the adoption of European directives related to energy has not taken place in suitable timeframeshowever, fortunately there is the possibility to legislate on a provincial level, skipping the state level and considering the European level directly”.³³ However, as maintained by other interviewees, significant limits and obstacles remain in effectively contrasting climate change within the current politics conducted by the Province of Trento: in particular, it was outlined that there is such a “scarce amount of renewable energy, that they only took into consideration solar panels and hydroelectric energy” This means that in the definition of the instruments for the PEAP’s energy efficiency targets, significant limits and obstacles remain in effectively combatting climate change in the current politics conducted by the Province of Trento: in particular more investment on RES has been identified as the best solution.³⁴

29 Provincia Autonoma di Trento, *Piano Energetico-Ambientale Provinciale 2021–2030*, *supra*, at 277.

30 See <https://www.iso.org/iso-50001-energy-management.html>. ISO stands for International Organization for Standardization.

31 This measure implements art. 8 of the Ex. D.lgs. 102/2014 as amended by Ex. D.lgs. 73/2020. The latter concerns the implementation of EU Directive 2018/2002 amending Directive 2012/27/EU on energy efficiency.

32 L. Boschini *et al.*, *Rapporto Ambientale – Piano Energetico Provinciale 2020* (Provincia Autonoma di Trento 2020), at 37; *Piano Energetico-Ambientale Provinciale 2021–2030*, *supra*, at 34.

33 IntTN_05.

34 IntTN_11.

Furthermore, according to the accounts of both interviewed experts and administrative staff, the main driver in the various plans has always been mitigation measures, while adaptation measures lag behind. Only in the 2021 PEAP was there an increase in the number of adaptation measures.

Another critical feature of the PEAP is that, although it contains a specialist technical scenario report authored by scientific experts (*Fondazione Bruno Kessler*, University of Trento, *Fondazione Mach*), there was a lack of effective involvement from civil society associations in the elaboration of the plan. According to an interview, the PEAP lacked the participation of environmental associations.³⁵ This was due perhaps to the large number of pages and information contained in the PEAP (more than three-hundred pages) which make the document very difficult to understand overall. Both the administrative sources and interviewees from civil society organizations attributed this lack of participation to negative previous experiences which had led to a certain degree of mistrust on the part of civil society and the impression that the parties were involved solely for the sake of personal visibility and not to be meaningfully involved in the drafting process. Nevertheless, one interviewee insisted that many of the observations made by civil society associations during consultation were taken into account.³⁶

2.3 *Water and Hydroelectric Power – Bolzano and Trento*

All the energy produced in the Province of Bolzano comes from RES, such as hydroelectric power and wood biomass. According to the ASTAT (*Istituto provinciale di statistica* – Provincial Institute for Statistics) report, the production of energy from hydroelectric power has grown consistently: already in 2012, it represented 92% of the electricity produced in the Province of Bolzano.³⁷ According to the SDG tracker for Goal 7 on clean energy, in South Tyrol the share of energy from RES in gross final energy consumption was 64,2 in 2018.³⁸

35 IntTN_05.

36 IntTN_05. For an account on the participatory mechanism of the PEAP, see Chapter 9 in this volume. Also consult the website of the Agenzia Provinciale per la Protezione dell'Ambiente (APPA Trento) at: <http://www.energia.provincia.tn.it/peap/-categoria8/pagina33.html>.

37 Istituto Provinciale di Statistica, *ASTAT Info n.48 07/2014* (Provincia Autonoma di Bolzano 2014).

38 The reference indicator for monitoring progress towards the Europe 2020 renewable energy targets set by EU Directive 2009/28/EC on the promotion of the use of energy from renewable sources. The calculation is based on data collected under Regulation (EC) No 1099/2008 on energy statistics, some of which obtained by applying calculation criteria specifically introduced by the Directive (for example, standardization of electricity production from water and wind). See also SDGs trackers at https://astat.provincz.bz.it/barometro/upload/sdg/html/it/detail_7.html#measurement-7.2.1.10.

In the Climate Plan, it is reported that “In South Tyrol there are currently 30 power plants with an installed power of over 3 MW. Alongside these large power plants, there are another 784 small power plants with an installed power of < 220 kW and 116 plants with an installed power > 220 kW and < 3 MW. These small power plants produce a total of 775 GWh of electricity (about 25% of South Tyrol’s power demand, situation in 2009)”.³⁹ Therefore, water is an ally of utmost importance in the reduction of GHG emissions and, consequently, in the integration of climate change objectives in the Province of Bolzano.⁴⁰

The main offices that deal with provincial water planning are the Water Protection Office and Water Resources Management Office within the Provincial Agency for the Protection of the Environment and the Climate. Such planning and management initiatives were mainly implemented in the publication of the General Plan for the Use of Public Water (PGUAP – *Piano Generale di Utilizzazione delle Acque Pubbliche*), the first draft of which was approved in 2012. The plan was made operational by D.P.R. 22 June 2017.⁴¹ The most important measure from the point of view of climate change mitigation was the introduction in 2019 of new water charges, pursuant to L.P. 10/2019 and to its implementing resolutions 857 and 848 of November 2020. These two resolutions are important because they define water fees for different water uses and, concerning irrigation use, they provide a set of fee reductions for those users who apply sustainable practices, such as saving water through the use of reservoirs.

However, because of climate change impacts and their severe consequences, the availability of water and the water runoff in winter and summer will undergo serious alterations in the Province of Bolzano and Trento as well. The effects of climate change predicted for the rainfall patterns will change the availability of water resources, in particular by altering the seasonality of outflows in surface watercourses, among others negative climate impacts that will occur. One interviewee affirmed that climate change certainly has an impact on the availability of water, so limited availability of water should be taken into account when granting concessions to new hydroelectric power stations.⁴²

39 Piano Clima Energia-Alto Adige-2050, *supra*, at 61. MG stands for megawatt, kW for kilowatt and GWh Gigawatt hours.

40 A comprehensive list of hydroelectric power stations is available on the Provincial Agency website: https://ambiente.provincia.bz.it/pubblicazioni.asp?publ_action=4&publ_article_id=231509.

41 The full version of the General Plan can be accessed here: <https://ambiente.provincia.bz.it/acqua/piano-generale-utilizzazione-acque-pubbliche.asp>.

42 IntBZ_03.

This is foreseen in the PGUAP, which, in its Part 3 (article 40, paragraph 2), gives mandate to the provincial council to identify by resolution those “areas characterized by drought or recurrent situations of water supply crisis”. For such droughty areas, a specific plan will be established aimed at ensuring sustainable water use and achieving good quality status.

Turning now to the Province of Trento, the Plan for the General Management and the Use of Public Water (*Piano di Gestione Generale dell'Utilizzazione delle Acque Pubbliche*) was launched in 2006 through the Executive Decree of the President of the Republic of 24 May 2006.⁴³ The Plan, which is organized along the district lines of the rivers Po and Adige, is about to be adopted, and it will integrate climate change concerns.⁴⁴ In fact, the new plan 2022–2027 contains adaptation measures in “Allegato M”.⁴⁵ The Plan condenses the principles of the two main European directives dealing with water; the Water Framework Directive 2000/60/EC and the Floods Directive 2007/60/EC. The main measure of the Plan concerning hydroelectric derivations is the Environmental Flow,⁴⁶ which after having been applied in 2009 only to large hydroelectric derivations, entered into full force in 2017 with the application of the measure to all existing derivations with very few exceptions.⁴⁷

In the PEAP water policies appear linked to the hydroelectric sector, as in the Climate Plan. Hydroelectric power is an important source of renewable energy in the Province of Trento, which constitutes a very significant portion of Italian hydroelectric production: 82.7% of the electricity produced in Trentino comes from RES, that is, almost exclusively, from hydropower.⁴⁸ The remaining 17.3% comes from cogeneration plants (that is, simultaneous production of electricity and heat) that use fossil fuels. In Italy 3,432 plants are in operation, resulting in gross installed capacity of 18,481 MW, and a gross

43 S. Cappelletti *et al.*, *Piano Generale di Utilizzazione delle Acque Pubbliche – Relazione Illustrativa* (Provincia Autonoma di Trento 2006).

44 The draft New Water Management Plan 2022–2027 is available at http://www.appa.provincia.tn.it/pianificazione/Piano_di_tutela/-Piano_Tutela_Acque/pagina37.html.

45 See http://www.appa.provincia.tn.it/pianificazione/Piano_di_tutela/pagina36.html.

46 The environmental flow is commonly defined as “the river-flow characteristics necessary to maintain the integrity of riverine ecosystems. The concept of environmental flows has evolved over the past half-century, beginning with the development of minimum instream flows necessary to protect a single fish species to current frameworks for holistically including all aspects of river health that depend on natural flow regimes”, see generally R. Morrison and E. Bray, *Environmental Flows* (Oxford University Press 2019).

47 C. Ferrari *et al.*, *Trentino Sostenibile. Verso la Strategia Provinciale di Sviluppo Sostenibile* (Provincia Autonoma di Trento 2019), at 86.

48 *Ibid.*

production of 58,545 GWh. Concerning the hydroelectric sector, the PEAP and New Draft Water Management Plan predict in the relative scenario that until the year 2030 there will be no significant reductions on the annual quantity of outflows. However, uses for hydroelectric derivations could lead in 2030 to an overall reduction in water availability for hydroelectric purposes estimated at up to 2%.⁴⁹ The power produced by the plants located in the Province of Trento in 2014 was equal to about 10.4% of total Italian power.⁵⁰ However, the last report shows a downward trend in the production of hydroelectric energy in the period 2014–2017, due to the change in water availability, while hydroelectric remains the most important source.⁵¹

Moreover, it is reported that the Province of Trento will undergo a process of reallocation of hydroelectric permits for large hydroelectric branches – but it is still unknown when.⁵² According to the report, through this action it will be possible to rationalize the use of water, considering that hydroelectric power stations use about 84% of the availability of superficial water. Additionally, the Provincial Agency for Environmental Protection for Trento and the University of Trento have signed an agreement for the development and application of the MesoHABSIM Methodology within the province of Trento. This consists of an innovative system for monitoring of watercourses that allows for evaluations of the ecological outflow in compliance with Executive Decree 30/2017.⁵³

49 *Piano Energetico-Ambientale Provinciale 2021–2030*, *supra*, at 75.

50 M. Niro, *Rapporto sullo Stato dell'Ambiente – Energia* (Provincia Autonoma di Trento 2016), at 7.

51 M. Niro, *Rapporto sullo Stato dell'Ambiente 2020* (Provincia Autonoma di Trento 2020), at 102.

52 *Ibid.*

53 C. Ferrari *et al.*, *Trentino Sostenibile*, *supra*, at 87. Decrees 30/2017 and 29/2017 are two regulations that the Ministry of the Environment has issued in accordance with the Action Plan 2016 agreed with the European Commission, in relation to some criticalities that the Commission itself had found regarding the district management plans of the waters (Directive 2000/60/CE). Among these criticalities, one in particular (Case Pilot 6011/2014) concerned the need to properly assess the environmental risk generated by the proliferation of small hydroelectric power derivations. See also Italian Ministry of the Environment Website at https://www.mite.gov.it/sites/default/files/archivio/allegati/trasparenza_valutazione_merito/informazioni%20ambientali/15_-_decreti_sulle_valutazioni_ambientali_delle_derivazioni_e_sui_deflussi_ecologici.pdf.

3 Austria – Regulations and Policies

3.1 Preliminary Remarks

The topics of energy and water have many points of contact with climate change, as recognized in the government programs of some *Länder*.⁵⁴ At first glance, however, the *Länder* seem to have only limited scope for action in these areas. Based on the Austrian distribution of competences, the *Bund* is largely responsible for legislation and enforcement in these areas.⁵⁵

On closer inspection, however, it turns out that the *Länder* do have considerable opportunities to exert influence in these areas and have already anchored at least programmatic provisions in connection with climate protection efforts at constitutional level of the *Länder*.⁵⁶ This is not only due to the implementation of various specific regulations in the respective relevant sectors (e.g. facilitations for the approval of photovoltaic systems under building law), but also, and above all, at the level of the creation of economic incentives in the form of subsidies as well as company ownership. Subsidies are mostly granted within the framework of the so-called private sector administration, i.e. by means of a contract. Since this non-sovereign administration forms a

54 Consequently, this is also identified in the current government programs as one of the greatest challenges of the coming years. For Tyrol, the “government program for Tyrol 2018–2023”, https://www.tirol.gv.at/fileadmin/buergerservice/Bilder_Div/Landesregierung_NEU_20182023/Regierungsprogramm_2018-2023.pdf and for Vorarlberg, the “Arbeitsprogramm 2019–2024”, <https://vorarlberg.at/documents/302033/472082/Arbeitsprogramm+2019+-+2024.pdf/42363506-5c70-d126-c847-d72c13a6e0c3?t=1616150574042>.

55 On the qualification of (environmental) energy law as a so-called “cross-sectional matter” with significant competences in favor of the *Bund*, see G. Schnedl, *Umweltrecht* (facultas 2020), margin No. 441 ff. With regard to the far-reaching competences of the *Bund* in the area of water law, see for example J. Müllner, “Art 10 Abs 1 Z 10 B-VG”, in A. Kahl and L. Khakzadeh and S. Schmid (eds.), *Kommentar Bundesverfassungsrecht* (Jan Sramek 2021) 212–228, margin No. 46ff. See also IntT_01, IntT_02, IntT_06. Also see Chapter 2 in this volume.

56 The commitment to sustainable and effective climate protection as a prerequisite for preserving our living space for future generations, as laid down in the respective state constitutions see art. 7(3) *Tiroler Landesordnung 1989* (StF: LGBl 1988/61) as well as art. 7(6) (provides for measures and funding with regard to the policy area of water) and para. 7 (which, in addition to a general implementation on climate protection, primarily states the promotion of measures to increase energy efficiency as well as the sustainable use of renewable energies) *Verfassungsgesetz über die Verfassung des Landes Vorarlberg* (StF: LGBl 1999/9). Further to the regulation in the *Tiroler Landesordnung 1989*: A. Gamper, “Art 7 Tiroler Landesordnung 1989”, in P. Bußjäger and A. Gamper and C. Ranacher (eds), *Tiroler Landesverfassungsrecht* (Verlag Österreich 2020), margin No. 11 ff.

competence-neutral area according to article 17 of the Federal Constitution (*Bundes-Verfassungsgesetz – B-VG*), the *Bund* and *Länder* can also grant subsidies in those administrative areas in which they do not have any legislative and enforcement competence *per se* according to article 10 to 15 B-VG.⁵⁷ Finally, both the *Länder*⁵⁸ and the *Gemeinden* (municipalities)⁵⁹ may establish companies. Tyrol and Vorarlberg have made extensive use of this possibility. Thus, the major energy supply companies of the *Länder* (in Tyrol, the *TIWAG-Tiroler Wasserkraft AG*⁶⁰ and in Vorarlberg the *illwerke vkw AG*⁶¹) are exclusively⁶² or indirectly⁶³ wholly owned by the respective *Länder*. Smaller municipal energy utilities and companies active in the field of water supply and wastewater disposal are also regularly owned solely or predominantly by the public sector.⁶⁴

Although the political or economic influence of the *Länder* from a constitutional perspective may seem small on paper, in reality it is considerably greater. Thus, the programs described in the following are of considerable importance when it comes to questions of CPI by Tyrol and Vorarlberg.

3.2 Energy (Vorarlberg and Tyrol)

Based on general political objectives, the energy-related policies that integrate climate change are multi-layered, especially in two ways. While concrete legislative steps are taken only sporadically considering the distribution of competencies described above, the private sector administration (in the form of subsidies and corporate policy guidelines for major state-owned companies) is the most effective and most frequently used instrument for taking climate change-related measures at the *Land* level.

57 T. Öhlinger and H. Eberhard, *Verfassungsrecht*¹³ (Facultas 2022), margin No. 238. Also see Chapters 2 and 3 in this volume.

58 Based on art. 17 B-VG. See only C. Grabenwarter and M. Holoubek, *Zur Auslegung des Art 17 B-VG* (ZfV 2016), at 16. See also A. Kahl, “Art 17 B-VG”, in B. Kneihns and G. Lienbacher (eds.), *Rill-Schäffer-Kommentar Bundesverfassungsrecht* (Verlag Österreich 2013).

59 Based on art. 116 (2) B-VG. See K. Giese, “Art 116 B-VG”, in A. Kahl and L. Khakzadeh and S. Schmid (eds.), *Kommentar Bundesverfassungsrecht, supra*, 1139–1151, margin No. 17.

60 See the Austrian company register (*Firmenbuch*): FN 44133b.

61 See the Austrian company register (*Firmenbuch*): FN 59202m.

62 For Tyrol.

63 The *illwerke vkw AG* shows *WEG Wertpapiererwerbengesellschaft mbH* as a shareholder with 4.5%, whereby *WEG Wertpapiererwerbengesellschaft mbH* is wholly owned by *Landesvermögen-Verwaltungsgesellschaft m.b.H.*, which in turn shows Vorarlberg as the exclusive owner.

64 For example: *Innsbrucker Kommunalbetriebe Aktiengesellschaft* (Austrian company register: FN 90981x), *Stadtwerke Kufstein GmbH* (Austrian company register: FN 41696v) or *Stadtwerke Bregenz GmbH* (Austrian company register: FN 67988h).

In the interests of close coordination between the *Bund* and *Länder*, a *Bund-Länder* agreement based on article 15a of the Federal Constitution (B-VG) has also been concluded, which aims to increase the efficiency of the energy system by exploiting all possible energy-saving potential. To this end, in accordance with the principle of a cooperative federal state, the agreement is intended to coordinate the instruments at *Bund* and *Länder* level as far as possible, with certain minimum requirements being laid down in particular for the construction of buildings and heating systems.⁶⁵ In addition, there is another *Bund-Länder* agreement within the meaning of article 15a B-VG to favor measures to reduce greenhouse gas emissions in the area of residential and non-residential buildings. The *Länder* thus create subsidy models for residential buildings, which include incentive systems for the purpose of improving thermal insulation as well as the use of ecologically compatible building materials and low-carbon or carbon dioxide emission-free building services systems.⁶⁶ In the following, the measures taken specifically for the *Länder* are to be examined in more detail.

In a government resolution in 2014, the Tyrolean government set the goal of energy autonomy by 2050.⁶⁷ In terms of framework requirements, Tyrol's energy consumption is to be reduced by as much of 50% as possible by 2050 and the share of renewable energies is to be increased by 30%.⁶⁸ Consequently, Tyrol has started a process to initiate this transformation in energy supply. Future generations should cover their own energy needs from domestic sources in order to be no longer dependent on external suppliers. Accordingly, the targeted energy mix for Tyrol⁶⁹ provides for the following composition:

- i. 46% hydropower
- ii. 19% photovoltaics
- iii. 18% biomass
- iv. 12% geothermal and environmental heat
- v. 5% other energy sources

65 See Announcement of the Governor of the Tyrol of 20 June 1995 concerning the Agreement between the Federal Government and the Provinces pursuant to art. 15a B-VG on the Saving of Energy, StF: LGBl (Tyrol) 1995/94. In Vorarlberg, the agreement was announced in LGBl 1995/15.

66 In Tyrol, the agreement was announced in LGBl 2009/62. In Vorarlberg in LGBl 2009/46.

67 Regarding this, see <https://www.tirol.gv.at/landesentwicklung/nachhaltigkeits-und-klimakoordination/klimaschutz-und-klimawandelanpassung/grundlagen-und-ziele-der-klimapolitik/tirol-2050/>.

68 See also IntT_06.

69 See <https://www.tirol2050.at/unser-ziel/szenarien/>.

According to the “*Tiroler Nachhaltigkeits- und Klimastrategie*”⁷⁰ (Tyrolean Sustainability and Climate Strategy), hydropower is Tyrol’s most important energy resource and is to be expanded by a further 2.8 TWh (Terawatt-hour) on balance by 2036 compared with generation in 2011. For this purpose, both new hydropower plants are to be built and existing plants are to be revitalized. This results in an energy potential of around 34,000 TJ/a (Terajoule per annum) by 2036.

Solar energy is to be used in the best possible way by means of photovoltaic systems and solar thermal energy on roofs. If 95% of all reasonably usable roof surfaces of Tyrolean buildings are used, the solar potential will amount to about 15,700 TJ/a of electricity and about 2,200 TJ/a of heat. In addition to focusing on the development of building-integrated solar potential, the expansion of photovoltaic systems on open spaces is also planned.

Biomass energy is to be generated primarily from wood. The annual growth of wood in Tyrol’s productive forest (“*Ertragswald*”) amounts to 1.8 million solid cubic meters of harvestable product, which corresponds to a theoretical energy content of about 16,000 TJ/a. The wood used for energy in Tyrol includes energy wood harvested in Tyrolean forests on the one hand, but also sawmill by-products. In addition, biogas (potentially around 1,500 TJ in 2050), waste (around 2,300 TJ in 2050), wind power (around 900 TJ/a in 2050), environmental heat and deep geothermal energy will represent further pillars of the future energy supply in Tyrol.

The objectives declared in this way are to be achieved on the one hand (especially in the area of hydropower) via the Land-owned TIWAG *Tiroler Wasserkraft AG*. In other areas, Tyrol acts primarily through steering measures by means of corresponding subsidies.

In January 2020, Tyrol published a hydrogen strategy (following the signs of technological development) including a plan that focuses primarily on both the creation of appropriate framework conditions and the initialization and implementation of hydrogen projects.⁷¹ Concrete steps have already been taken to implement these general goals, and comprehensive measures have been enacted in the area of provincial legislation, particularly with

70 On this and the following, see *Tiroler Nachhaltigkeits- und Klimastrategie*, https://www.tirol.gv.at/fileadmin/themen/landesentwicklung/raumordnung/Nachhaltigkeit/Nachhaltigkeits-_und_Klimakoordination/Publikationen/Nachhaltigkeits-und-Klimastrategie_2021.pdf, at 22.

71 See <https://www.standort-tirol.at/unternehmen/hydrogen-austria/wasserstoff-in-oest-erreich>.

regard to energy-efficient construction.⁷² These follow from amendments to the *Tiroler Bauordnung 2018*⁷³ (Tyrolean Building Code), the *Technische Bauvorschriften 2016*⁷⁴ (Technical Building Regulations), but also the *Tiroler Gas-, Heizungs- und Klimaanlagegesetz 2013*⁷⁵ (Tyrolean Gas, Heating Systems and Air Conditioning Act) and the *Tiroler Bauproduktegesetz 2016*⁷⁶ (Tyrolean Construction Products Act).⁷⁷ This combination of legislative measures results in particular in corresponding requirements to increase the energy efficiency of buildings as well as the avoidance of the use of fossil fuels in the field of supplying energy for buildings.

Apart from initial legal steps, a comprehensive subsidy program to stimulate private investments in climate-friendly forms of energy (photovoltaics, battery storage options, heat pumps, central heating system with biomass as well as implementation of an ecological construction method and use of sustainable materials) has also been adopted and implemented by the *Land* within the framework of subsidy administration.⁷⁸ Further, there is a regular exchange with the *Bund* on subsidies.⁷⁹

In addition, there are think tanks and competence centers initiated by the *Land*, such as the platform “*Plattform Klima, Energie und Kreislaufwirtschaft*”, in which *Land* Tyrol, *Energie Tirol*,⁸⁰ *Klimabündnis Tirol*⁸¹ and *Standortagentur Tirol*⁸² pool their knowledge and expertise in order to set new standards and achieve a high degree of dissemination.⁸³

72 The *Tiroler Elektrizitätsgesetz 2012* (StF: LGBL 2011/134) must not be deceptive about the scope of design concerning energy legislation at the *Land*-level, since it is less a completely independent law and more an implementing act for the *Elektrizitätswirtschafts- und -organisationsgesetz 2010* of the *Bund* (StF: BGBL I 2010/110). In other words, the purpose of the *Tiroler Elektrizitätsgesetz 2012* is to implement laws of the *Bund*.

73 StF: LGBL 2018/28.

74 StF: LGBL 2016/33.

75 StF: LGBL 2013/111.

76 StF: LGBL 2016/41.

77 For further details on the whole K. Weber and I. Rath-Kathrein, *Kommentar Tiroler Bauordnung 2018* (Verlag Österreich 2019).

78 See <https://www.energie-tirol.at/foerderungen/neubau-foerderungen-in-tirol/>.

79 IntT_02.

80 *Energie Tirol* is an independent consulting agency of the *Land* Tyrol and a contact for all energy issues.

81 *Klimabündnis Tirol* is a registered association (“*Verein*”) and part of the largest municipal climate protection network in Europe. The global partnership connects more than 1,700 municipalities from 27 countries in Europe.

82 *Standortagentur Tirol* is a service company of the *Land* Tyrol and assists companies, research institutions, municipalities or regions in their growth, digitization and start-up projects and supports them in networking regionally, nationally and internationally.

83 See <https://www.standort-tirol.at/unternehmen/klima-energie-und-kreislaufwirtschaft>.

Finally, the *Land*-owned energy company *TIWAG-Tiroler Wasserkraft AG* (which not coincidentally seeks to attract customers under the slogan “*saubere Energie für Tirol*” – clean energy for Tyrol) also plays a leading role in the energy policy integration of climate change mitigation measures. Private and corporate customers as well as public institutions at the *Länder* and municipal level are offered products in the areas of electricity (in addition to the offer of 100% electricity generated from sustainable energy sources in Tyrol).⁸⁴ This also includes the implementation of photovoltaic projects⁸⁵ as well as the corresponding subsidy processing⁸⁶ and gas, heat⁸⁷ and energy consulting,⁸⁸ in order to provide every consumer with easy access to such offers. In line with the energy policy strategy of Tyrol as the sole owner of *TIWAG-Tiroler Wasserkraft AG*, five large-scale expansion projects for hydropower plants are currently being promoted.⁸⁹ All this is in line with the political mandate given to the *Land*-owned company, which is formulated as follows:⁹⁰ with its subsidiaries, the company makes a significant contribution to regional value creation, is a driving force for the ecological transformation of the energy industry in Tyrol and thus supports the European and national energy targets. *TIWAG* generates environmentally friendly electricity from domestic, renewable energy sources in its existing and new power plants – in addition to hydropower, these also include photovoltaics and biomass. *TIWAG* also makes a significant contribution to climate protection with its many measures for the economic and efficient use of valuable energy. Similar approaches can also be found at the political level below the *Land*-level in the area of municipal utilities or energy supply companies owned by municipalities. Examples include *Innsbrucker Kommunalbetriebe AG*,⁹¹ *Stadtwerke Schwaz GmbH*⁹² and *Stadtwerke Kufstein GmbH*.⁹³

Not only Tyrol, but also Vorarlberg has committed itself to achieving energy autonomy by 2050.⁹⁴ The following milestones characterize the targeted development:⁹⁵

84 <https://www.tiwag.at/privat/strom/stromprodukte/>.

85 <https://www.tiwag.at/photovoltaik/produkte/>.

86 <https://www.tiwag.at/privat/zusatzleistungen/foerderungen/>.

87 <https://www.tigas.at/produkte/>.

88 <https://www.tiwag.at/privat/zusatzleistungen/energieberatung/>.

89 <https://www.tiwag.at/unternehmen/unsere-kraftwerke/unsere-ausbauvorhaben/>.

90 See <https://www.tiwag.at/unternehmen/>.

91 See <https://www.ikb.at/> menu item “*Energie*”.

92 See <https://stadtwerkeschwaz.at/> menu items “*Strom*” and “*Photovoltaik*”.

93 See <https://www.stwk.at/>.

94 See <https://www.energieautonomievorarlberg.at/zooluwebsite/media/document/3817/Strategie+Energieautonomie%2B+2030>.

95 See *Arbeitsprogramm 2019 – 2024*, <https://vorarlberg.at/documents/302033/472082/Arbeitsprogramm+2019++2024.pdf/42363506-5c70-d126-c847-d72c13a6e0c3?t=1616150574042> from page 24.

- i. Climate protection through 40% lower GHGs by 2030 compared to 2005.
- ii. The amount of RES for electricity, space heating and water heating is to be consistently expanded. By 2030, this should amount to at least 50% of the total final energy demand.
- iii. The achievement of a level of 100% RES in the power supply from 2030. In the “*Energieautonomie + 2030*” strategy, twenty-six fields of action with corresponding action areas were defined, whereby, unlike for Tyrol, no concrete energy mix is specified. Key Performance Indicators (KPI) were defined for these fields of action in order to measure the progress of goal achievement. The approach in Vorarlberg is broader since the strategy also addresses issues outside the pure energy sector (such as transport, waste management or agriculture and forestry), thus offering a compelling example of CPI.⁹⁶

Like Tyrol, Vorarlberg has already taken concrete steps to implement the strategy and has enacted comprehensive measures in its *Land* legislation, especially in the area of energy-efficient construction.⁹⁷ Alongside energy efficiency measures in the building sector, this results in approaches to avoid the use of fossil fuels in the area of energy supply for buildings.

In addition to the initial steps taken at the legislative level, the *Land* also adopted and implemented comprehensive subsidy programs to stimulate private investment in climate-friendly forms of energy (solar systems, heat pumps and biomass).⁹⁸ Moreover, the *Land* Vorarlberg has established the “*Vorarlberger Energieinstitut*” (Energy Institute), a non-profit association that unites essential stakeholders in the field of energy management in Vorarlberg. Its task is to advise, educate and carry out research in the fields of sensible energy use and RES.

As in Tyrol, the *Land*-owned energy company *illwerke vkw AG* also plays an important role in the energy policy integration of climate change mitigation

96 See <https://www.vn.at/2021/05/StrategieEA2030.pdf>.

97 See only the Ordinance of the *Landesregierung* on the technical requirements of structures (StF LGBL 2012/84) and the measures taken therein. On the other hand, the *Vorarlberger Elektrizitätswirtschaftsgesetz* (StF: LGBL 2003/59) should not be misleading with regard to the scope for shaping the energy sector under.

Land-law, as it is less a completely independent law and more an implementing act for the *Elektrizitätswirtschafts- und -organisationsgesetz 2010* of the *Bund* (StF: BGBL I 2010/110).

98 https://vorarlberg.at/-/energiefoederungsrichtlinie-2018-20-1?article_id=154851 as well as <https://vorarlberg.at/-/foederungsrichtlinien-der-abteilung-wohnbaufoederung>. See also https://vorarlberg.at/documents/302033/472360/2021_Informationenblatt_Biomasse_und_Abw%C3%A4rmenutzung_-_Grobstudien.pdf/f96ae891-2bfb-b532-b80c-8d4b5637a5a8?t=1619068538052.

measures in Vorarlberg. Private and corporate customers as well as public institutions at the *Land* and municipal level are offered products in the areas of electricity,⁹⁹ gas¹⁰⁰ and energy consulting,¹⁰¹ in order to provide every consumer with easy access to such offers.

Overall, the boundaries between the *Bund* and *Land* governments in the field of energy are very clear, despite many overlaps. The scope of action of the *Länder* is thus clearly circumscribed and the relevant actors move within their range of possibilities.¹⁰² Most of the measures shown, which deal with climate change in Tyrol and Vorarlberg in the areas discussed here, were therefore not of a legal, but rather of a sub-normative nature (this is a level under statutory law, i.e. non-binding acts), although the legislator (though not strictly in terms of energy [economic] law, but mostly in the field of building regulations) has taken selective initiatives, which can stimulate measures to combat climate change. However, the core of efforts in this regard at the provincial level is the subsidy regime¹⁰³ as well as entrepreneurial activity in the energy sector within the framework of private-sector administration.

3.3 *Water (Vorarlberg and Tyrol)*

Austrian water management is primarily characterized by a legislative (but also an executive)¹⁰⁴ competence of the *Bund*. A primary objective of water management is, in particular, the secure and sustainable supply of the population with high-quality, natural groundwater and drinking water. In order to be able to guarantee the qualitative and quantitative drinking and process water resources also for future generations, the necessary legal framework conditions have been created in Austria at the *Bund* level by means of the *Wasserrechtsgesetz* (WRG) 1959 (Law relating to water)¹⁰⁵ and the *Trinkwasserverordnung* (Drinking Water Ordinance),¹⁰⁶ which additionally

99 In addition to the offer of 100% electricity generated from sustainable energy sources in Vorarlberg, above all the implementation of photovoltaic projects including the corresponding subsidy processing.

100 <https://www.vkw.at/erdgas-privat.htm>.

101 <https://www.vkw.at/energiespartipps-privat.htm>.

102 See also IntT_02.

103 See also IntV_01; IntV_02 and IntV_06.

104 Note that in Austria the execution of laws is a task of the *Bund*, even if it takes place within the indirect federal administration ("*mittelbare Bundesverwaltung*"); see A. Kahl and K. Weber, *Allgemeines Verwaltungsrecht* (facultas 2019), margin No. 298, which means execution by the *Landeshauptmann* and his subordinated authorities, who are bound by the decrees and instructions of the supreme federal authorities.

105 StF: BGBl 1959/215 (wv).

106 StF: BGBl II 2001/304.

implement the EU Water Framework Directive 2000/60/EC as well as the EU Groundwater Directive as of the year 2000.

Accordingly, three fields of action determine water management:

- i. Protection of water bodies: The protection of all water bodies is one of the key objectives of water management. This applies to surface waters such as streams, rivers and lakes as well as to groundwater. The protection goal is defined very specifically in the WRG.¹⁰⁷
- ii. Sustainable use of water bodies: Water management defines the limits for the use of water to ensure long-term sustainable use. Withdrawals of water for water supply, private or business purposes, discharges of wastewater, withdrawals for the use of hydropower or the use of the thermal capacity of the water need defined limits in order to protect the water bodies and to ensure long-term usage. Uses of water bodies or installations in the stream bed must not be detrimental to the chemical and ecological status. Uses may only influence each other to the extent that their respective purpose is achieved.
- iii. Protection against water hazards: Floods are one of the greatest natural hazards in Alpine regions. Structural measures are to be taken to improve protection against floods. In the catchment area of torrents,¹⁰⁸ mudflow processes are also taken into account. Particularly in the case of extreme runoff events caused by climate change with intensive bed-load transport processes or mudflows, solid material management is necessary to protect settlement and traffic areas as well as hydropower plants.

Climate change is reflected in the context of the topic of water at the national level in two main ways. On the one hand, there is a close connection in the area of the energy turnaround already described, for which hydropower-based

¹⁰⁷ For surface waters, good ecological status and good chemical status are defined as targets; for groundwater good quantitative status and good chemical status. For heavily impaired waters, the target is good ecological potential. At the same time, a general "prohibition of deterioration" also applies, i.e., the current status may not be deteriorated. Exceptions to this require a comprehensive weighing of interests by the responsible authority.

¹⁰⁸ When it comes to water it is also necessary to mention the "*Wildbachverbauung*" (Torrent Control) which is sole competence of the *Bund* in legislation and execution. The Torrent (and Avalanche) Control authority is a subordinate agency of the "*Bundesministerium für Landwirtschaft, Regionen und Tourismus*" (Federal Ministry on Agriculture, Regions and Tourism). As a state organization, the Torrent Control aims at sustainable protection against natural hazards in the area of torrents, avalanches and erosion. Seven sections of the Torrent Control as well as 21 area construction managements are responsible for regional coordination and supervision of all services in the *Länder*.

energy generation plays a key role, but on the other hand, there are also questions about the consequences of climate change (such as increasing flood events and the like). In addition to this, there are measures to ensure the condition of water bodies as a result of changing conditions with regard to rising temperatures.

Specific legislation explicitly addressing the consequences of climate change on water (and or their prevention) is not discernible. Admittedly, there are comprehensive *Land* regulations in the context of nature conservation law¹⁰⁹ (which falls within the regulatory competence of the *Land* legislature) and wastewater disposal,¹¹⁰ which are of no further significance in the context to be discussed here. For the sake of completeness, the Vorarlberg law on public water supply by the municipalities in Vorarlberg (*Gesetz über die öffentliche Wasserversorgung durch die Gemeinden in Vorarlberg*)¹¹¹ should also be mentioned, which also pursues the goal of sustainably securing drinking water reserves.

However, the focus of this study is primarily on legal regulations resulting from the consequences of climate change, such as spatial planning¹¹² and building law¹¹³ with regard to flood areas or in the area of properties exposed to avalanches and torrents, especially since climate change increasingly causes such extreme events.

Parallel to this, the creation of a scientific basis (groundwork) is also important at the *Land* level. In order to collect the relevant data, comprehensive studies have been initiated in the field of hydrology to survey and secure strategic water resources that may be affected by climate change.¹¹⁴ In Vorarlberg, further developments are also defined in the *Wasserwirtschaftsstrategie 2025* (Water Management Strategy).¹¹⁵

At the interface between energy and water policies, Tyrol (in view of the already identified great importance of private parties and private-sector

109 See *Tiroler Naturschutzgesetz* (StF: LGBL 2005/26) or the *Gesetz über Naturschutz und Landschaftsentwicklung in Vorarlberg* (StF: LGBL 1997/22).

110 See the *Tiroler Kanalisationsgesetz* 2000 (StF: LGBL 2001/1) as well as the *Vorarlberger Kanalisationsgesetz* (StF: LGBL 1989/5).

111 StF: LGBL 1999/3.

112 See Chapter 6 in this volume.

113 See only section 3 para. 2 *Tiroler Bauordnung* 2018 and section 4 para. 4 *Vorarlberger Baugesetz* (StF: LGBL 2001/52).

114 See <https://www.ressourcenmanagement.tirol/projekte/wasser/strategische-wasserresourcen/>.

115 See <https://vorarlberg.at/documents/302033/472735/Wasserwirtschaftsstrategie+2025.pdf/44666b8c-f900-554d-cf2e-c7aa1e249863>.

administration in the field of climate change mitigation in the policy areas to be studied here) has also created a catalogue of criteria for the implementation of hydropower, which has been identified as essential for climate change mitigation.¹¹⁶ On a regional or strategic level, this serves as support for the site assessment to identify the most suitable areas or stretches of water (i.e., to answer the question: Where should integrative hydropower plants be built?). On a local or site-specific level, it serves as orientation for the assessment of concrete projects in the project planning and project appraisal phase (i.e., to answer the question: How must projects be designed in order to have the highest possible chance of approval in a transparent weighing of interests and taking ecological requirements into account?).

Finally, there are also comprehensive measures in the field of water management within the framework of subsidy or private sector management. In addition to the creation of appropriate hazard-avoiding structures, the aim is above all to secure the water supply in urban areas and for agriculture in a sustainable and lasting manner (also in the event of the occurrence of climate change-induced extreme weather events such as dry spells).

Thus, in Tyrol, the renaturation of (flowing) waters and the creation or expansion of retention areas as well as the reduction of water consumption in the municipal area are comprehensively promoted in the area of climate change adaptation.¹¹⁷ In addition, there are climate change adaptation measures for rainwater storage and the associated potential for savings in the area of drinking water, especially since extreme weather phenomena, such as dry spells in particular, will be accompanied by an increasing demand for drinking and service water.¹¹⁸ In Vorarlberg, too, there are comprehensive funding opportunities in the field of residential water management¹¹⁹ as well as protective hydraulic engineering and for renaturation.¹²⁰

Finally, also the role of the Bund in the field of executing the laws set by the Bund has to be mentioned, as it has far-reaching powers even concerning the enforcement of laws by the *Land* authorities. Within the indirect federal

116 See https://www.tirol.gv.at/fileadmin/themen/umwelt/wasser/Kriterienkatalog_Wasserkraft/downloads/Kriterienkatalog_Version-07-04-2011_3.o.pdf.

117 See the relevant subsidies matrix: https://www.tirol.gv.at/fileadmin/themen/landesentwicklung/raumordnung/Nachhaltigkeit/Nachhaltigkeits_und_Klimakoordination/Nachhaltige_Entwicklung/Foerdermatrix.pdf.

118 See <https://www.tirol.gv.at/meldungen/meldung/klimawandelanpassung-regenwasser-nutzen-trinkwasser-sparen-kanale-entlasten/>.

119 See only <https://vorarlberg.at/-/viid-siedlungswasserwirtschaft-landesfoerderung>.

120 See further <https://vorarlberg.at/-/viid-schutzwasserbau-und-renaturierungen-landesfoerderung>.

administration (“*mittelbare Bundesverwaltung*”), the *Landeshauptmann* and his subordinated authorities are bound by the decrees and instructions of the supreme federal authorities. Therefore, the federal ministry can provide the *Landeshauptmann* and the office of the *Land* government (as the competent institutions to act in the indirect federal administration) with instructions.

Overall, the demarcation lines between *Bund* and *Land* in the field of water management prove to be clear, with the *Länder* having only limited legal room for maneuver. Therefore, the most important measures that deal with climate change in Tyrol and Vorarlberg in the areas discussed here were not of a legal but mainly of a sub-normative nature, although the legislature has taken selective initiatives (mostly in the field of building codes) that can stimulate measures to combat climate change. The core of efforts in this regard at the *Land* level, however, is the subsidy regime within the framework of private-sector administration.

4 Conclusions

Energy and water are two very tightly interrelated sectors in both Italian and Austrian Autonomous Provinces analyzed in this chapter. Bolzano, Trento, Vorarlberg and Tyrol have integrated climate change concerns and objectives into their respective provincial policies and regulations with regard to the reduction of GHG emissions through the rational use and development of energy. In the policies of the four cases analyzed, we found that ambitious energy objectives are set for 2030 and 2050, with hydropower being a relevant source of renewable energy. However, in both cases there is a law and policy gap in the sector of water, whereas climate change concerns do not appear sufficiently integrated.

In Bolzano and Trento, the research has evidenced that water is a resource of utmost importance, whose availability is going to be impacted both by climate change and by competing uses, including the production of “green” electricity. This chapter has demonstrated that there are trade-offs among uses and perhaps the administration is not taking these conflicts over water use into sufficient account. While this topic should deserve specific attention and could be better addressed in future research, it gives us an idea on how water, climate change and renewable energy are closely interrelated and interdependent, paving the way for future consideration on how fair water and energy management should consider such aspects as part of a same holistic policy and significant example of CPI.

As far as Austria is concerned, the research has outlined that the points of contact under competence law for the implementation and enforcement of measures to combat climate change in Tyrol and Vorarlberg are limited. However, there are far-reaching opportunities for the *Länder* to act (apart from selective regulatory powers, e.g., in building law), especially in the field of private sector administration by means of *Land*-owned companies or subsidy administration. Moreover, Austrian *Länder* seem more advanced in terms of climate change adaptation compared to the Italian Autonomous Provinces. Ultimately, *Länder* have powerful options at their disposal for effectively countering climate change in their areas of political responsibility. In the light of limited legislative (and executive) powers, the political programs enacted and presented thus have a significance that goes beyond the content of purely programmatic announcements.

In conclusion, this chapter has demonstrated that both the Autonomous Provinces in Italy and the *Länder* in Austria under consideration have significant maneuvering space in terms of climate adaptation and mitigation policies, especially in the field of energy. This aspect is important, as it demonstrates how climate change instruments are applied at the local level starting from European directives, which sets a general framework of action. Even though some obstacles still persist in both countries, the chapter has evidenced how local initiatives are paramount in applying international and national climate policies.

Spatial Planning

Friederike Bundschuh-Rieseneder, Maria Tischler and Esther Happacher

1 Introduction¹

Spatial planning serves the orderly development and safeguarding of territories to ensure the sustainable use of a habitat,² which is clearly significantly influenced by climate change. Therefore, spatial planning measures play a central role in coping with the impacts of climate change.³ More generally, the issue of climate change can be addressed by embedding it as a general and cross-cutting principle into spatial planning instruments and by taking it into account in the individual policy areas of spatial planning. Among the policy sectors, the limitation of land consumption, the prevention of natural disasters, and measures in the building sector⁴ are essential areas in which climate change should be taken into account, as well as the area of mobility.⁵ In this context, spatial planning tools can aim to mitigate and contain the effects of climate change while improving climate change policy integration (CPI).⁶ The

1 Sections 2.1, 3.1, 3.2, 3.3, 4.1 and 4.2 are authored by Friederike Bundschuh-Rieseneder, sections 2.2., 3.4., 3.5., 4.3. and 4.4. by Maria Tischler; section 1 by Esther Happacher; section 5 by all three authors.

2 For the definition in the legal system in Austria see G. Lienbacher, "Raumordnungsrecht", in S. Bachmann *et al.* (eds.), *Besonderes Verwaltungsrecht* (Österreich Verlag 2020), 509–544, at 517ff; for Italy see F. Salvia and C. Bevilacqua, *Manuale di diritto urbanistico* (Wolter Kluwer 2017), at 22–25.

3 See A. Van Buuren *et al.*, "Towards Adaptive Spatial Planning for Climate Change: Balancing Between Robustness and Flexibility", *Journal for European Environmental and Planning Law*, 10 (2013) 26–50, at 31.

4 For Austria see ÖROK (ed.), *ÖROK-Empfehlung Nr. 56: Flächensparen, Flächenmanagement & Aktive Bodenpolitik* (Vienna 2017); among many see W. Kleewein, "Instrumente der Raumordnung – Überblick und Ausblick", *baurechtliche blätter:bbl*, 3 (2014) 89–106. For Italy, see M. Munafò (ed.), "Consumo di suolo dinamiche territoriali e servizi ecosistemici", *Report SNPA 22/21*, (2021); among many E. Boscolo, "La pianificazione generale", in M.A. Cabiddu (ed.), *Diritto del governo del territorio* (Giappichelli 2020) 97–128, at 112–128.

5 On the topic of mobility, see Chapter 4 in this volume.

6 See S. Kruse and M. Pütz, "Adaptive Capacities of Spatial Planning in the Context of Climate Change in the European Alps", *European Planning Studies*, 22 (2014) 2620–2638 and especially at 2626ff.

prerequisite for this is that spatial planning instruments are adapted to the challenges of climate change both at the normative level and in their implementation. Depending on the constitutional provisions, spatial planning is allocated to different territorial levels in the constitutional system with varying responsibilities and competences. In this chapter, we will first therefore set out the constitutional frameworks in the regions studied – the *Länder* Vorarlberg and Tyrol for Austria, and the Autonomous Provinces of Bolzano-Bozen and Trento for Italy. Subsequently, the main spatial planning tools at the legal, strategic and political levels are illustrated. At the same time, the paper will investigate to what extent climate change and measures to deal with its effects are already incorporated into spatial planning in these subnational areas. The conclusions will show to what degrees there are similar or different approaches to climate change issues in the four regions studied, and what answers have so far been given to the cross-cutting challenges of climate change.

2 The Varying Scope for Action on Spatial Planning in a Constitutional Perspective

2.1 *Vorarlberg and Tyrol*

The Austrian Federal Constitution does not provide a separate competence for “spatial planning law”. According to article 15(1) Federal Constitutional Law,⁷ spatial planning is to be regulated by the *Länder*, such as Vorarlberg and Tyrol, unless a separate federal government competence exists. For example, the federal government has spatial planning competences in individual legal bases such as order of land use in connection with railways and roads, forestry law or water law. The *Länder* have spatial planning competences in areas such as building law or nature conservation law. For this reason, spatial planning law is fundamentally to be classified as a cross-cutting issue.⁸

Local spatial planning is explicitly anchored in article 118(3) No. 9 Federal Constitutional Law as a requirement belonging to the municipality’s own exclusive sphere of action. This guarantees that municipal bodies can proceed independently in local spatial planning, which is primarily concerned with zoning plans and development plans. Local spatial planning is only under the supervisory control of the *Länder*. This control is expressed in rights of

⁷ *Bundes-Verfassungsgesetz* – B-VG StF: BGBl. No. 1/1930.

⁸ See decision of the Constitutional Court VfSlg 2674/1954 qualifying spatial planning law as a complex cross-sectional matter.

approval or annulment with regard to municipal planning acts,⁹ but only with regard to their legality, not the appropriateness of the municipality's actions.¹⁰

In principle, cooperation and coordination between the federal government and the *Länder* is necessary for sensible spatial planning. Contracts under article 15a Federal Constitutional Law between the federal government and the *Länder* provide an essential instrument for this, which has long been in frequent use. The Austrian Conference on Spatial Planning¹¹ is another coordination instrument, founded in 1971. It has a purely advisory character for all spatial planning authorities in Austria and prepares recommendations for relevant activities of the federal government, the *Länder* and the municipalities every 10 years.¹²

2.2 *Autonomous Provinces of Bolzano-Bozen and Trento*

According to article 8 No. 5 of the Statute of Autonomy¹³ (hereinafter Statute), the Autonomous Provinces of Bolzano-Bozen and Trento wield legislative power in the field of spatial planning. In exercising these powers, they have to comply with the Constitution, the principles of the legal system of the Republic, the international obligations and the law of the EU, as well as with the fundamental provisions of economic-social reforms embedded in State laws. In addition, provincial spatial planning competence is subject to restrictions by State laws in the field of procedural provisions that are considered an expression of fundamental norms to guarantee the exercise of civil and social rights,¹⁴ or as an expression of the exclusive State legislative power in the area of environmental protection, such as the Strategic Environment Assessment (hereinafter SEA) and Environmental Impact Assessment (hereinafter EIA).¹⁵ Moreover, the cross-cutting nature of spatial planning leads to the restriction of Provincial competencies in spatial planning policy by legislative acts of the

9 Art 119a B-VG.

10 See among others G. Lienbacher, "Raumordnungsrecht", *supra*, at 519.

11 *Österreichische Raumordnungskonferenz – ÖROK*.

12 I. Rath-Kathrein, "Raumordnungsrecht", in P. Bußjäger and T. Müller (eds.), *Besonderes Verwaltungsrecht* (Studia 2020) 1–24, at 2–3. Further R. Klaushofer, "Raumordnungsrecht", in E. Pürgy (ed.), *Das Recht der Länder* (Sramek 2012) 827–865, at 834–842.

13 DPR 670/1972 (OJ 59/1978, ord. suppl. 59).

14 Art. 117(2)(m) Italian Constitution; Corte cost. 203/2012, para. 9 and Corte cost. 121/2014, para. 6.

15 Art. 117(2)(s) Italian Constitution; Corte cost. 93/2019, para. 3.1, 198/2018, paras. 13.3 and 18. 8.

EU in areas such as energy, environmental protection or transport policy,¹⁶ in particular in terms of sustainability.¹⁷

The scope of Provincial legislative powers is specified by implementing regulation DPR 381/1974.¹⁸ In principle the Provinces are free to define their own spatial planning systems by providing spatial planning instruments for the provincial and local level. However, to guarantee the respect of interests that belong to the State, e.g. of a military nature,¹⁹ coordination with the central level is necessary. At the same time, the State has to establish a consensus with the Provinces in its own areas of competence, such as railway lines, highways,²⁰ airports or tasks for disaster prevention,²¹ in order to respect provincial spatial planning interests.²²

DPR 381/1974 has recently been supplemented by two implementing regulations, which appear to be of significant relevance, concerning the governance of climate change issues with specific regard to urban redevelopment and structural rehabilitation. The first legislative decree (hereinafter D.lgs.) 146/2016²³ allows the autonomous Provinces to restrict or prohibit commercial activities in commercial zones in line with the principles of proportionality and non-discrimination.²⁴ In addition, within the limit of the legal framework of the EU for state aid, commercial activities may be supported and promoted by (financial) measures aimed at preserving traditional forms of settlement such as small villages, thus preventing on the one hand rural exodus, and on the other hand an unstructured sprawling of commercial activities due to the principle of total liberalisation characterizing the national legal framework. According to the second implementing regulation D.lgs. 9/2018,²⁵ the autonomous Provinces can define urban standards, i.e., determine the relationship

16 M. Kment, "Europäische Raumentwicklung – Kompetenzen der Europäischen Union und Perspektiven", in S. Lorenzmeier and H.P. Folz (eds.), *Recht und Realität. Festschrift für Christoph Vedder* (Nomos 2017) 207–222, at 221.

17 M. Rizzo and M. Fontana, "Energia, Clima ed economia circolare nella disciplina dell'attività edilizia (e pianificatoria)", in M.A. Cabiddu (ed.), *Diritto del governo del territorio* (Giappichelli 2020) 265–291, at 270–273.

18 OJ 62/1979, ord. suppl.

19 Art. 21(1), Art. 22 and Art. 23 DPR 381/1974.

20 DPR 320/1997 and Corte cost. 313/2001, para. 7.

21 Art. 19(1)(a)-(e) and (g) DPR 381/1974.

22 Corte cost. 768/1988, para. 3.2, 2/1996, para. 3, 180/1989, para. 2, 286/1985, para. 9–10, 21/1991, para. 3, 6/1993, para. 3.

23 OJ 178 /2016.

24 Corte cost. 187/2018 (ordinance) and 9/2018, para. 3 and 201/2018, para. 4. CJEU 30 January 2018, joined cases C-360/15 e C-31/16, X BV and Visser Vastgoed Beleggingen, EU:C:2018:44.

25 OJ 39/2018.

between public and private areas, as well as the distances between and the density and height of buildings. However, the real efficiency of this implementing regulation, especially regarding the distances between buildings, can only be assessed once relevant case law is available.

In addition, provincial legislative powers in areas such as landscape, energy or transport can generate a positive effect on spatial planning competence.²⁶ This is due to the fact that spatial planning as a general issue encompasses all these profiles and is therefore conditioned by them.²⁷

With specific regard to administrative powers, the local level takes on the main role, according to the constitutional principle of municipal autonomy.²⁸ The municipalities have exclusive planning sovereignty for their territory,²⁹ which they exercise by using the spatial planning tools defined by State and Provincial provisions and guidelines.

3 Legal Framework and Implementing Regulations

3.1 *General Reflections on the Austrian Länder Vorarlberg and Tyrol*

The legal definitions in the provisions of the spatial planning laws of the individual *Länder* differ, but refer to similar objectives. Therefore, spatial planning can be defined as the forward-looking, planned shaping of living space for its best possible use and safeguarding in the interest of the community. In any case, the natural conditions and the assessable economic, social and cultural needs of the population must be considered.³⁰

The spatial planning laws of the *Länder* distinguish between local and supra-local spatial planning. Local spatial planning refers to the respective municipal area and is implemented by the municipalities within their own

26 W. Obwexer, "Energie und Konzessionsvergabe", in W. Obwexer *et al.* (eds.), *EU-Mitgliedschaft und Südtirols Autonomie. Die Auswirkungen der EU-Mitgliedschaft auf die Autonomie des Landes Südtirol am Beispiel ausgewählter Gesetzgebungs- und Verwaltungskompetenzen Handbuch* (Verlag Österreich 2015) 257–290; M. Alberton and F. Cittadino, "Umweltschutz", in *Ibid.*, 438–478; A. Eisendle, "Verkehr", in W. Obwexer *et al.* (eds.), *EU-Mitgliedschaft und Südtirols Autonomie II* (Verlag Österreich 2019) 356–380.

27 Corte cost. 182/2006, para. 2.2, 327/1990, para. 4 and 379/1994, para. 5.2. v. Cerulli Irelli, "Pianificazione urbanistica e interessi differenziati", *Rivista trimestrale di diritto pubblico*, 2 (1985) 386–443.

28 Corte cost. 83/1997, para. 4.

29 Corte cost. 378/2000, para. 4, 303/2003, para. 2.1 and 179/2019, para. 12.3.

30 I. Rath-Kathrein, "Raumordnungsrecht", *supra*, at 4. Further R. Klaushofer, "Raumordnungsrecht", in E. Pürgy (ed.), *Das Recht der Länder* (Sramek 2012) 827–865, at 832.

sphere of action. Among other things, the municipalities issue zoning plans as ordinances, in which the various types of use are bindingly defined for all land areas of a municipality. Furthermore, development plans are established that relate to the details of building on land areas³¹ that are intended for development.

Supra-local spatial planning relates to the respective national territory and is the responsibility of the *Länder*, which issues spatial development programs or *Land* spatial development plans by ordinance. The planning acts of supra-local spatial planning are superordinate to those of local spatial planning; accordingly, the municipalities must consider the specifications of supra-local spatial planning.³²

3.2 *Vorarlberg*

The legal basis for spatial planning in Vorarlberg is the Act on Spatial Planning.³³ Although it does not explicitly mention climate change, references can be found. Thus, § 11(1)(f) stipulates that the spatial development plan shall contain fundamental statements on the intended settlement development; in particular, settlement focal points, densification zones, open spaces for local recreation as well as the structure of the building areas including the chronological sequence of development are to be considered, taking into account the requirements of infrastructure, protection against natural hazards, climate change and energy efficiency. Furthermore, this legal regulation contains indirect references to protection against climate change, such as securing open spaces for protection against natural hazards³⁴ or energy supply, which must take special account of the sustainable use of renewable energy.³⁵ Citizen participation is also essential and must be adequately guaranteed in the preparation of the spatial development plan. This is an important tool in relation to climate change, as it allows citizens to contribute ideas and suggestions that can be incorporated into draft development plans. In line with this, Vorarlberg established a participatory tool named “*Bürgerrat*”, by which approximately 10 to 15 persons selected by sortition are involved in deliberative processes on specific topics and develop solutions and collective recommendations, presented subsequently in citizen-café, to be evaluated by policymakers, who,

31 For example, the total height of the buildings is specified or whether a terraced housing development may be built.

32 G. Lienbacher, “Raumordnungsrecht”, *supra*, at 520.

33 *Gesetz über die Raumplanung* StF: LGBl. No. 39/1996.

34 § 11(1)(e).

35 § 11(1)(j).

in turn, are expected to provide feedback within the framework of so-called resonance groups.³⁶

3.3 Tyrol

Based on article 41 of the Tyrolean Provincial Code 1989,³⁷ the Tyrolean Spatial Planning Act 2011 was re-published as the Tyrolean Spatial Planning Act 2016,³⁸ including various amendments. This law distinguishes between supra-local and local spatial planning. Both areas of regulation contain indirect references to climate change.

§ 1 of the Spatial Planning Act 2016 regulates the tasks and objectives of supra-local spatial planning. This includes safeguarding habitats, especially settlement areas and important transport routes, from natural hazards, with particular attention paid to the effects of climate change.³⁹ Furthermore, it includes attention to securing energy supplies, especially through the efficient use of energy, and working towards an energy supply that is as independent as possible and meets the requirements of environmental and climate protection, while making increased use of domestic renewable energy sources.⁴⁰ § 2 regulates the principles to be observed in the implementation of the tasks and objectives. These principles refer to the natural foundations of life, which must be used sparingly. They have to be cared for and preserved as far as possible. They must not be used or burdened in such a way that they are no longer available to future generations in sufficient quantity and quality. Consideration must be given to cross-border interconnections and interdependencies within and between *Länder*, while safeguarding the interests of the population.

The tasks and objectives of local spatial planning are to be implemented in harmony with the objectives and principles of supra-local spatial planning.⁴¹ Insofar as planning within the framework of local spatial planning has effects beyond the boundaries of the municipality, coordination with other affected municipalities is mandatory in accordance with the relevant circumstances with regard to the objectives and principles of supra-local spatial planning, municipalities also coordinate with each other. In addition, the local spatial planning interests of neighboring municipalities, in particular in the area of

36 <https://vorarlberg.at/-/b%C3%BCrgerrat-klima-zukunft>. See also 4.1 Strategy and Policy Documents Vorarlberg.

37 *Tiroler Landesordnung 1989* StF: LGBL. Nr. 61/1988.

38 *Tiroler Raumordnungsgesetz 2016* – TROG StF: LGBL. Nr. 101/2016.

39 § 1(2)(d) TROG.

40 § 1(2)(l) No. 3 TROG.

41 § 27 TROG.

common borders, must also be considered. There are more than 15 tasks and goals enshrined in § 27, such as the conservation of contiguous forest areas, taking into account their suitability with regard to the effects of the forest or the conservation of particularly valuable areas in terms of their ecology and the preservation of natural or near-natural landscape elements and parts of the landscape worthy of preservation. These tasks and goals are expressly defined by the Tyrolean legislator and are directly related to climate change.

3.4 *Autonomous Province of Bolzano-Bozen*

Although the Spatial Planning law 9/2018⁴² does not mention climate change among its general objectives, it is the main reference at the legislative level.⁴³ According to its preparatory guidelines,⁴⁴ the law aims in general at sustainable spatial development by defining the fundamental aims of protection of naturally limited resources, and preventing urban sprawl.⁴⁵ The law itself addresses climate change indirectly through its principles aimed at the reduction of land use and energy consumption, the rehabilitation of buildings, the use of sustainable energy, and the protection and prevention of natural hazards.⁴⁶

The reduction of land use is specifically provided for by article 17 L.P. 9/2018. According to the general rule, land use is only permitted in the settlement area; outside the settlement area it is allowed only in exceptional cases provided for by law, which has to be interpreted in a restrictive manner.⁴⁷ This means there is no ecologically or economically appropriate alternative for land use outside the settlement area, be it through the conversion or rehabilitation of existing buildings, or by expropriation.⁴⁸

Measures in the field of urban redevelopment and structural rehabilitation are also linked to the reduction of land use.⁴⁹ The aim of these is to guarantee a high quality of life in urban areas to prevent further urban sprawl, hence the importance of fixing appropriate urban standards.⁵⁰ The relevant implementing regulations repeatedly emphasize the importance of preserving open and

42 OJ Reg. 28/2018, suppl. 3.

43 See N. Bertuzzi *et al.* (eds.), *Interview Report Bolzano, Trento, Vorarlberg and Tyrol* (2021), at 8. The entire Chapter 1 (art. 17–21) of Title III L.P. 9/2018 concerns the sustainable development of space.

44 DGP 869/2015.

45 Appendix of DGP 869/2015, at 14–23.

46 Art. 2(m), (i) and (d) L.P. 9/2018; see N. Bertuzzi *et al.* (eds.), *Interview Report, supra*, at 8.

47 Administrative Court of Bolzano 128/2021.

48 Art. 17(2) L.P. 9/2018. Administrative Court of Bolzano 128/2021.

49 Art. 17(6)(a)–(c) L.P. 9/2018 and DPP 31/2018.

50 Arts. 18 and 21(1) and 2 L.P. 9/2018.

green spaces in urban areas due to their ecological functions and their positive effects on the climate conditions in settlement areas.⁵¹ Therefore, at municipal level a soil sealing index indicating the maximum percentage of the site area that can be sealed has to be defined.⁵² Moreover, in case of new land uses through the dedication of building land, the L.P. 9/2018 provides a compensation mechanism, which obliges the municipality to levy the planning added value.⁵³

The zoning category of mixed-use aims to concentrate various activities within residential areas, which should contribute to reducing traffic volume.⁵⁴ To achieve a higher level of sustainability in the building sector, various measures are envisaged to increase the energy efficiency of existing and future building stock.⁵⁵ Moreover, L.P. 9/2018 facilitates the localization of renewable energies, for which specific zoning is necessary only in certain cases.⁵⁶

In the field of mitigation and prevention of natural hazards, L.P. 9/2018, provides the hazard zone map as an obligatory planning instrument according to Directive 2012/18/EU.⁵⁷ For the purpose of climate change adaptation, these maps aim to prevent damage by considering natural risks at the planning stage, and developing a certain awareness in the population regarding the issue.⁵⁸

Finally, it has to be mentioned that environmental aspects are generally taken into account in the preparation of spatial planning instruments by means of SEAS and EIAs.⁵⁹

3.5 *Autonomous Province of Trento*

Similarly to the Autonomous Province of Bolzano-Bozen, the Spatial Planning law 15/2015⁶⁰ of the Autonomous Province of Trento does not mention climate change explicitly among its principles. Nevertheless, it addresses the issue by aiming at sustainable spatial development through the valorization and

51 Especially art. 4(6)-(8) and art. 10 DPP 17/2020, art. 7 DPP 31/2018.

52 Art. 52(4)(f) L.P. 9/2018 and DPP 24/2020.

53 Art. 19 L.P. 9/2018.

54 Arts. 22 and 24 L.P. 9/2018, art. 4 DPP 17/2020 and DGP 9/2018.

55 Art. 21(3)(c) L.P. 9/2018, DPP 16/2020, DGP. 301/2021 and 235/2020; see IntBZ_01.

56 Art. 29(3) L.P. 9/2018 and art. 2 DPP 13/2020.

57 Art. 41(e) L.P. 9/2018; Directive 2012/18/EU of the European Parliament and of the Council of 4 July 2012 on the control of major-accident hazards involving dangerous substances, amending and subsequently repealing Council Directive 96/82/EC Text with EEA relevance (OJ L 197/1, 24 July 2012).

58 <https://pericoli-naturali.provincia.bz.it/de/gefahrenzonenplan-gzp>. All internet sources in this chapter were accessed on 6 April 2022.

59 L.P. 17/2017 (OJ 42/2017, suppl. 3).

60 OJ Reg. 32/2015.

limitation of the use of natural resources, with specific reference to the reduction of land use and the valorization of the landscape.⁶¹ All spatial planning instruments are based on these principles,⁶² i.e. the Provincial Urban Plan⁶³ (hereinafter PUP), the Territorial Plan of the Community⁶⁴ (hereinafter PTC) and the land use plan⁶⁵ (hereinafter PRG).

The reduction of land use is primarily addressed by the reuse and rehabilitation of buildings and settled urban areas, which aims to increase the quality of urban living.⁶⁶ The use of undeveloped land is only foreseen as *ultima ratio* if no alternatives are available.⁶⁷

Incentives are provided for existing buildings and their structural, architectural or energy rehabilitation, for instance by increasing the construction volume or by compensation mechanisms, such as the recognition of the right to build in the form of credits.⁶⁸ For historic buildings in remote mountain areas, special refurbishment incentives using innovative technologies are provided for.⁶⁹ Moreover, a fund for the promotion of redevelopment measures has been set up.⁷⁰ In addition, the sustainability of construction activities should be increased by enhancing the energy efficiency of buildings or through the use of sustainable building materials.⁷¹ For this purpose, incentive mechanisms, such as the reduction of the building levy or an increase in usable net space are provided for.⁷² Furthermore, in order to ensure the effectiveness of the implementation of urban rehabilitation measures, owners whose properties do not comply with the provisions of the municipal spatial planning instruments can also be subject to expropriation.⁷³

61 Art. 2(1)(a)-(b) and (g) L.P. 15/2015; see N. Bertuzzi *et al.* (eds.), *Interview Report, supra*, at 34.

62 Art. 17(5) and arts. 21, 23, 24 L.P. 15/2015.

63 Translation of *Piano urbanistico provinciale*.

64 Translation of *Piano territoriale della comunità*.

65 Translation of *Piano regolatore generale*.

66 Arts. 18(1)(a)-(d) and 18(2); Arts. 108–111 L.P. 15/2015 are dedicated to urban and building rehabilitation.

67 Art. 18(1)(e)-(f) L.P. 15/2015.

68 Art. 27 and art. 110(3) L.P. 15/2015; Arts. 58–62 DPP 8–61/Leg.2017.

69 Art. 37 L.P. 4/2010 (regional OJ 9/2010).

70 Art. 72 L.P. 15/2015.

71 Arts. 81–91 L.P. 1/2008 and art. 23 DPP 8–61/Leg. 2017; DPP 11–13/Leg. 2009.

72 DGP 2091/2021.

73 Art. 57 L.P. 15/2015.

Finally, it has to be stressed that environmental aspects are generally taken into account in the procedure of spatial planning instruments due to European instruments such as SEAS and EIAs.⁷⁴

4 Strategy and Policy Documents

4.1 *Vorarlberg*

With reference to the legal regulations set out above, Vorarlberg has set itself major goals with regard to climate change. The first spatial planning strategy of Vorarlberg was established in 2019 and named “Spatial Vision Vorarlberg 2030”.⁷⁵ For several years now the *Land* of Vorarlberg has also paid greater attention to overall spatial planning concepts in the form of a holistic, conceptual and strategic handling of spatially relevant issues. With Spatial Vision Vorarlberg 2030, spatially relevant topics are now covered more comprehensively, and active planning and the possibilities of planning on a cross-municipality level will be used more intensively. Therefore, Vorarlberg has established a strategic framework for policy and administrative actions as well as for coordination between the different territorial levels.

The “Energy Autonomy 2050 program”⁷⁶ appears very ambitious. The goal of this project is to provide the same amount of energy from renewable sources as will be needed in Vorarlberg in 2050. The focus lies on the four pillars of energy autonomy as follows: energy saving, energy efficiency, renewable energy and research, development and education. In order to achieve these goals, citizen participation is seen as an essential element, especially regarding education. Besides awareness-raising initiatives organized in schools, it is generally difficult to reach younger individuals under thirty years of age. Therefore, efforts to reach this target group involve advertising and communication campaigns on social media such as Facebook and Instagram.

Furthermore, the Climate Adaptation Strategy 2015 includes sectoral measures and the yearly climate adaptation plans with their sectoral actions. Also relevant in terms of spatial planning law is the amendment of the Spatial Planning Act 2019,⁷⁷ pursuant to which development plans for

74 Art. 20 L.P. 15/2015.

75 “*Raumbild 2030*”, available at <https://vorarlberg.at/documents/302033/473174/Raumbild+Vorarlberg+2030+-+Intentionen+und+Entstehungsprozess.pdf/8f55170b-d3b5-1090-0248-30fafa3c5a>.

76 <https://www.energieautonomie-vorarlberg.at/de/>.

77 LGBl. No. 4/2019.

municipalities became mandatory and will need to be approved by 31 December 2022.⁷⁸

4.2 Tyrol

With reference to the above remarks on the Tyrolean legal framework, the year 2005 could be described as the milestone in sectoral climate change integration in Tyrol. This is due to the 2005 amendment of the Tyrolean Spatial Planning Act of 1994 – which has been re-enacted several times and is now in force as the Tyrolean Spatial Planning Act 2016 – which integrated open-space reservations in the planning concept and required municipalities to adapt local spatial planning concepts accordingly.

Other projects in Tyrol that relate to climate change are the Tyrolean Spatial Development Strategy “*ZukunftsRaum Tirol 2011*” and “*LebensRaum Tirol – Agenda 2030*”. “*ZukunftsRaum Tirol 2011*” was decided by the state government on 27 September 2011 and is a spatial development plan pursuant to the § 12 Tyrolean Spatial Planning Act 2016. The spatial development plan is divided into four main parts: Part 1 provides a succinct analysis of the current situation and current and future challenges for the spatial development of the *Land*. Part 2 contains the basic principles, goals and strategies. Part 3 selects from the large number of measures proposed in the participation process those that are to be implemented in the short term. Part 4 describes the activities envisaged for the overall implementation and further development of the *ZukunftsRaum Tirol*, including the selection procedure for further measures. The project has since been evaluated and updated.

The “*LebensRaum Tirol – Agenda 2030*” which was adopted on 2 April 2019 is currently being implemented. The spatial development plan is divided into five parts: The important ones are Part 1, which contains the initial situation and challenges for five thematic fields, as well as strategies derived from these for the future orientation of spatial planning. Current topics are examined in more detail under the title “In Focus”. In Part 2, objectives and recommendations for action for the further spatial development of the State are concisely summarized. These form the core of the spatial development plan *LebensRaum Tirol – Agenda 2030*. Part 3 describes guidelines for the overall implementation of the *LebensRaum Tirol – Agenda 2030* and the further development of this document. Part 4 includes the glossary of the most important technical terms and Part 5 lists the programs, plans and strategies of the *Land*, the federal government and the EU that are relevant for spatial planning in Tyrol.

⁷⁸ See N. Bertuzzi *et al.* (eds.), *Interview Report, supra*, at 74–75.

These tools, proposed in the “*LebensRaum Tirol – Agenda 2030*” are planning instruments that are not legally binding but self-binding for the administration, and represent a point of reference for new zonings and in argumentation with municipalities.⁷⁹

4.3 *Autonomous Province of Bolzano-Bozen*

At the level of spatial planning instruments, the Development and Spatial Planning Plan of the Province (hereinafter LEROP)⁸⁰ is hierarchically the highest spatial planning instrument at provincial level, and all other spatial planning instruments have to comply with it. The LEROP focuses on sustainable spatial development, the protection of the ecological system and the avoidance of urban sprawl; ecological interests prevail if it is impossible to balance them with economic interests.⁸¹ In 2023 the LEROP will be replaced by the Strategic Provincial Plan,⁸² which will take into account the climate change issue by interlinking with the climate plan as the main reference document.⁸³

The other central spatial planning instrument is the Municipal Development Program,⁸⁴ which in consideration of the zoning categories according to article 22 L.P. 9/2018 defines the settlement area.⁸⁵ In this way, it assigns the key role for reducing land use to the single municipalities. However, the discretion of the municipality in the elaboration process is conditioned by the statement of the Provincial Commission for spatial planning and landscape and the approval of the final program by the Government of the Province. Furthermore, citizens have to be involved in elaborating the plan. A joint elaboration of the program by multiple municipalities is supported through financial facilitation.⁸⁶

The implementation of measures for urban redevelopment and the rehabilitation of the building fabric is to be ensured by means of corresponding

79 See <https://www.tirol.gv.at/landesentwicklung/raumordnung/ueberoertliche-raumordnung/raumordnungsplan-lebensraum-tirol-agenda-2030-1/>. Further N. Bertuzzi *et al.* (eds.), *Interview Report, supra*, at 54.

80 Translation of *Landesentwicklungs-und Raumordnungsplan/Piano provinciale di sviluppo e coordinamento territoriale*. Approved by L.P. 3/1995 (OJ No. 5 of 31 January 1995). See IntBZ_01.

81 LEROP, 125–131.

82 Arts. 43–44, L.P. 9/2018; Translation of *Landesstrategieplan/piano strategico provinciale*.

83 See IntBZ_01.

84 Translation of *Gemeindeentwicklungsprogramm/programma di sviluppo comunale per il territorio e il paesaggio*.

85 Art. 2 DPP 31/2018.

86 Arts. 51 and 53 L.P. 9/2018, DPP 31/2018 and DGP 741/2021.

implementation plans, whereby cooperation with private subjects is also possible through spatial planning agreements.⁸⁷

The municipality also bears the main responsibility for drawing up hazard zone plans. Hazard zone plans prevail in case of contradictions with the land use plan to ensure that their requirements are taken into account.⁸⁸

In addition to the aforementioned legal requirements, due to their far-reaching planning sovereignty, municipalities can also address the climate problem via autonomous initiatives. For instance, the city of Bolzano-Bozen has introduced a soil-sealing index⁸⁹ that obliges part of the buildable area to be kept free of impermeable ground coverings.⁹⁰ Furthermore, the city has improved social housing in an environmentally friendly way by participating in the Sinfonia Smart city project⁹¹ through energy-efficient renovation.

Finally, it has to be underlined that sectoral planning instruments, such as the Provincial Landscape Plan,⁹² local landscape plans, or the Stelvio National Park Plan take precedence over other spatial planning instruments.⁹³ Therefore, landscape issues frequently condition how climate issues are taken into account.

4.4 *Autonomous Province of Trento*

The main point of reference in the Autonomous Province of Trento is the PUP,⁹⁴ which is the spatial planning instrument at provincial level with specific landscape significance⁹⁵ that all other spatial planning instruments must comply with. Its objective is to ensure sustainable development through the valorization of natural resources, as well as contributing to an increase in competitiveness and territorial cohesion at provincial level.⁹⁶ Therefore, the focus lies on the protection of the landscape, which is intended as the living space of the population and the expression of territorial identity, and thus includes

87 Arts. 59 and 20 L.P. 9/2018.

88 Arts. 52 and 55 L.P. 9/2018 and DPP 23/2019.

89 https://opencity.gemeinde.bozen.it/Buergerportal/Beschraenkungindex-der-versiegelten-Flaechen-B.v.F#accedere_al_servizio.

90 *Klimareport* (Eurac Research 2018), at 87, <https://webassets.eurac.edu/31538/1618826782-klimareport-2018-de.pdf>.

91 <http://www.sinfonia-smartcities.eu/de/>. See N. Bertuzzi *et al.* (eds.), *Interview Report, supra*, at 8.

92 Art. 45 L.P. 9/2018.

93 See N. Bertuzzi *et al.* (eds.), *Interview Report, supra*, at 8.

94 Art. 21 L.P. 15/2015; see IntTN_02 and IntTN_09.

95 According to Art. 135 D.lgs. 42/2004 (OJ 45/2004).

96 Arts. 1 and 7(4) PUP.

both the natural and the cultural landscape in accordance with the European Landscape Convention. In this regard, the Map of the Landscape,⁹⁷ specified by provisions of the PTC and PRG as a component of the PUP, analyzes the landscape, establishes criteria for its valorization, and directs the other spatial planning instruments towards sustainable development of the territory.⁹⁸ The PUP also establishes environmental protection assets and areas that have to be considered by other spatial planning instruments. Furthermore, the PUP provides a compensation mechanism for interventions permitted in exceptional cases on “agricultural land of special importance”.⁹⁹ Therefore, land with a different land-use designation has to be made available to an extent of 80% of the reduced agricultural resource.¹⁰⁰ In addition, the Summary Map of Territorial Hazards¹⁰¹ is an integral part of the PUP that serves as a unified tool for hazard assessment in land use planning and is continuously updated.¹⁰²

The PTC, as the intermediate spatial planning instrument for the provincial and municipal level, specifies the contents of the PUP. It analyzes the supra-municipal area in terms of natural resources and settlement stock and thus serves as a basis for reclamation and reuse measures as well as the reduction of land use.¹⁰³

At the municipal level, the spatial planning instrument of the PRG defines the developed settlement areas and those zones that require reclamation or redevelopment measures. In accordance with the principle of limiting land consumption, new settlement areas may only be designated in the PRG if there are no alternative possibilities.¹⁰⁴

In general, the municipalities seem to be aware of the need to ensure the sustainable development of the territory by upgrading settlement structures and the landscape in order to reduce land consumption and increase quality of life.¹⁰⁵ However, relevant initiatives to this end have so far been limited to isolated cases.¹⁰⁶

97 Translation of *Carta del paesaggio*.

98 Art. 9 PUP, Art. 23(2)(c) L.P. 15/2015.

99 Art. 8(2)(e) PUP and art. 3(1)(k) L.P. 15/2015.

100 Art. 38(7) PUP and art. 112(8) L.P. 15/2015; see N. Bertuzzi *et al.* (eds.), *Interview Report, supra*, at 34.

101 Arts. 14–18 PUP.

102 See IntTN_02 and IntTN_09.

103 Art. 23 L.P. 15/2015, Art. 5(2) and Art. 30(2) PUP.

104 Arts. 24(2)(b)-(c) and 24(5) L.P. 15/2015.

105 *Agenda Comuni 2030*, https://agenda2030.provincia.tn.it/content/download/8302/152870/file/Agenda%20Comuni%202030_Documento%20divulgativo_ottobre2021_.pdf.

106 <https://agenda2030.provincia.tn.it/Buone-Pratiche/Scopri-tutte-le-buone-pratiche>.

5 Conclusions

Despite necessary coordination with the central level, in areas that have an impact on the climate-friendly orientation of spatial planning and are of competence or interest for the Federation in Austria or the State in Italy, the *Länder* and Autonomous Provinces have wide scope for legislative action in the field of spatial planning. Thus, they can address climate-relevant issues in terms of mitigation and adaptation by means of spatial planning. However, when comparing the four spatial planning laws – which are the main reference in all four regions analysed in this chapter – only one explicit mention of “climate change” appeared, and this is in connection with protection against natural disasters in the Tyrolean law. Nevertheless, all spatial planning laws indirectly take climate change into account, especially by defining the sustainable use of land as a natural resource, the avoidance of urban sprawl, the consideration of natural hazards, the achievement of energy efficiency and a focus on renewable energies as objectives. In addition, for the Autonomous Provinces of Bolzano-Bozen and Trento the concept of urban redevelopment and structural rehabilitation, which is closely linked to the principle of reducing land consumption, can be mentioned. This is due to the fact that in the Italian legal system spatial planning law also includes building regulations. Furthermore, in Italy and in Austria mechanisms address the actions of private actors by encouraging them to take measures that address climate change issues, for example by increasing the usable net space in cases of the reuse of existing buildings or by discouraging new land consumption by imposing compensatory measures.

Objectives that tackle climate change in an indirect way are reflected in the various planning systems. First and foremost, in all four of the regions studied, instruments and documents of a strategic nature that address climate change can be found. They are geared towards sustainable development in the sense of the aforementioned objectives enshrined in the spatial planning laws and are linked to energy or climate programs, such as the Spatial Vision Vorarlberg 2030, or the Strategic Provincial Plan of the Autonomous Province of Bolzano-Bozen. The presence of such objectives linked to energy programs might also suggest the potential role of the spatial planning sector to create a fruitful correlation with the energy sector for a better CPI. However, the main responsibility for the concrete design and implementation of these aims lies with the municipality. This far-reaching responsibility corresponds to the planning sovereignty or municipal autonomy enshrined at constitutional level.

With special consideration of the climate-relevant policy areas, climate change is addressed through several measures. Among them, we find the containment of land consumption in conjunction with the prevention of urban

sprawl and the definition or non-expansion of settlement boundaries by means of planning instruments of the municipality, e.g. in Tyrol and Vorarlberg through strategic local spatial development concepts or in the Autonomous Province of Bolzano-Bozen through the Municipal Development Program. At the same time, it has to be stressed that in the Autonomous Province of Trento the issue is considered not only at the level of the municipality, but already at a level intermediate to the Autonomous Province and the municipality.

Adaptation to climate change by considering the effects of natural hazards is taken into account through the preparation of hazard zone plans at the provincial or municipal level, or through the direct designation of areas at risk from natural hazards in the zoning plan.

In summary, it can be stated that both the spatial planning laws and the planning instruments at the level of the *Länder* and the Autonomous Provinces take climate-relevant issues into account. However, they do not consider them from a cross-cutting perspective, but focus mainly on sectoral profiles. Moreover, effective implementation is usually the responsibility of the municipality. In addition, the objectives defined by the higher-level planning instruments are not always transposed into the concrete zoning actions at municipal level, thereby raising the question of the appropriateness of this level for pursuing the effective adaptation to and mitigation of climate change related effects. For example, in Tyrol, the previously mentioned situation – i.e. the failure of municipalities to adequately reflect the higher-level objectives, has led to the need for reorganization.¹⁰⁷ Moreover, awareness at the community level of the importance of implementing the objectives of planning, which take into account climate change, has to be strengthened. In this context, the involvement of people living in the area concerned by the process of developing strategic planning documents is crucial. Participatory processes offer opportunities to contribute ideas and suggestions for sustainable development through spatial planning, as provided for example through the “*Bürgerrat*” in Vorarlberg. At the same time, a general tendency towards inter-municipal cooperation is noted. Finally, the development of spatial planning instruments is being steered in a sustainable direction by a more general growing awareness among the population and by movements such as “Fridays for Future” for protection against climate change, which influence the actions of decision-makers.¹⁰⁸

107 See IntT_03.

108 See N. Bertuzzi *et al.* (eds.), *Interview Report, supra*, at 18–20, 62, 70, 80 and 87.

PART 3

*Facilitating Climate Change Integration
in Subnational Governments
Analysis of the Institutional Factors*



Coordination and Leadership

Niccolò Bertuzzi, Peter Bußjäger and Alice Meier

1 Introduction and Contextualization¹

The following chapter introduces the analysis of the single dimensions (or institutional factors) that are theorized to be the possible drivers for climate change policy integration (CPI) at the subnational level.² In this contribution we discuss two of the targeted dimensions hence focusing on coordination (horizontal and vertical) and leadership both in theory and in practice.

Coordination is often considered a synonym of integration, implying a one-dimensional vision of policy-making as exclusively based on the effective cooperation between the various organs of an administration and on a fruitful, multi-level political collaboration. As discussed in the Introduction to the book, we reject such a simplistic definition of integration, but at the same time still consider the role of coordination as crucial for CPI.

A common element stands behind both vertical and horizontal coordination: the increasing complexity of policy issues and policy-making activity.³ A considerable amount of literature agrees on the need for polycentric governance, definable as “a non-hierarchical set of interactions between public and private actors operating at multiple levels (e.g., supranational, national, and subnational) without a predominant central authority”.⁴ Climate change does not represent an exception as it requires coordination between actors at different levels of decision-making (vertical coordination) and, within each level, between different departments and stakeholders (horizontal coordination).⁵ This is true for both mitigation and adaptation, based on the awareness that

1 In the joint elaboration of this chapter, sections 2.1, 2.2 and 3.1 have been written by Peter Bußjäger, sections 2.3.1 by Alice Meier, section 2.3.2 by Niccolò Bertuzzi, section 3.2 jointly by Alice Meier and Niccolò Bertuzzi, and sections 1 and 4 by all three authors.

2 For an overview of the theorized dimension of CPI see the Introduction in this volume.

3 W. Lafferty, and E. Hovden, “Environmental Policy Integration: Towards an Analytical Framework”, *Environmental politics*, 12 (2003) 1–22; R. Keohane and D. Victor, “The Regime Complex for Climate Change”, *Perspectives on politics*, 9 (2011) 7–23.

4 T. Morrison *et al.*, “Mitigation and Adaptation in Polycentric Systems: Sources of Power in the Pursuit of Collective Goals”, *Wiley Interdisciplinary Reviews: Climate Change*, 8 (2017) 1–16.

5 R. Keohane and D. Victor, “The Regime Complex”, *supra*.

no single policy sector alone can win the challenges represented by climate change.⁶ Moreover, the effectiveness of climate governance, beyond the constitutional allocation of competences, may be greatly affected by the procedures and mechanisms that operationalize coordination in practice.

The other dimension analyzed in this chapter, leadership, closely connects with coordination and concerns the extent to which there is a clear impetus for CPI from politicians or top-level managers in administrations. In the field of climate policy, not only complexity but also a constant uncertainty is at stake.⁷ Thus, leadership should be analyzed from a longitudinal perspective, as policy advances are made of incremental steps;⁸ further, even while adopting in this research an institutional perspective, the symbolic dimension of leadership should be acknowledged, as not always self-representations of leaders and their claimed initiatives correspond to an effective improvement in obtained results.⁹ The evolution of leadership has been significant in the study of the political sphere, even beyond the role assumed by party politics.¹⁰ This was also due to the “turn” represented by so-called new public management¹¹ in the 1980s and 1990s. The idea behind this paradigm was to “reinvent government”,¹² through a more effective and efficient policy-making process, considering citizens as customers and using private sector’s management tools. This determined significative changes for both the administrative and political leadership, implying for example the identification of managerial figures, the creation of dedicated agencies, the attention to cost cutting and to the simultaneous improvement of performance. All these aspects still maintain centrality in policy-making, and they remain crucial also in the analyses of those authors

6 J. Candel and R. Biesbroek, “Toward a Processual Understanding of Policy Integration”, *Policy Sciences*, 49 (2016) 211–231.

7 J. Gupta *et al.*, “The Adaptive Capacity Wheel: A Method to Assess the Inherent Characteristics of Institutions to Enable the Adaptive Capacity of Society”, *Environmental Science & Policy*, 13(6) (2010) 459–471.

8 M. Mintrom and J. Luetjens, “Policy Entrepreneurs and Problem Framing: The Case of Climate Change”, *Environment and Planning C: Politics and Space*, 35 (2017) 1362–1377.

9 W.W. Powell and P.J. DiMaggio (eds.), *The New Institutionalism in Organizational Analysis* (University of Chicago Press 1991); J. March and J. Olsen, “The New Institutionalism: Organizational Factors in Political Life”, *American Political Science Review*, 78 (1983) 734–749; R. Bates, “Contra Contractarianism: Some Reflections on the New Institutionalism”, *Politics & Society*, 16 (1988) 387–401.

10 F. Musella, *Political Leaders Beyond Party Politics* (Palgrave 2018).

11 C. Hood, “A Public Management for all Seasons?”, *Public Administration*, 69 (1991) 3–19.

12 T. Osborne and D. Gaebler, *Reinventing Government: How the Entrepreneurial Spirit Is Transforming the Public Sector* (Beacon Press 1992).

who have criticized the new public management model,¹³ and even for those who have theorized different governmental models.¹⁴

The chapter seeks to identify the pitfalls and the elements of success of these dimensions of CPI – coordination and leadership – as well as their interplay. Two main sections (2 and 3.) are dedicated to discussing each dimension singly, and are further subdivided as follows: the introductory subsections (2.1 and 2.2; 3.1) offer a description of the legal and theoretical framework based on relevant literature and primary sources; successively the empirical analysis of the collected material (interviews and documents gathered during the desk research) will follow (2.3; 3.2). Finally, a conclusive section (4) summarizes the main findings.

2 Coordination towards Integration of Climate Change Policy

Currently, no specific institutions have been introduced into the formal coordination framework of either country for the purpose of discussing climate change issues. Matters of climate protection are primarily dealt with within the general institutions for coordination and cooperation of the two states, as reconstructed in the following subsections.

2.1 *The Coordination Framework in Italy*

2.1.1 General Remarks

The Italian Constitution does not establish a federation in the traditional sense. Nonetheless the Italian “regional state” recognizes and promotes local autonomies as a fundamental constitutional principle in article 5 and constitutionally entrenches decentralization, by dividing in article 117 legislative powers¹⁵ between the central state and the twenty regions, five of these with a special statute, including the region South Tyrol – Trentino (pursuant to article 116(1)). The latter consists of the autonomous provinces of Bolzano and Trento.

13 T. Christensen and P. Læg Reid, “Regulatory Agencies—The Challenges of Balancing Agency Autonomy and Political Control”, *Governance*, 20 (2007) 499–520; J. J. Bryson, B. C. Crosby and L. Bloomberg, “Public Value Governance: Moving Beyond Traditional Public Administration and the New Public Management”, *Public Administration Review*, 74 (2014) 445–456.

14 B. Wirtz and S. Birkmeyer, “Open Government: Origin, Development, and Conceptual Perspectives”, *International Journal of Public Administration*, 38(5) (2015) 381–396.

15 For a detailed reconstruction of the constitutional allocation of competences in Italy, also in respect of the project relevant sectors, see Chapter 3 in this volume.

The Italian Constitution originally lacked mechanisms of coordination and cooperation between levels of government, as autonomy was conceived only as operating within the limits of clearly defined competences and functions that should be “parallel” to national legislation and administration.¹⁶ Moreover, the fact that the Second Chamber of Parliament, the Senate, does not operate as an organ of representation of regional instances, requires further coordination efforts between different institutional levels.

The rulings of the Italian Constitutional Court inspired the evolution of a principle of “loyal cooperation”, which is now provided for by article 120 of the Constitution since the constitutional reform of 2001.¹⁷ Nevertheless, there are still no formal institutions of cooperation and coordination between the levels of government entrenched in the Constitution.

However, institutional cooperation among levels of government led to the establishment of a wide range of bodies that bring together national, regional and local government. Such a network is commonly known as the “system of conferences”, consisting of the permanent State-Regions (including autonomous provinces) Conference (*Conferenza Stato e Regioni*), the State-Municipalities-Local Autonomies Conference (*Conferenza Stato-Città ed Autonomie Locali*) and, finally, the State-Regions-Autonomous Provinces-Municipalities-Local Autonomies Conference, also known as “Unified Conference” (*Conferenza Unificata*).¹⁸

2.1.2 The State-Regions Conference

The permanent conference for relations between the state, regions and autonomous provinces was established in 1983 and is regulated by article 12 of L. 400/1988 (as complemented by D.lgs. 281/1997). This organ, which represents a permanent body holding regular sessions, exercises information and consultative functions on general political questions, as far as they affect regional competences.¹⁹ Such competence includes for example advisory opinions on government acts of regional interest, or appointments to bodies carrying

16 E. Ceccherini, “Intergovernmental Relationships in Italy a Feeble but Useful Model” in E. Arban, G. Martinico and F. Palermo (eds.), *Federalism and Constitutional Law: The Italian Contribution to Comparative Regionalism* (Routledge 2021) 65–81, at 66.

17 *Ibid.*, at 68; J. Woelk, “Loyal Cooperation Systemic Principle of Italy’s Regionalism?” in E. Arban et al. (eds.), *Federalism and Constitutional Law*, *supra*, at 170.

18 E. Ceccherini, “Intergovernmental Relationships in Italy”, *supra*, at 69.

19 F. Palermo and J. Woelk, “Die Ständige Konferenz von Staat, Regionen und autonomen Provinzen in Italien”, in A. Rosner and P. Bußjäger (eds.), *Im Dienste Der Länder – Im Interesse des Gesamtstaates: Festschrift 60 Jahre Verbindungsstelle Der Bundesländer* (Braumüller 2011) 731–755, at 731.

out activities or services relevant to the exercise of concurrent competence between state, regions and autonomous provinces.

The conference is chaired by the prime minister and is composed of the presidents of regions and of the autonomous provinces. Depending on the subject under discussion, the competent national and regional ministers may attend the conference.

2.1.3 The State-Municipalities-Local Autonomies Conference

To foster local autonomies, D.lgs. 281/1997 included a provision for the creation of a State-Municipalities-Local Autonomies Conference. Article 9 of the Decree states that such conference has the duty to coordinate the relations between the state and local autonomies in order to study, inform and exchange opinions concerning problems connected with the general political direction. The conference is the seat for discussion and analysis of problems concerning the local level and functioning of legislative initiative of the government.²⁰

2.1.4 Other Conferences

Law-Decree 281/1997 also provides for the creation of a Unified Conference (State-Regions-Autonomous Provinces-Municipalities-Local Autonomies Conference). According to article 9, the unified Conference adopts deliberations, makes agreements, gives advice and appoints representatives for matters and tasks of joint interest of regions, provinces, municipalities and mountain communities. Other institutions are the State-Cities and Local Autonomies Conference in regional legislation concerning local functions. Finally, the various conferences of services (platforms in which local administrations can participate) represent an administrative tool to collect “accords”, “concerts”, “permissions” or “named approvals” of other administrations involved in complex decision making.

Among the several concertation tools that have been introduced by the legislature, the most relevant²¹ are:

- “the planning conference”, *i.e.* a participatory body introduced by a number of regional acts.
- “planning agreements” between institutional subjects with competences in a specific sector.

²⁰ E. Ceccherini, “Intergovernmental Relationships in Italy”, *supra*, at 70.

²¹ For a detailed description of the mentioned mechanisms see *Ibid.*, at 74–75.

- “planning contracts” stipulated between the public administration and private entities.
- “program agreements” used to frame integrated and coordinated action by different administration organs, both local and national.

2.1.5 Joint Commissions²²

A specific mechanism of coordination is furthermore available for the Autonomous Provinces of Trento and Bolzano, in light of their particular status of autonomy enshrined in the Constitution (article 116). The Autonomous Provinces may adopt specific implementing norms (*norme di attuazione*)²³ enacting the special forms of autonomy that are at the core of their Autonomy Statute.²⁴ These norms, pursuant to article 107 of the Autonomy Statute, are adopted by two joint commissions (*commissioni paritetiche*), composed by an equal number of representatives of both the State and the Autonomous Provinces, namely the commission of twelve (*Commissione dei dodici*) for general implementing norms and the commission of six (*Commissione dei sei*) for the implementing norms concerning the policy fields that fall within the competences of the Province of Bolzano. According to the Italian Constitutional Court, the joint commissions are a special coordination body between the State and the autonomous regions, including the Autonomous Provinces.²⁵ The latter have made large use of this mechanism of cooperation, by adopting a series of implementing norms also in the field of environmental protection, energy, transport and spatial planning.²⁶

22 This subsection was written by Federica Cittadino.

23 These are adopted in the form of legislative decrees (D.lgs.) but have a special constitutional status, in that they cannot be repealed by ordinary laws. See F. Palermo, “Ruolo e natura delle commissioni paritetiche e delle norme di attuazione”, in J. Marko, S. Ortino and F. Palermo (eds.), *L'ordinamento speciale della Provincia Autonoma di Bolzano* (Cedam 2001) 832–836; G. Postal, “Le norme di attuazione statutaria”, in M. Marcantoni, G. Postal and R. Toniatti (eds.), *Quarant'anni di autonomia. Le istituzioni e la funzione legislativa* (Franco Angeli 2011) 102–163; P. Giangaspero, “I decreti di attuazione degli Statuti speciali”, in R. Bin and L. Coen (eds.), *I nodi tecnici della revisione degli Statuti speciali* (I.S.G.Re 2008) 107–123; R. Chieppa, “Le esperienze delle commissioni paritetiche e il valore delle norme di attuazione degli statuti speciali regionali”, *Le Regioni*, 6 (2008) 1051–1076.

24 DPR 670/1972.

25 *Corte Costituzionale*, dec. No. 109/1995.

26 See D.lgs. 9/2018, D.lgs. 146/2016 and 381/1974 on spatial and urban planning; D.lgs. 46/2016, D.lgs. 429/1995 and D.lgs. 527/1987 on transport and traffic regulation; D.lgs. 118/2003 and D.lgs. 463/1999 on hydroelectric concessions; D.lgs. 235/1977 on energy matters.

2.2 *The Coordination Framework in Austria*²⁷

2.2.1 General Remarks

Article 2 of the Federal Constitution (*Bundes-Verfassungsgesetz* B-VG) explicitly stipulates that Austria is a federal state, which consists of nine autonomous constituent units, the so-called *Länder*.²⁸

The constitutional distribution of competences in legislation and execution between the *Bund* and the *Länder* is entrenched in article 10–15 B-VG.²⁹ As for the relationship between different institutional levels, according to the jurisprudence of the Constitutional Court, the federal order as well as the *Länder* need to comply with the *Berücksichtigungsprinzip* (principle of mutual consideration), not explicitly provided for in the Federal Constitution but developed by the Court. This principle resembles the general principle of *Bundestreue* in Germany,³⁰ which implies that in exercising their authority, the *Länder* as well as the *Bund* are bound to respect their respective interests.

Austrian federalism is characterized by a high degree of entanglement between the *Länder* and the federal order, as well as by a certain subordination of the *Länder* towards the *Bund*. Several factors explain this fact: the complexity of the division of competences; the fact that *Land* governors are responsible for executing federal legislation and finally, the circumstance that the Conference of the *Land* Governors ("*Landeshauptleutekonferenz*"), which is explored in the following, fosters horizontal cooperation between all *Länder*. This cooperation is informal, voluntary, and consensus-based. Various vertical and horizontal cooperative instruments were introduced in the second half of last century (see below).

2.2.2 Article 15a B-VG Agreements

Formalized horizontal and vertical coordination, also on topics that directly or indirectly impact sectoral climate change integration, takes place via legally binding agreements between the *Bund* and the *Länder* or amongst the *Länder* on matters within their respective spheres of competence according to article 15a(1) and (2) B-VG. For example, *inter alia*, *Bund* and *Länder* concluded an

²⁷ For a detailed reconstruction of the coordination framework see P. Bußjäger, "Austria's Cooperative Federalism", in G. Bischof and F. Karlsrufer (eds.), *Austrian Federalism in Comparative Perspective* (The University of New Orleans Press 2015) 11–33.

²⁸ Namely Burgenland, Carinthia, Lower Austria, Upper Austria, Salzburg, Styria, Tyrol, Vorarlberg and Vienna (article 2(2) B-VG).

²⁹ For a detailed reconstruction of the constitutional allocation of competences in Austria, also in respect of the project relevant sectors, see Chapters 2 and 3 in this volume.

³⁰ See for example E. Arban, "Exploring the Principle of (Federal) Solidarity", *Review of Constitutional Studies/Revue d'études constitutionnelles*, 22(2) (2017) 241–260, at 242.

article 15a B-VG agreement on measures in the building sector, for the purpose of reducing greenhouse gas emissions in 2009 (BGBl. II No. 251/2009), then amended with further climate protection measures in 2017 (BGBl. II No. 213/2017). In this framework, the *Länder* notably undertake, within their sphere of influence, to engage their municipalities in the implementation of greening measures (article 14 of the agreement).

2.2.3 Conference of Land Governors

This horizontal mode of cooperation works as a relatively efficient counterbalance to the weight of the federal order of government. Indeed, despite a continuous process of centralization of legislative powers, the Conference of the Land Governors has developed into an important platform for the *Länder*, especially in the field of financial equalization and in negotiations concerning cost-sharing for the execution of federal law by the *Länder* and municipalities, to exercise political influence on the federal level. The lack of a formal legal status has no impact on the efficiency and output of the institution. Decisions of the Conference of Land Governors are taken unanimously. In theory, the unanimity requirement should be an obstacle to common action or positions, but in practice, decisions are rarely blocked by vetoes.

2.2.4 Other Conferences

There are numerous other institutions and thematic conferences and instruments of horizontal cooperation, in addition to the Conference of the Land Governors. At the political level, there are conferences of *Land* ministers according to the respective portfolio (e.g., for finances and social matters). At the technical-administrative level, there are conferences of the directors of the offices of the *Land* governments as well as experts' conferences of the *Länder* (which bring together administrative and technical experts in certain policy matters, such as environment and climate protection). All these institutions are purely informal, but represent a relevant exchange framework and function as concertative tools.

2.2.5 Liaison Office of the Austrian Länder and Other Platforms

The Liaison Office of the Austrian *Länder* is the most important institution for coordinating matters between all the *Länder*. The head office is situated in Vienna. Its main tasks are the organization of all the *Land* conferences discussed above, as well as submitting the viewpoints of the different *Länder* and the issuing of joint statements by the *Länder* towards the federal government. Vertical cooperation takes place in various expert groups composed of members of the administrative staffs of federal ministries and *Land*

governments. Several institutions are structured between the federal level, the *Länder* and the municipalities, which aim to facilitate coordination and cooperation. Vertical ones include for example, the Austrian Conference on Spatial Planning (ÖROK) and the Federal Crisis Management Conference. ÖROK is a joint organization of the Federal Government, the *Länder*, representatives of the Economic Chamber and Workers' Chamber, the League of the Austrian Cities and the League of the Austrian Municipalities. The conference provides recommendations and has no regulatory authority. Horizontal institutions include for example the Austrian Institute of Construction Engineering.

2.3 Frameworks, Instruments and Practices of Coordination

In the following subsections the analysis will go beyond the constitutional division of powers and the theoretical framework for coordination, as reconstructed above, and explore mechanisms of horizontal and vertical coordination in practice. The basis for the narrative is represented by the outputs of the empirical analysis conducted during the research.

2.3.1 Horizontal Coordination

The outputs of the empirical analysis evidenced that both Austrian *Länder* and the Italian autonomous provinces developed an institutional and policy framework to deal with climate change at subnational level. Moreover, mechanisms of horizontal coordination, involving different departments of the administration, peripheral agents³¹ or political representatives, are in place in all territories. In all case studies at least one umbrella policy³² outlines the subnational commitment to the fight against climate change and introduces a framework for horizontal coordination.

Additionally, policy-makers take separate steps to integrate climate objectives in their sectoral policies, also by liaising with actors from other sectors.³³

31 Herein peripheral agents are entities entrusted with tasks that are relevant for the implementation of climate actions, linked in different ways to the administration either directly, by means of public participation and or through controlling interests, or indirectly, by means of funding and financing.

32 For example, the provincial Strategy for Sustainable Development in Trento (*Strategia provinciale di Sviluppo Sostenibile – SproSS – Agenda 2030*); the update to the Climate Strategy in Bolzano (*PianoClima Energia – Alto Adige 2050*, as updated by *Piano clima Alto Adige 2040*); the newly published Climate and Sustainability Strategy in Tyrol (*Nachhaltigkeits- und Klimastrategie 2021*) and the Climate Change Adaptation Strategy in Vorarlberg (*Strategie zur Anpassung an den Klimawandel 2021*). For a detailed reconstruction of the climate policy in the selected case studies see Chapter 3 in this volume, section 3.

33 See Chapter 3 in this volume and Part 2 of the book. Moreover, during the interviews the respondents highlighted strong cross-sectoral synergies, e.g. between spatial planning

It should be stressed that the sectoral decision-makers maintain the ownership of their decision-processes. Hence, in the absence of binding sectoral targets or enforceability mechanisms, the integration of climate objectives ultimately occurs on a voluntary basis.

Despite organizational differences, all subnational governments clearly identify a leading coordinating institution. This entity is specifically entrusted with the task to facilitate interdepartmental exchange on climate questions. In Italy, the coordinating competences are attributed to provincial environmental agencies, governed by public law and established by the provincial administration.³⁴ We refer to the *Agenzia per l'Ambiente e la Tutela del Clima* in the Autonomous Province of Bolzano (APPA Bolzano), and the *Agenzia per la Protezione dell'Ambiente* in the Autonomous Province of Trento (APPA Trento). Diversely, in Austria the tasks are assigned to units within the organizational matrix of the administration. The latter are the Sustainability and Climate Protection Coordination unit³⁵ in Tyrol and the Energy and Climate Protection Division³⁶ in Vorarlberg. Moreover, in both *Länder* climate coordinators, administrative officers belonging to the aforementioned bodies and who hold specific coordinating responsibilities, were identified as key actors within the administration to support sectoral mainstreaming.³⁷ Despite the existence of coordinating units being positively evaluated, a few interviewees highlighted a twofold criticality of coordination in practice: *i*) the actual coordination happens in an intense bilateral exchange between the respective coordination units and the single departments, whereas direct exchange between the various departments is rather incidental and situational;³⁸ *ii*) the coordination units would be able to maintain an overview of the implementation but not however be able to concretely affect the implementation of the measures.³⁹

Generally, horizontal coordination within the administration at subnational level works on an informal basis, either in relation to established dependencies between departments, or otherwise is mostly limited to the strategic level,⁴⁰

and the energy and water sector (IntT_05) or spatial planning and the transport sector (IntBZ_10; IntV_05).

34 Organizational structures of the Provinces with organizational, administrative and accounting autonomy.

35 *Nachhaltigkeits-und Klimakoordination*, within the Department for Land Development (*Abteilung Landesentwicklung*).

36 *Fachbereich Energie und Klimaschutz* situated within the General Economic Affairs Department (*Abteilung Allgemeine Wirtschaftsangelegenheiten* Vla).

37 IntV_02; IntT_03.

38 IntT_03; IntV_05.

39 IntT_04; IntV_06.

40 IntT_03; IntV_02; IntBZ_01; IntTN_04.

meaning that the recurring instrument for horizontal mainstreaming is the cooperative formulation of strategic papers or of implementation reports.⁴¹ However, this cross-sectoral approach to policy-making, despite being beneficial for policy coherency,⁴² reportedly leads to a rather vague formulation of policies and, as a result, to a difficult coordination and monitoring of the implementation.⁴³

The empirical analysis further revealed the operativity of an interplay of both institutionalized and informal interdepartmental mechanisms. For example, the Autonomous Province of Trento institutionalizes climate related coordination by introducing specific permanent bodies, which function as a cooperative framework between different departments. The initial observatory body on climate issues (*Osservatorio Trentino sul Clima*) was subsequently replaced by a permanent coordination and action table on climate change (*Tavolo Provinciale di Coordinamento e di Azione sui Cambiamenti Climatici*), participated by a number of departments and chaired by the APPA Trento.⁴⁴ In the Province of Bolzano, L.P. 17/2017 introduces a permanent Environmental Committee. This committee is presided by the APPA Bolzano and composed of other sectoral experts appointed by the government upon designation of the departments and holds consultative functions on the environmental impact of public projects and programs of the Province.

In Tyrol, the new Climate and Sustainability Strategy 2021 introduces a two-tier complementary governance, providing for coordination between responsible departments and between the administration and political representatives. The core working group consists of the Climate Protection Coordination unit (see above), the Energy Coordination unit⁴⁵ and the heads of the relevant departments, whereas the steering committee is composed of political representatives (decision-makers) and the aforementioned core working

41 For instance, *inter alia*, the provincial Energetic and Environmental Plan in Trentino (*Piano Energetico Ambientale Provinciale – PEAP 2021*); the Energy Autonomy Strategy + 2021 (*Energieautonomie +*) in Vorarlberg and the spatial planning concept “*Zukunftsraum Tirol*” 2011. An example of horizontal coordination in the monitoring and evaluation phase is represented by the periodic progress reports on climate measures (*Tiroler Klimafortschrittsbericht*) by the Department for Land Development in Tyrol.

42 IntTN_04.

43 IntT_01.

44 IntTN_07.

45 The *Energiekoordination Tirol, Amt der Tiroler Landesregierung* is an *ad hoc* organizational unit introduced with the purpose of centralizing energy-related questions and topics. This is justified by the fact that the energy sector is quite cross-cutting, but also by the need to implement climate change integration in the sector.

group. This governance model, which was originally introduced for the policy-development phase, is intended to be maintained also in the implementation.⁴⁶ A similar mechanism was reported to operate in Vorarlberg within the framework of the energy autonomy program.⁴⁷

Moreover, intra-departmental coordination mechanisms are introduced to handle sectoral complexities, also with the mandate to enhance sectoral climate change mainstreaming. Examples include the Mobility Management Coordination Unit in Vorarlberg,⁴⁸ the Energy Coordination Unit in Tyrol⁴⁹ and the Green Mobility Initiative in the Autonomous Province of Bolzano.⁵⁰

Despite the evidence of a certain shared institutional concern for climate change across sectors and in all territories, some respondents highlighted that the administration would lack the necessary structure to concretely deal with an overlapping and cross-cutting issue such as climate change.⁵¹ Indeed, whilst each department, administrative structure and member of the subnational government (*assessore/Landesrat*) is normally concerned with certain clearly institutionalized tasks, inversely, climate change requires a coordinated approach and continuous exchange between policy-makers, going beyond institutionalized practices. This aforementioned structural unpreparedness seems to be linked to the process-innovation that climate change integration would in practice entail.⁵²

Further reported criticalities, linked to the structural deficit at issue, are understaffing in the administration and the underpinning budgetary question of the financing of additional resources.⁵³ In the two *Länder* the highlighted structural aspects lead to the systematic outsourcing of certain responsibilities in connection to climate change, especially with regard to education, communication, but also coordination, to peripheral entities linked in various ways to the administration.⁵⁴ As for the Autonomous Province of Trento, an

46 IntT_07.

47 IntV_05.

48 *Koordinationsstelle Mobilitätsmanagement, Amt der Vorarlberger Landesregierung.*

49 *Energiokoordination Tirol, Amt der Tiroler Landesregierung.*

50 <https://www.greenmobility.bz.it/it/>. All hyperlinks in this chapter were accessed on 17 March 2022.

51 IntBZ_02; IntV_06; IntT_01.

52 IntT_04; IntBZ_02.

53 IntT_02; IntV_05.

54 IntT_04; IntV_01. The Energy Institutes, non-administrative organizations, in both Tyrol and Vorarlberg count as major implementation agents for climate policies. This is reasonably due to the fact that in both *Länder*, the competencies for climate matters lie within the organizational matrix of the administration and selected responsibilities are outsourced.

improvement in horizontal coordination – also due to expense reduction – has been identified⁵⁵ leading to a clearer definition of roles and responsibilities, with the relevant tasks being concentrated with APPA Trento. Specifically, measures were taken to promote joint approaches and to avoid dispersed efforts, experienced in the past, related to the lack of coordination in the parallel actions by the responsible bodies and of a clear political strategy at provincial level.⁵⁶

Finally, cross-border cooperation should not be disregarded, when referring to horizontal coordination. During the interviews the following framework for inter-governmental and cross-border cooperation were mentioned: a) the EUSALP's macroregional European strategy for the Alpine region;⁵⁷ b) the Alpine Convention;⁵⁸ and d) the Euregio.⁵⁹ More specifically, in the case of the Euregio, the joint government program shows climate protection in mobility and energy among its key objectives. Some important initiatives are being developed, such as the Brenner Base Tunnel which, beyond the already mentioned EU support, is also based on cross-border cooperation between the concerned states and subnational governments. The Brenner motorway is a key element for tourism, mobility and the economy, with about two million trucks going back and forth along the motorway every year, resulting in heavy pollution of valleys. Furthermore, even more specific projects are supported by cross-border coordination: one example is Solar Tyrol, an inter-regional project on the mapping of solar potential in Tyrol and Bolzano to assess further actions for the use of renewable energy.⁶⁰

55 IntTN_01.

56 IntTN_05; IntTN_07.

57 EUSALP brings together many coordination bodies, which are participated by different agencies or institutions related to the subnational governments. As an example, in the case of the Province of Trento, *Agenzia Provinciale per le risorse idriche e l'energia* (APRIE – Provincial Agency for Water and Energy) is a member of the Action Group on energy, *Fondazione Mach* is a member of the one related to ecological networks, the Department of Civil Protection and APPA Trento form part of the group working on risks related to natural events.

58 The Alpine Convention (1995) is an international territorial treaty concluded between alpine Countries, amongst these also Italy and Austria. The Convention addresses climate change as a transversal topic with dedicated declarations (recently, see Innsbruck Declaration of 2019) and through a thematic working body, the Alpine Climate Board, which bundles climate actions in the framework of the Alpine Convention.

59 The Euregio is an European Grouping of territorial cooperation (EGTC) under European law which involves the two Autonomous Provinces of Trento and Bolzano in Italy and *Land Tyrol* in Austria.

60 <https://www.tirol.gv.at/statistik-budget/tiris/tiris-anwendungen/solar-tirol/>.

2.3.2 Vertical Coordination

The acknowledgment of the central role played by transnational governance and in particular by European directives in pushing climate policies at the subnational level is a shared result. No particular differences emerged among the different areas or policy sectors under investigation.

As specified in numerous interviews, the – more or less explicit – main goal of subnational governance is to contribute to reaching the objectives identified by the Paris Agreement⁶¹ and the UN Sustainable Development Goals.⁶² It is not by chance that in all the four cases examined, specific documents were produced to frame subnational (climate) policies and CPI within the sustainable development agenda. The Paris Agreement is perceived as a turning point;⁶³ however, also previous documents produced by transnational institutions were mentioned, such as the Fourth Report on “Climate Change 2007” by the Intergovernmental Panel on Climate Change (IPCC), which outlined a clear connection between climate change and human activity.

While the international level represents the frame of reference of intergovernmental and scientific cooperation, Europe acts as a reference for CPI. Specifically, the EU has been recognized as the entity able to effectively advance the fight against climate change by introducing binding targets both at the state and subnational level. Recurring EU reference emerged during various interviews, and especially in the collected documents. Considering Austria, 88% (same percentage in Tyrol and Vorarlberg) of the policy documents analyzed in both *Länder*, 71% of the sectoral legislation and 50% of the 15a agreements specifically refer to EU law.⁶⁴ Considering Italy, the total of documents mentioning European directives decreases to 71%. The percentage is almost the same in Trento and Bolzano considering the total amount of documents. A partial difference can be detected between policy documents (74% of the total amount of policy documents in Trento and Bolzano

61 Paris Agreement (Paris, 12 December 2015, in force 4 November 2016).

62 UN doc. A/RES/70/1 (21 October 2015).

63 The relevance of the Paris Agreement is due to various reasons: it introduced new roles for non-state actors, including subnational government levels; it defined for the first time a common objective at the international level to reduce GHG emissions; it had great visibility at the public level, increasing awareness both among the political figures and among the general population.

64 The Austrian sample of documents considered for this analysis is composed of selected sectoral laws, 15a B-VG agreements and policy documents from the data collection. With the latter term we mean narrative documents by the subnational governments including strategies, programs and resolutions. The EU reference means reference to EU climate policies and or to EU law (directives or regulations).

includes a EU reference) and legislative documents (67%).⁶⁵ Thus, reference to European directives and legislation is considerable in the four subnational areas, and in particular increases in the most recent documents examined. Furthermore, the reference to Europe is spread at cross-sectoral level, but particularly relevant in the case of energy and transport. In the case of energy, this is in line with the past (see, for example, the input given by “Energy efficiency first”⁶⁶ – a key objective in the EU vision – to the reduction of energy consumption in different policy areas). For the transport sector, the situation is quite “new”: according to various interviewees, this was not a key sector for CPI in the past decades, but has been particularly fostered in recent times also thanks to the role of vertical coordination.

Furthermore, it is also worth mentioning that some local governments, such as the Autonomous Province of Bolzano, have dedicated offices in charge of dealing with EU directives and policies, thus contributing to vertical coordination, especially when it comes to the attraction of EU funding for initiatives that deal with sustainability and climate change.⁶⁷

At the same time, local peculiarities and the possibility to legislate in an autonomous fashion are considered equally important, as well as the possibility to directly transpose EU legislation is seen as an added value of the subnational areas under investigation. This was positively highlighted in several interviews, such as by an interviewee who states: “in Italy, the adoption of European directives related to energy has not taken place in suitable timeframes. however, fortunately there is the possibility to legislate on a provincial level, skipping the state level and considering the European level directly”.⁶⁸ For example, the initial draft of the Provincial Energy and Environmental Plan of the Autonomous Province of Trento (2021) was developed in 2018 and had already set an objective of reducing GHG emissions by 55% by 2030, which was only later introduced by the EU in 2021. In the case of both *Länder* Tyrol and Vorarlberg, the *Land* has a clear-cut space of maneuver in the spatial planning sector and in specific fields of the energy sector, such as notably the building sector and specifically housing subsidies, which fall within the exclusive sphere

65 The Italian sample of documents considered for this analysis is composed of selected legislative documents (including sectoral laws and decrees) and policy documents from the data collection. With the latter term we mean narrative documents by the subnational governments including strategies, programs and resolutions. The EU reference means reference to EU climate policies and or to EU law (directives or regulations).

66 https://ec.europa.eu/info/news/energy-efficiency-first-accelerating-towards-2030-objective-2019-sep-25_en.

67 https://www.provincia.bz.it/it/contatti.asp?orga_orgaid=1156#staff.

68 IntTN_05.

of influence of the *Länder*.⁶⁹ In this case, as well as in others, such autonomy gave the possibility to go even beyond the objectives identified at the EU level.

Europe is also crucial because of specific funding related to climate change. This will be discussed in the Chapter 9; however, we want to remark that one case in particular mentioned during the interviews is the NextGenerationEU Plan, which notably foresees “green” initiatives, also following the call for a EU Green Deal launched by the President of the European Commission Von der Leyen. Respondents highlighted both the pros and the possible cons of this Plan and the vertical coordination it implies.

The national level is generally considered less important than the transnational and the European ones when it comes to CPI. Especially in the two Italian cases, the state assumes centrality especially in negative terms, with few positive mentions. However, the respondents did not generally consider the state to be a significant obstacle, apart from a number of situations linked to excesses of bureaucracy and formality, and because it is considered to produce too much legislation.⁷⁰

A difference between Austria and Italy should be noted here, as it was mentioned in several interviews. Austria has a federal Climate-Protection Law (*Klimaschutzgesetz – KSG*),⁷¹ which sets sectoral targets outside the European Emission Trading System and was described to present an ambivalent enforceability mechanism, which would not effectively bind to the set targets.⁷² While the KSG has concretized targets at a supra-regional level, the consequence mechanism, in terms of legal consequences deriving for the non-fulfillment, is not specified in the law. The EU sources are legally binding for the *Bund*; however, their fulfilment requires coordination within the state. Italy lags even further behind. Two relevant documents exist in relation to the national scale in terms of mitigation: the *Piano Nazionale Integrato Energia e Clima* (PNIEC), which outlines the route towards decarbonization between 2021 and 2030, and the *Strategia Italiana di Lungo Termine sulla Riduzione delle Emissioni dei Gas a Effetto Serra* (published in 2021).⁷³ On the other hand, Italy is still waiting to implement the *Piano Nazionale di Adattamento ai Cambiamenti Clima*. For this reason, many regions and the autonomous provinces have been taking steps independently, as highlighted by respondents of both autonomous provinces investigated.

69 IntT_02.

70 IntTN_01.

71 *Klimaschutzgesetz* BGBl. I No. 106/2011.

72 IntT_01; IntT_07.

73 See Chapter 2 in this volume.

Beyond the elements previously discussed, the political autonomy of the subnational areas under investigation has been mentioned in several interviews, and is generally considered a positive element by the whole set of respondents. This was highlighted for example in the transport sector, which is depicted primarily as a federal subject-matter in the Austrian cases, and which lacks a national plan in Italy. In this sector, there are no binding legislative sources at the *Land* level in Austria so far, which according to some respondents, could otherwise facilitate the sectoral integration of climate change. In the Italian case studies, the limited number of state regulations/policies in the transport sector may imply that subnational governments have more leeway to legislate in the transport, according to the needs of the territories. Thus, some respondents admitted that the national state has little responsibility when things do not work in an efficient manner, and that it is more correct to consider the subnational level when examining both positive and negative elements of management.

Some mechanisms of coordination described in 2.1 and 2.2 were also mentioned during the interviews as fundamental tools to help bridging local initiatives and national frameworks. Single examples include the Conference of *Land* Transport Representatives (*Landesverkehrsreferentenkonferenz*) and the collective development of sectoral measures, e.g. under the Climate Law (art. 3) in Austria, were identified as further mechanisms by which the Federal Government and the *Länder* adopt joint measures and the *Bund* can be confronted with specific sectoral needs. The State-Regions Conference was described as a fundamental mechanism in Italy, also in relation to climate issues, whose equivalent in Austria is the Conference of *Land* Climate Representatives (*Landesklimaschutzreferentenkonferenz*). In the Italian case, another important body recalled in the interviews and documents is the National System of Environmental Protection (*Sistema Nazionale della Protezione dell'Ambiente*), coordinated by ISPRA (*Istituto Superiore per la Protezione e la Ricerca Ambientale*), which brings together all of the regional and provincial environmental agencies in Italy.⁷⁴

74 For a detailed evaluation of the effectiveness of coordination among these Italian bodies – based on the quantitative analysis of decisions taken in the field of environmental protection – see M. Alberton, *Governance ambientale negli ordinamenti composti. Traiettorie italiane e spagnole tra unità e asimmetria* (ESI 2021).

3 Leadership towards Policy Integration of Climate Change

3.1 *Legal and Theoretical Framework*

Both Italy and Austria are parliamentary democracies. In relation to the separation of powers, leadership is in practice business of the governments. In the modern administrative state, while Parliaments set the legal framework for actions by the administration, governments form the dynamic part. They must be ambitious if they are to implement governmental programs into the legal order. Finally, governments form the supreme bodies of the administration, which are also accountable to Parliaments. It is therefore the respective governments that must enforce their goals and programs, including measures against climate change. The administrations themselves are not intended to develop leadership themselves, as they are subordinate to governments in constitutional terms.

In the classical framework of the separation of powers, the judiciary plays a rather conservative role. During recent years an essential change in the attitude of the judiciaries in many countries took place: they played a more dynamic role in applying international treaties, fundamental rights and national laws on aspects of environmental protection, specifically when it comes to climate change. This is reflected, for example, in the fact that the administrative courts are increasingly granting environmental organizations and citizens' initiatives a legal status in approval procedures of environmentally harmful facilities and the constitutional courts are increasingly recognizing fundamental environmental rights also in relation to climate change.⁷⁵ As far as can be seen, the constitutional and administrative courts in both Italy and Austria are still reticent in this respect. However, it can be assumed that they will follow the European trend.

Finally, both in Italy and in Austria, civil society exercises pressure on political decision-makers. Direct democracy can be exercised within certain limits. In both countries there exists the instrument of popular initiative, with which certain concerns can be brought to the attention of Parliament.⁷⁶ Furthermore, even if we do not investigate this aspect in depth, political pressure from civic and social movements can have an influence on decision-making;⁷⁷ however,

75 J. Setzer and C. Higham, *Global Trends in Climate Change Litigation: 2021 Snapshot*, Policy report (July 2021).

76 P. Bußjäger, "Demokratische Innovation und Verfassungsreform", in P. Bußjäger and A. Gamper (eds.), *Demokratische Innovation und Partizipation in der Europaregion* (New Academic Press 2015) 1–21, at 6.

77 D. della Porta and M. Caiati, "Europeanization from Below? Social Movements and Europe", *Mobilization: An International Quarterly*, 12 (2007) 1–20.

we do not assume it as an indicator of political leadership, but as the political response to leadership coming from civil society. Apart from this, the possibilities for direct democracy are rather limited and primarily fulfill a downstream function, namely to confirm or correct certain decisions that were taken.

The extent to which practice differs from or reflects theory will be clarified in the following.

3.2 *Leadership in Representations and in Practice*

The importance assumed by climate issues for the current subnational legislatures was emphasized in many interviews, often accompanied by the hope that leadership (political and administrative) may continue in this direction. Among the reasons that justify the interest of leaders, two are crucial: the influence of transnational climate governance and the increase in natural disasters. The first of these factors was discussed at length in the previous section and in Chapter 1. As regards natural disasters, specific reference was made to the 2018 Adrian Storm (especially in the two Italian cases) and to some local phenomena (eg the Val di Stava Disaster, which happened in 1985 in Trentino). The narrative is twofold. On the one hand, the political/administrative figures recognize the role played by natural disasters in increasing awareness; on the other hand, they claim the validity of measures adopted by the current legislatures in order to mitigate the effects, underlining the existence of already effective adaptation protocols. A third key factor highlighted in the interviews at cross-(sub)national level and that would affect the actions taken by policymakers, is the pressure exercised by civil society (and in particular youth climate movements). This aspect was emphasized by Austrian interviewees, both institutional and belonging to civil society, with reference to Fridays For Future (FFF).⁷⁸

In addition to these general elements, some peculiarities should be highlighted. For example, as recalled by an interviewee, the situation of the Autonomous Province of Bolzano is quite anomalous, since the same party – *Südtiroler Volkspartei* (SVP) – has been governing for the last few decades. However, this party formed an unprecedented coalition with the League (*Lega*) – a far-right populist party in Italy – following the 2018 election results.⁷⁹ According to another interviewee, this led to a weakening of

78 The aspect of the influence of civil society on decision-making processes at subnational level will be discussed in greater depth in Chapter 9 in this volume.

79 IntBZ_04. The SVP-League alliance in Bolzano (where the SVP is historically the leading party, and built government alliances with the centre-left in the last 20 years), as well as the victory of the League in Trento, should be considered within the framework of the Italian political panorama of the last years. In particular, at the 2018 national

the political leadership on climate issues as the competent department was entrusted to the League, but the real power is perceived to be in the hands of the German-speaking community and their governmental representatives.⁸⁰ Similarly, in the neighboring Province of Trento, some respondents from civil society highlighted a sort of provincialism among political figures/parties and the tendency to be overly influenced by bordering regions, especially Veneto. This is seen as a long-term trend but was reinforced by the results of the last provincial elections, which saw the victory of the League. However, in both cases (Bolzano and Trento), a number of positive administrative factors would mitigate the supposed criticalities of political leadership. In Bolzano, APPA Bolzano recently changed its name (to include “climate protection”): according to an interviewee in the administration, this is extremely significant in entrusting a greater role to the agency and its administrative figures.⁸¹ In Trento, according to all the respondents (even those from civil society), the identification of APPA as the general responsible for climate issues improved the effectiveness of horizontal cooperation between departments also thanks to the leadership assumed in terms of coordination and organization by some specific administrative figures at the provincial level. Some respondents go even further, such as an interviewee, who is hoping for the formalization of a political authority to tackle climate change, arguing that a standard is necessary to measure every policy in terms of its climate impact, thus suggesting to establish a councillorship for climate change or ecological transition, as has been done in Italy (and not only) at national ministry level.⁸²

What has been said for the Italian cases is to some extent relevant also for Austria. In Tyrol, the political leadership at the *Länder* level has been unanimously identified as the propulsive force of climate-change integration in sectoral policies, following a progressive evolution in the acknowledgment of the urgency of the climate-change problem.⁸³ This evolution at political level was deemed to have recently culminated in the amendment of the *Land* Constitution with the anchoring of climate protection and sustainability as goals of the *Land*.⁸⁴ This is even more true for Vorarlberg, which was the first

political election, the League reached its highest electoral results, at the point that 2018 was defined “the year of the League” (<https://www.youtrend.it/2018/12/28/1l-2018-dei-part-iti-lanno-della-lega/>); on the imposition of backlash politics in Italy and the reactions from civil society, see also: D. della Porta *et al.*, *Resisting the Backlash* (Routledge 2022).

80 IntBZ_02.

81 IntBZ_01.

82 IntTN_06.

83 IntT_01; IntT_05.

84 IntT_06. See Chapter 2 in this volume.

Austrian *Land* to declare the state of climate emergency, a resolution approved by the *Land* Parliament in 2019.⁸⁵ The state of emergency abstractly entails a preventive check and review on new laws, regulations, and directives for grants in terms of climate change adaptation and mitigation.⁸⁶ Vorarlberg's interviewees reported that climate change has developed into a focal point also for the administrative leadership, which would be testified by the ongoing project "Mission ZeroV – first climate-neutral *Land* administration" by which the administration is to act as a role-model in the fight against global warming⁸⁷ and by the fact that no department reacts to climate change with disinterest.

According to many political and above all administrative figures,⁸⁸ the change in political leadership at government level did not bring any particular steps forward or backward across the years.⁸⁹ However, the fact that some civil society respondents are less enthusiastic makes it correct to carefully evaluate a unilateral positive vision of political leadership in the areas investigated, highlighting as the role of leadership can be sometimes more symbolic than substantive. This is why we also analyzed the electoral and government programs. In longitudinal terms, the issue of climate change has assumed increasing importance in the electoral programs of the main parties in all four territories considered. Comparing the programs of the last elections (2018 for the Italian autonomous provinces, for the Austrian *Länder* 2018 in Tyrol and 2019 in Vorarlberg) with those of the previous ballots, the environmental, climate and sustainability issues are increasingly present.

In Bolzano, for example, the Greens proposed specific measures such as a "Climate Law" that would make the *KlimaPlan*⁹⁰ binding, and the establishment of a provincial sustainability manager. Also noteworthy is the reference in the program to "system change, not climate change", a popular slogan among youth climate movements, such as FFF. In the case of the other main

85 IntV_06.

86 IntV_02; IntV_03. However, the resolution has only symbolic legal effect and does not trigger any actual obligations to act. See J. Fitz *et al.*, "Klima, Luft und Mobilität", *juridikum*, 4 (2019) 510–513, at 510.

87 A program started in 2019, following the unanimous decision by the *Land* Parliament in 2018, by which Vorarlberg's administration is to become climate-neutral by 2040.

88 IntT_01; IntT_04; IntT_06; IntV_05; IntV_06; IntTN_05; IntTN_07.

89 It is important to stress that this is the representation offered by the administrative figures and the exponents of the political parties in power. More critical reflections were presented earlier in the chapter, as well as by the opinions of some civil society's respondents mentioned in the next lines.

90 See <https://ambiente.provincia.bz.it/energia/piano-clima-energia-alto-adige-2050.asp>. The *Klimaplan* is described in depth in Chapter 5 in this volume.

parties, with the partial exception of the Five Stars Movement (*Movimento Cinque Stelle*, historically focused on environmental issues, especially at the local level), the references to climate issue were more nuanced. The electoral results envisioned a partial reshuffling compared to previous legislatures, with the formation of a governing coalition formed by the League and the SVP. The government program strongly insisted on reinforcing existing policies, and emphasized the importance of environmentally-friendly consumption/production mechanisms: unlike the Greens' program or the frames advanced by climate movements, the register is that of the simultaneous pursuing of economic and ecological results.

The 2018 election results were unprecedented also in Trento, with the victory of the League after 20 years of center-left governments. In the government's priorities, emphasis is placed on territorial infrastructures, such as the renewal of the A22 concession and the construction of the Valdastico route, a strategic infrastructure connecting areas in Veneto and Trentino with a high industrial presence, and whose realization has been debated for several decades, also envisaging a strong opposition from some sectors of civil society. Also in Trento, the electoral programs gave great importance to climate and the environment, but without identifying any radical solutions: this is true both for right-wing (and center-right) and for center-left parties, while more attention was paid by left-wing parties such as the *Liberi e Uguale/L'Altro Trentino*. For example, the Democratic Party's program tackled the topic in an embraceable but rather generic way, focusing on the concept of sustainable development and hoping for the continuation of the (sectoral) policies launched in previous legislatures. It is difficult to assess how much this approach influenced the election results, but considering the importance assumed by climate issues for the Italian electorate,⁹¹ it is plausible that a greater centrality of such an issue could have led to different results.

In both Austrian *Länder* the last elections were characterized, in line with previous trends, by the attribution of the highest number of seats to the *Österreichische Volkspartei* (ÖVP) and by the resulting creation of coalition governments between the ÖVP and the Green Party (*Grünen*).

In Tyrol, the program of the current Government *Platter III* (2018–2023) introduces broad objectives in connection with climate and environmental protection, which represent a specific field of action. Moreover, climate change is incidentally thematized in other sectors such as tourism, disaster

91 See the National Observatory on sustainable lifestyle, and the data on the electoral priorities of Italians, especially younger ones.

prevention, energy and mobility policy. Emphasis is put on the continuation of initiatives by the past legislature in relation to “*Tirol 2050*”⁹² and the reduction of the impact of transit traffic (until the completion of the Brenner Base Tunnel in 2027). The *Land* has also recently committed to forming a climate neutral administration, similar to that of Vorarlberg, in the new Sustainability and Climate Strategy (2021). The Tyrolean Government further recently (2021) announced a number of climate measures such as the introduction of a qualitative preventive climate check on new laws, ordinances and directives and of a photovoltaic mandate for new public buildings as of January 2022.⁹³

It should be noted that Vorarlberg’s leadership has shown a long-lasting concern for the preservation of the climate and environment of the *Land*. This is confirmed by the early constitutional entrenchment of climate protection (2008) and the early commitment to energy autonomy (2009). As a consequence, climate change acquires centrality in most electoral programs as a standalone topic but also in sectoral policies.

The *Grünen* represented the second party in the last elections in 2019. The electoral program proposed the adoption of a climate law to set climate measures and binding targets. In the current program of the Government *Wallner III* (2019–2024), besides the continuation of the energy autonomy activities, some of the relevant planned measures are: the implementation of the decision by the *Land* Parliament to declare the climate emergency (see above); the preparation of a collective amendment law (*Sammelnovelle*) to adapt existing legal provisions to climate protection goals; the increase in the climate budget and the continuation of the climate dialogue with businesses.

Beyond the narratives proposed by the interviewees and the declared objectives presented in the electoral programs, we also consider a few data referred to the current trend of GHG emissions, assuming this as a measure to evaluate the substantive and not only symbolic dimension of leadership because it foreshadows the effects of policy measures on the most important indicator to assess mitigation.⁹⁴ In general terms, it should be emphasized that GHG emissions increased from 1990 in the subnational cases considered.⁹⁵ Thus,

92 *I.e.* the energy autonomy program of *Land* Tyrol. For more information see Chapter 3, section 3 in this volume and under following link: <https://www.tirol2050.at/>.

93 <https://www.tirol.gv.at/meldungen/meldung/lh-platter-und-lhstvin-felipe-tirol-muss-klimafit-in-die-zukunft-gehen/>.

94 On the time-lag between the adoption of environmental policies and the effects on the environment, see A. Undendal, “Complexity and Challenges of Long-Term Environmental Governance”, *Global Environmental Change*, 20 (2010) 386–393.

95 We here consider 1990, as it is often set as a reference point in terms of climate goals.

actions implemented are less incisive than what the representations collected in the interviews (especially those of administrative and political figures) and the documents examined would suggest. Such discrepancy does not mean that the process carried out so far is without merit, but, rather, that the path towards the effective achievement of climate objectives, set by international governance and informed by indications coming from scientific bodies such as the IPCC, is still long and requires more effective actions with a focus on the concrete operationalization of the objectives in practice.

More specifically, Tyrol produced the equivalent of 8.5% of the Austrian overall GHG emissions in 2019. GHG emissions rose by 15% between 1990 and 2019, whereby a slight improvement, due to a reduction of 0.6%, was recorded from 2018 to 2019.⁹⁶ Looking at the overall CO₂ emissions per capita, in 2019 Tyrol produced 6.3 tonnes of emissions per capita, therefore lower than the national average of 9.0 tonnes.⁹⁷

Vorarlberg is the second smallest *Land* in Austria. The *Land* produced the equivalent of only 2.6% of the national overall emissions. The overall CO₂ emissions produced in 2019 are 3.3% higher than the level of 1990. However, it should be noted that the 2017 GHG emissions outside the ETS were reduced by 3.5% compared to 2010. The per capita emissions produced by Vorarlberg in 2019 amounted to 5.3 tonnes and hence were clearly lower than the national average of 9.0 tonnes. In Vorarlberg we observe a tendency to decrease of per capita overall emissions from 6.2 tonnes in 1990 to 5.3 in 2019.⁹⁸

For the two Italian provinces examined in our research, we consider the data of the national emission inventories, released by ISPRA (*Istituto Superiore per la Protezione e la Ricerca Ambientale*).⁹⁹ Considering tonnes

96 These data refer to the period between 1990 and 2019, as the latest updated available dataset.

97 Source: Umweltbundesamt, „Bundesländer Luftschadstoff Inventur 1990-2019“, REP-0787, (Wien 2021), at 128–130 and Global 2000, Klimareport – Die Bundesländer im Vergleich (2019), at 43.

98 Source: Umweltbundesamt, Bundesländer Luftschadstoff Inventur 1990-2019, at 139–141 and Global 2000 Klimareport – Die Bundesländer im Vergleich, at 46.

99 ISPRA makes these estimates on behalf of the Italian Ministry of Ecological Transition and within the framework of the UNECE Convention on Long Distance Transboundary Air Pollution (Geneva, 13 November 1979, in force 16 March 1983). The main report is available here: https://www.isprambiente.gov.it/files2022/pubblicazioni/rapporti/dis_inv_na_z_12luglio_2022_rev-1.pdf. Disaggregated data can be consulted at this link: <https://annuario.isprambiente.it/pon/basic/43>. These data are updated to the previous version of the inventory as they relate to the 2021 national data submission.

of CO₂ equivalent emissions,¹⁰⁰ a general rise was registered from 1990 to 2019: 6,414,388 v. 7,674,959.¹⁰¹ In this time-frame, the trend of the province of Bolzano was slightly better than Trento's: 3,195,731 v. 3,507,492 for Bolzano, 3,218,657 v. 4,167,468 for Trento. Interestingly, a peak was reached in Trento in 2005 (4,461,204) with a partial later decrease, while the same did not happen in Bolzano, which experienced a more linear growth during the last thirty years without particular up and down dynamics (with a slow linear decrease from 2010 to 2017 and again a slow linear increase after that). Finally, according to the data from the national inventory of ISPRA, the impact of CO₂ equivalent emissions of the two Autonomous Provinces of Trento and Bolzano would be around 1.8% of the national total (1.0% Trento; 0.8% Bolzano).

4 Concluding Remarks

In conclusion, the two analysed dimensions of coordination and leadership play a decisive role in climate policies in the selected case studies. Additionally, these vertical and horizontal coordination proved to be intertwined and to represent two sides of the same coin. The involvement of different actors in overlapping competency fields requires well working coordination mechanisms between different levels of government and between different stakeholders at the same level of government. Coordination between different levels of government needs to coexist with the coordination between departments that are responsible for the implementation of any concerted decision-making. Conversely, a strong coordination between stakeholders at the same level of government will have positive consequences well grounded representation of subnational instances in the framework of vertical coordination mechanisms. Vertical and horizontal coordination is also not only inherent in multi-level governance systems, such as Austria and Italy, characterized by a complex division of powers, but was also confirmed to represent a core element for CPI. At the same time, the commitment to climate change goals of political leaders and managers in the public administration directly impacts CPI and shapes mitigation and adaptation actions in practice, even if there is a large room for improvement in the future.

¹⁰⁰ CO₂ equivalent is a measure that expresses the impact on global warming of a certain amount of GHG compared to the same amount of carbon dioxide. It is therefore an indicator used to simplify the reading of the impacts of various GHG (such as methane or nitrogen monoxide) by converting it to equivalent values of carbon dioxide.

¹⁰¹ These data and the following are expressed in tonnes of CO₂ equivalent.

As for the horizontal dimension of coordination, there is substantial evidence of co-formulation of climate measures by different sectoral actors. Moreover, beyond the strategic level, specific intra- and inter-departmental mechanisms are activated to facilitate mainstreaming in practice. However, despite the existence of an institutional framework to deal with climate change and despite the operativity of certain dedicated mechanisms in all analysed case studies, coordination is mostly informal, case-specific, and limited to the strategic level. Its effectivity was questioned by both institutional respondents and interviewees from civil society. Indeed, the interviewees expressed their concern with the implementation of shared objectives and identified room for the improvement of interdepartmental coordination.¹⁰² The respondents specifically stressed the need for the coordination culture to be developed, in terms of the systematization and institutionalization of cooperation. Possible options to overcome the reported obstacles to effective coordination include:

- institutionalizing direct exchange between departments;¹⁰³
- identifying climate referents within the single departments, so as to enhance the quality of exchange between the latter and climate coordinators;¹⁰⁴
- enabling the coordinating units to set vertically binding measures, so as to influence sectoral mainstreaming;¹⁰⁵
- identifying and improving coordination in relation to relevant sectoral overlaps;¹⁰⁶
- establishing figures at the local level who are similar to ministers of ecological transition.¹⁰⁷

On the other hand, vertical coordination has emerged as one of the main drivers (if not the main one) of CPI. In particular, the turning point brought about by the Paris Agreements was highlighted, within a more general framework based on the concept of sustainable development, and the decisive role played by the European Union was discussed in almost all the interviews both for the identification of the vision and for the definition of specific directives and

102 IntBZ_04; IntTN_10; IntV_04; IntT_01.

103 IntV_02.

104 IntV_06. I.e. administrative figures belonging to the herein mentioned coordinating units (section 3), who have the institutional task to coordinate sectoral efforts to integrate climate change and to report on the progress of the implementation of climate measures.

105 IntT_04.

106 IntTN_10.

107 IntTN_06.

legislation. Such milestones and the influence of international governance are also abundantly referred to in the analysed documents. The national level is considered less relevant, and the state/*Bund* is mentioned especially as an implementer of standards set by the European Union.

As anticipated, leadership at different levels of government and also across borders, is deemed to influence coordination, translating into tasks and measures and stimulating synergies between authorities and, within the authorities, between different policy sectors. The propulsive force in the advancement of climate change discourse at subnational level was generally identified in political leadership, while the commitment of sectoral administrative leadership is linked to the effectiveness of the actions. This is especially true, considering that the implementation of climate measures mostly occurs on a voluntary basis, in the absence of binding targets and enforceability mechanisms at subnational level. In fact, results, measured in emission reductions in the last thirty years, proved to be less effective than expected, and not always discourse were coherently put in practice. At the same time, the identification of agencies responsible for climate issues and specifically for CPI testifies to the importance assumed by environmental/climate issues for sub-national governance, at least in the Alpine region. The interviews conducted in the case studies evidenced a generalized trend towards considering climate change a topic of interest at political level, irrespective of the political orientation or the targeted constituency. However, most representatives of civil society, along with some institutional respondents, stressed that the commitment in theory still needs to find a proper correspondence in practice, a finding that is partially confirmed also looking at the effective and concrete GHG emissions trends.¹⁰⁸ Indeed, despite the trend to set out broad measures in all territories, policy-making still lacks the identification of short-term objectives and clear implementation timelines.

To conclude, even though a positive change towards climate awareness was identified in all territories, both with regard to leadership and the connected coordination mechanisms, there is recognizable room for improvement in respect of the implementation of the planned measures: to name only a few aspects – that will be better discussed in the conclusions of the volume – we refer to the identification of a common path to solidify the implementation of co-formulated measures, the possibility to dispose of higher economic resources to better organize vertical coordination (by both competing to

108 IntV_01; IntV_04.

European tenders and at the same time improving the connection with local municipalities), a mentality more prone to horizontal collaboration beyond the sectorial interests and the specific priorities of single departments.

Funding Climate Change

A Subnational Government Perspective

Mathias Eller and Alice Valdesalici

1 Introduction: Spending Responsibilities at the Subnational Level¹

The implementation of climate policies, both world- and nationwide, requires effort at all levels of government. From a public law perspective, these can be traced back to the various state functions, that is the legislative, administrative, and jurisdictional power, to which the power to raise revenue and to spend should also be added to provide a comprehensive picture. In addition to the creation of an appropriate legal framework, financial incentives from which both companies and individuals can benefit are one of the most important steering instruments to ensure a more climate-friendly coexistence in the future.

Climate change-related spending at the subnational level of government is the focus of this Chapter. After some general introductory remarks, spending in the field of the *Länder* Tyrol and Vorarlberg in Austria, and of the Autonomous Provinces of Bolzano/Bozen and Trento in Italy – the latter two also known, respectively, as South Tyrol and Trentino – is addressed by combining an analysis of spending budgets with empirical illustrative examples (sections 2 and 3).

First and foremost, the analysis of subnational spending on climate change cannot be separated from the division of competences between the different levels of government, given the instrumental nature of the former in relation to the latter. Put differently, public expenditure reflects the scope of political autonomy in the respective subnational government. Indeed, it can be stated that the distribution of expenditure powers is, by and large, linked to the combined scope of the legislative and administrative competences assigned to each level of government.²

A problematic aspect of the following analysis lies in the fact that the distribution of expenditure responsibilities among the different levels of

1 This Chapter is the product of a joint effort. Mathias Eller authored section 2, while Alice Valdesalici wrote section 3. Sections 1 and 4 have been co-authored.

2 G. Anderson, *Fiscal Federalism: A Comparative Introduction* (Oxford 2010).

governments of a federal system is generally not the result of an explicit enumeration of each government's responsibilities, as it usually occurs for the allocation of competences in the traditional understanding (e.g., through legislative powers).

This is at least the case in Italy. Although all territorial entities have spending autonomy as prescribed by the Constitution (article 119), neither the Constitution nor the Autonomy Statute of the two Autonomous Provinces of Trento and Bolzano make any reference to the concrete allocation of spending responsibilities (or of the criteria thereof). In practice, they are predominantly demarcated by the exercise of administrative functions: the level responsible for a certain administrative function is also responsible for the expenditure arising from the former. In addition, the extension of expenditure responsibilities is hypothecated to revenue autonomy, with particular regard to the amount of resources available overall. In fact, this element conditions the subnational degree of spending autonomy *a priori* and represents an intangible limit for all subnational governments, if not for exceptional cases regulated in detail.

In Austria, the spending power of the *Länder* is only indirectly linked to the distribution of competences. Article 17 of the Federal Constitution (B-VG) stipulates that the *Bund* and the *Länder* may act in all forms of private law without reference to the distribution of competences.³ Therefore, areas that fall under the exclusive legislative and administrative competence of the federation may also be promoted by the *Länder* and *vice versa*. This applies in particular to climate change measures, which, as a so-called "cross-cutting issue", may in any case affect the legislative and administrative competence of both levels of government. However, the distribution of financial resources is reserved for a separate constitutional law, i.e., the Finance Constitution Act 1948 (F-VG).⁴ The provisions of this Act therefore have an extraordinary impact on the budgetary resources generally available to the *Länder* and must therefore be considered in an overall context.⁵ For example, § 2 F-VG stipulates that, unless otherwise prescribed by the competent legislation, the territorial authorities shall, in principle, bear the expenses arising from the performance of their

3 Article 17 B-VG: "The provisions of Articles. 10 to 15 with regard to competence of legislation and execution in no way affect the position of the Federation and the provinces as the holders of civil rights".

4 StF: BGBl. No. 45/1948 as amended by BGBl. I No. 51/2012.

5 F. Sutter and T. Pfalz, "Verteilungsnormen und Verteilungsgerechtigkeit im Finanzverfassungs- und Finanzausgleichsrecht", in G. Baumgartner *et al.* (eds.), *Verteilungsgerechtigkeit im Recht* (Verlag Österreich 2017) 487–612, at 487ff. See also below 2.1.

duties. § 4 F-VG, in turn, restricts this requirement prescribing that the limits in terms of capacity of the participating territorial authorities are not exceeded.

In addition, in order to understand the effective relevance of the spending powers at the subnational level, some other points also need to be considered.

First, the execution of federal legislation is frequently assigned to the subnational governments and consequently the expenditure responsibilities are broader than the mere allocation of legislative and executive competences explicitly assigned by the national or subnational Constitution might suggest. This allocation scheme is labelled ‘administrative federalism’,⁶ and is common in both Austria and Italy, which as federal systems⁷ are ascribed to the category of cooperative federalism (with all the limits inherent in such classification). The cooperative archetype portrays the image of entanglement as opposed to the idea of ‘watertight compartments’,⁸ a legacy of dual federalism. The first one can be described as an integrated form of federalism in which overlaps of functions of the national and state governments are frequent, whereas the second rests on the idea that the national and state governments have distinct and separate government functions. Despite the fact that this classification is mostly limited to the theoretical sphere and is therefore mostly outdated in practice, the link between ‘administrative federalism’ and the ‘cooperative paradigm’ lies precisely in the integrative dimension of the latter, whereby the same competence (e.g., healthcare, education, transport) is ‘governed’ by more than one level of government, with one or two governments entitled to the legislative function (often the federal government alone or together with the subnational government) and the others (often the subnational and/or local) levels of government vested with the administrative functions therein, hence the denomination of ‘administrative federalism’.

Furthermore, in the case of the Autonomous Provinces of Trento and Bolzano/Bozen, the scope of political autonomy is determined not only by the

6 On the concept of administrative federalism (*Vollzugsföderalismus*) according to German scholars, see T. Krumm, *Föderale Staaten im Vergleich. Eine Einführung* (Wiesbaden 2015), at 186ff.

7 The expression ‘federal system’ is used here and elsewhere in the chapter according to the definition provided in F. Palermo and K. Kössler, *Comparing Federalism: Constitutional Arrangements and Case Law* (Hart Publishing 2017), at 8–9, to include ‘all those systems in which at least two political tiers of government exist, thereby combining *self-rule* with *shared rule* and thus making use (to a greater or lesser extent) of the federal toolkit’.

8 The metaphor goes back to a statement of Lord Atkin in the *Labour Conventions* case: “[w]hile the ship of state now sails on larger ventures and into foreign waters she still retains the watertight compartments which are an essential part of her original structure”. See *A.-G. Canada v. A.-G. Ontario (Labour Conventions)*, [1937] A.C. 326 at 354, 1 D.L.R. 673 (P.C.).

Statute of Autonomy and the national Constitution (for the applicable parts), but also by the enactment decrees of the Autonomy Statute, which are by-laws that regulate – amongst other things – the transfer of administrative and legislative powers, in some cases even beyond the provisions of the Statute.

Second, in most federal systems spending powers are not limited to the *enumerated* (legislative and/or administrative) competences alone. Instead, both orders of government may be allowed to spend in areas beyond their jurisdiction, which is in practice almost on every object.⁹ While this trend is particularly evident at the federal level,¹⁰ subnational governments too may spend beyond their assigned competences but within their territory. Nevertheless, major constraints arise in these cases from fiscal discipline. Both Austria and Italy have in fact introduced balanced-budget rules, which are in theory related to both revenue and spending responsibilities, but in practice mainly affect the latter. The tools each of the two countries have introduced to comply with the ever more stringent obligations under the European system of economic governance have mostly resulted in spending cuts at the subnational level, also because the power to tax is in both cases strongly centralized.

Bringing the focus on to climate change, here policies are as a rule integrated within different sectoral policies. In turn, within these different policy areas climate change may in some cases be a direct goal, whereas in others it is an indirect consequence of the exercise of activities aimed at satisfying other primary interests. This dynamic is fully reflected on the expenditure side.¹¹

The most obvious result is a strong fragmentation of spending policies in this area, though other critical issues do emerge. These are linked to the complementary nature of climate change policies (for combating or preventing climate change) within the context of the sectoral policies under analysis. As such, although the budgets of all four subnational governments contain an

9 T. Courchene, “Reflections on the federal spending power: practices, principles, perspectives”, *Queen’s Law Journal*, 34 (2008) 75–124.

10 The federal level tends to make larger use of the “general spending power”. See F. Palermo and K. Kössler, *Comparative Federalism*, *supra*, at 229ff. – to pursue its own objectives in areas of subnational jurisdiction, this way widening the scope of influence. The issue has been highly contentious overseas. In the US, for instance, the federal government has been recognized an extensive power to spend in areas of state jurisdiction. But this has become an issue even in European federal systems, in particular after the economic crisis broke out in 2008–2010. The center has either progressively started a spending review process or introduced stimulus measures, which end up interfering with areas of subnational jurisdiction.

11 IntBZ_01, IntBZ_05, IntBZ_06, IntBZ_07.

expenditure entry classified as ‘sustainable development and protection of land and environment’ in Italy,¹² or ‘environmental protection’ in Austria,¹³ the data therein are not fully satisfactory for at least two reasons.

A first problem concerns the fact that environmental protection and climate change adaptation and mitigation are two different things. If the latter might to a certain extent be included in the former, it is not possible to draw a clear line between the two items of expenditure. This is not due so much to policy-related reasons – for which it would in fact be possible to distinguish between what falls under the former and what falls under the latter subject-matter, although some overlaps might anyhow exist due to the indirect effects that policies in one sector can have on the other. Rather, this impasse is due to the operational solutions taken up by both Austrian and Italian public accounting systems, in which no reference is made to climate change adaptation and mitigation. Thus, the only data available concern environmental protection, which is not the real subject of this analysis.

A second issue concerns the fact that climate change-related spending can be traced back to multiple sectoral policies (certainly those covered by this research, i.e., transport, energy, water, and spatial planning). Within these, the allocation of spending to climate change purposes is often indirect and does not stand out clearly in the subnational budget. If one looks at the sectoral expenditure, the item ‘climate change’ does not appear. It is only by analysing the planning documents of the different policies that the direct or – more frequently – indirect impact of a tool in terms of climate change adaptation or mitigation can eventually emerge. Nevertheless, this tells us that such a goal is somehow taken into account, but it does not provide any measure of the related spending in this precise area of concern.

12 See harmonized budget scheme, D.lgs. 118/2011, as later modified. The respective provincial budgets are available at the following links: <https://www.provincia.bz.it/amministrazione/finanze/bilancio-rendiconto.asp> and <https://www.consiglio.provincia.tn.it/attivita/programmazione-dei-lavori/Pages/Sessioni-Bilancio.aspx>.

13 See statement of accounts *Land Tirol 2020*, available at https://www.tirol.gv.at/fileadmin/themen/statistik-budget/budget/downloads/2020/Rechnungsabschluss_2020/Rechnungsabschluss_2020_Gesamt_Druckversion_Landtag.pdf, 221ff. All Internet sources in this chapter were accessed on 29 June 2022. Nevertheless, this expenditure entry represents only a fraction of the costs incurred by the Tyrolean government for climate change measures. Climate-related spendings can also be found in numerous other expenditure entries. This is due to the lack of a central climate budget (see below in text).

2 *Land Tyrol and Land Vorarlberg – Austria*

2.1 *Preliminary Remarks*

At the outset, it should be noted that an analysis of the funding policy of the Austrian *Länder* Tyrol and Vorarlberg (as well as of the Autonomous Provinces in Italy) in the areas to be examined is faced with the problems already highlighted in the Introduction. A comparison of the *Länder* among themselves or between the Austrian and Italian territorial entities is therefore only possible to a limited extent and should be viewed with reservation.

Against this preliminary remark, this section will first illustrate the basic aspects of the climate change funding policy in the Austrian administration and then analyze the specificities of the *Länder* Tyrol and Vorarlberg in detail.

First of all, one must be aware that the vast majority of subsidies and grants in Austria are provided to applicants by means of private law, either by the regional authorities themselves or by other legal entities (e.g., public corporations).¹⁴ It further follows that the administration of subsidies in general and for climate change measures in particular is not bound by the applicable distribution of competences. In the single subject matters of ‘transport, energy and water’ that are under examination here, this circumstance proves to be quite an advantage from the point of view of the *Länder*. In these areas, which are essential for climate protection measures, the *Länder* are still able to exert a certain degree of influence within the framework of funding administration, despite holding only limited competences in contrast to the federation.¹⁵ Conversely, the *Bund* is allowed to take private-law governed action within its sphere of federal competences, but also, for instance, in spatial planning subject matter, although it has only little legislative or enforcement competences in this area.¹⁶ At times this circumstance leads to the funding of measures at

14 See B. Raschauer, “Verwaltungshandeln”, in G. Holzinger, P. Oberndorfer and B. Raschauer (eds.), *Österreichische Verwaltungslehre* (Verlag Österreich 2013) 157–218, at 169.

15 On the competence law situation in connection with traffic law, see H. Hauenschild, “Kraftfahrlineiengesetz und Öffentlicher Personennahverkehr”, in L. Bauer (ed.), *Handbuch Verkehrsrecht* (facultas 2009) 473–496, at 476. The competences in energy law are shared between the federal government and the *Länder* (art. 10(1)(10), art. 12(1)(5) and art. 15 B-VG), in many cases, however, this is also overlaid by so-called “competence coverage clauses” in favor of the federal government (see for example § 1 *Erneuerbaren-Ausbau-Gesetz*, StF: BGBl. I No. 150/2021 as amended by BGBl. I No. 7/2022). On the predominance of the federal government within the framework of water law, see for example M. Akyürek, “Wasserrecht”, in N. Raschauer and W. Wessely (eds.), *Handbuch Umweltrecht* (facultas 2010) 236–269, at 238ff.

16 Regulations concerning the planned and foresighted overall design of an area with regard to its development and for the preservation of essentially undeveloped areas are basically

both governmental levels (so-called ‘multiple funding’), especially in the case of larger projects. In such cases, funding policy is mostly coordinated between the federal government and the *Länder*. Fundamental issues of climate policy, on the other hand, are discussed in the National Climate Protection Committee at federal level. At state level, the so-called ‘*Landesklimaschutzreferenten*’ meet regularly to discuss key climate protection issues.

It should also be noted that due to the distribution of tasks and competences in climate-relevant areas, several organizational units or agencies are entrusted with the granting of subsidies across the provincial administration.¹⁷ If coordination between the funding agencies is not optimal, this can lead to undesirable multiple funding and efficiency deficits.

Irrespective of this, the scope for action of the subnational units (also including the municipalities) in the area of climate change funding is naturally dependent on their financial resources. With regard to the allocation of financial resources, the provisions of the Finance Constitution Act 1948 and the underpinning Financial Equalization Act (*Finanzausgleichgesetz* – FAG),¹⁸ in which the *Bund* is granted a particularly strong role, must also be taken into account. Nevertheless, questions of financial constitutional law and financial equalization law are excluded for the purposes of this contribution. Instead, the aim is to evaluate what influence the *Länder* Tyrol and Vorarlberg can exert by promoting climate-compatible projects and how such funding measures work in practice.

2.2 *Tyrol and Vorarlberg – (an Attempt) at Comparative Analysis*

In Austria and its *Länder*, the conviction and awareness that climate protection and climate change adaptation represent a global challenge that requires

covered by the spatial planning competence of the *Länder*. However, the general spatial planning competence must be distinguished from so-called specialized planning competences of the federal government, e.g. in the areas of transport (art. 10(1)(9) B-VG), for federal roads (art. 10(1)(9) B-VG), in mining (art. 10(1)(10) B-VG) or in water law (art. 10(1)(10) B-VG).

- 17 In Tyrol, all subsidies related to housing construction (e.g.: window replacement, insulation protection, efficient water heating) are handled by the Department ‘*Wohnbauförderung*’, while the department ‘*Wirtschaftsförderung und Fördertransparenz*’ is responsible for handling subsidy applications from small and medium-sized enterprises in the context of energy-saving measures (e.g.: thermal building renovation).
- 18 Currently FAG 2017 BGBl. I No. 116/2016 as amended by BGBl. I No. 10/2022, which in § 23(1) and (2) regulates the financial allocation to municipalities for the promotion of local public transport companies.

a joint solution has prevailed in recent years.¹⁹ Impressive proof is already provided by some state constitutions, such as those of Tyrol²⁰ and Vorarlberg,²¹ in which climate protection has been explicitly anchored as a state goal.²² The prerequisite is action to reduce anthropogenic climate change and its effects at all levels of government.

In Tyrol, this pro-climate protection position can be clearly demonstrated both strategically and operationally.²³ With the newly updated and reinforced ‘Sustainability and Climate Strategy’,²⁴ fields of action were identified, above all in the areas of ‘energy and climate protection’, ‘mobility and infrastructure’ as well as ‘building regulations and spatial planning’ in order to achieve the goal of being independent of fossil energy sources by 2050 (*‘Tirol 2050’*²⁵). The adoption of the new ‘Sustainability and Climate Strategy’ in Tyrol also brought about a paradigm shift: in future, decisions of the Tyrolean provincial government must be examined primarily in light of their climate compatibility. Naturally, in this context, financial incentives play a decisive role in the implementation of climate-relevant measures. The objectives pursued are not only to promote innovations through targeted funding, but – more importantly – to influence the social behavior of the entire population. Sustainability and climate protection should follow a ‘bottom-up’ approach to achieve high acceptance of climate protection and climate change adaptation measures.

The Vorarlberg administration is also strongly committed to climate protection and recently adopted the strategy paper ‘Energy Autonomy + 2030’²⁶ in the Vorarlberg *Land* Parliament. Vorarlberg is to be mentioned as a pioneer

19 See, for example, C. Kettner and D. Kletzan-Slamanig, “Climate Policy Integration on the National and Regional Level: A Case Study for Austria and Styria”, *International Journal of Energy Economics and Policy*, 8(4) (2018) 259–269, at 269ff.

20 *Tiroler Landesverfassungsgesetz vom 21. September 1988 über die Verfassung des Landes Tirol (Tiroler Landesordnung 1989)*, StF: LGBL. No. 61/1988 as amended by LGBL. No. 133/2019. (art. 7(3)).

21 *Verfassungsgesetz über die Verfassung des Landes Vorarlberg*, LGBL. No. 9/1999 as amended by LGBL. No. 3/2022 (art. 7(7)).

22 See Härtel, I., “Klimaschutzverfassungsrecht: Klima-Staatszielbestimmungen im Föderalismus”, *Natur und Recht*, 42 (2020) 577–588, at 586.

23 See, for instance, the “lighthouse projects” mentioned in the “Sustainability and Climate Strategy” (62ff.), which are coordinated by the various departments of the Tyrolean government.

24 See <https://www.tirol.gv.at/landesentwicklung/nachhaltigkeits-und-klimakoordination/tiroler-nachhaltigkeits-und-klimastrategie/>.

25 See <https://www.tirol2050.at/>.

26 See <https://www.energieautonomie-vorarlberg.at/de/strategie-energieautonomie-2030-neuer-schwung-fuer-die-naechste-dekade>.

region in terms of energy autonomy in general, as the first strategy paper in this area was drafted in 2009 and thus six years before the Paris Climate Agreement came into force. Unsurprisingly, the *Land* is the frontrunner in Austria, especially in the expansion of renewable energy sources. Vorarlberg also pursues an active funding policy in climate-relevant areas to achieve the implementation of the goals stated in the strategy paper within the time frame it has set itself.

Both *Länder*, Tyrol and Vorarlberg, provide targeted financial support in the areas examined, as shown below in Table 1 (Tyrol) and Table 2 (Vorarlberg).

Most funding provided by the *Länder* Tyrol and Vorarlberg is linked to specific funding guidelines. Depending on the field of action/lead measure, funding recipients can either be private individuals, individual enterprises, commercial companies, partnerships and corporations, cooperatives, associations, or municipalities and associations under public law.

In the interviews conducted with civil servants in the Tyrolean and Vorarlberg administrations²⁷ the European level was identified as the decisive driver for climate policy in the Member States and regions ('EU regional funding policy'). There was also agreement that the distribution of financial resources will undoubtedly increase significantly in absolute figures in the future, as climate protection will continue to enjoy the highest priority in national and subnational policies. However, it cannot be determined in what proportion financial resources will be made available by the European, federal, and provincial levels, especially since numerous funding allocations are co-financed by two or more levels. In the area of climate protection, however, the European Union tends not to provide direct funding, but to initiate programs that support environmental measures, thereby indirectly promoting climate protection.²⁸

In Tyrol, the importance of climate protection has also had an obvious impact at the administrative level. Although this topic is basically the responsibility of the respective departments (e.g., Department of Building and Regional Planning Law), a separate unit in the Tyrolean provincial administration that deals exclusively with climate protection topics and coordinates them internally (the Department of Regional Development) has recently been established. It should be noted that the respective departments in Tyrol have independent budgets, some of which are used for climate protection-related projects and subsidies. Thus, there is no unitary 'climate budget' in Tyrol, it is instead funded through the various budgets of all organizational units. In advance, the individual departments submit budget proposals in consultation

27 IntT_o8, IntV_o8.

28 See https://www.oesterreich.gv.at/themen/bauen_wohnen_und_umwelt/klimaschutz/Seite.1000400.html#EU.

TABLE 2
Tyrol

Domain	Funding	Funding description
energy and water	Promotion of innovative energy projects	Eligible projects stand out for their energy efficiency or represent a significant step towards the energy transition. In terms of energy efficiency and use of autochthonous energy resources (energy autonomy and energy transition/replacement of fossil fuels), they are exemplary and could initiate further comparable projects. As a consequence, experience is gained through concrete operation and a cost reduction is achieved in the long term. Technologically, these projects are impressive due to a high degree of innovation.
	Tariff subsidies for photovoltaic systems Promotion for small-scale agricultural hydraulic engineering installations	Subsidies for green electricity plants, i.e. the generation of green electricity from plants in Austria in accordance with the principles of European Union law. Improvement of production conditions through soil amelioration (i.e., drainage) and for measures to increase the performance or quality of crop production (i.e., irrigation).
transport	Promotion of energy-saving measures and renewable energy sources	Solar systems; thermal building renovation; heat pumps; energy saving in companies (heat recovery, heating optimization, lighting optimization, etc.); power generation in island locations (photovoltaic systems, small hydropower plants, wind turbines, etc.); vehicles with alternative drive systems and electric mobility; transport bikes.
	Grants for the construction of cycling, hiking and mountain paths with accompanying facilities	Cycle routes with accompanying facilities: hiking and mountain paths with accompanying facilities; renewal of cycle paths, hiking trails and mountain paths including accompanying facilities; visitor guidance and traffic management measures; rock climbing projects.

Domain	Funding	Funding description
	Rail infrastructure project	Funding is provided for investments in the infrastructure of Austrian Federal Railways (ÖBB) and private railways for the expansion of the public rail network.
	Tyrolean Mobility Program	The Tyrolean Mobility Program promotes mobility projects in municipalities, municipal associations and schools in Tyrol. The focus is on projects to strengthen the environmental alliance.
	National funding for regional development in Tyrol	The co-financing of Tyrolean project partners within the framework of the EU Structural Fund objectives 'rWB' (<i>Investitionen in Wachstum und Beschäftigung</i>), 'ETZ' (<i>Europäische Territoriale Zusammenarbeit</i>), 'LEADER/CLLD Axis' (<i>Liaisons entre Actions de Développement de l'Économie</i>) (Community-Led Local Development) includes a range of services as well as the national promotion of regional development and the Tyrol Volunteer Partnership.
	Programs to improve infrastructure in rural areas	The <i>Land</i> Tyrol grants a subsidy for infrastructural construction measures in rural areas, especially for the construction and renovation of public road facilities in permanently populated rural areas, in particular with the aim of developing agricultural holdings. In addition, aid is also granted for the construction of agricultural ropeways and the electrification or connection to the telephone network of agricultural farms. Applicants for subsidies may be individuals (agricultural enterprises), road communities, road interest groups and municipalities.
spatial planning	Funding from <i>Land</i> Tyrol for the development of strategies for planning associations	Funding is provided for the costs of developing projects relevant to spatial planning (spatial plans, guidelines, strategies, studies, and the like) at the planning association level, including the necessary inventories and analyses. Only planning associations may apply for and receive funding.

TABLE 3
Vorarlberg

Domain	Funding	Funding description
energy and water	Citizen participation for climate protection projects Residential renovation	This funding program is a measure within the framework of the "Energy Autonomy Vorarlberg" program. The aim is to promote the participation of citizens in projects relevant to climate protection. Funding is provided, for example, for the construction and expansion or even takeover of existing energy production plants based exclusively on renewable energy sources.
	Heat pump subsidy program	Funding is provided for installing a heat pump system or replacing an old heat pump with a new one. This applies to groundwater and geothermal heat sources, and exhaust air from domestic ventilation and outside air sources.
transport	Promotion of cycling routes	Granting of subsidies for the expansion and new construction of cycling routes. The aim is to connect and consolidate these cycle routes throughout the <i>Land</i> in accordance with the cycling strategy and the transport concept of the <i>Land</i> Vorarlberg and to increase the quality of cycling infrastructure and road safety.
	Electric vehicles in the public interest	The aim of this funding program is to save fossil energy sources and to reduce climate-relevant gases in the mobility sector through the use of exclusively electric vehicles for tasks in the public interest.
	E-charging infrastructure for existing multi-apartment buildings	The funding program aims at the retrofitting of apartment buildings with the basic requirements for the installation of charging infrastructure for e-cars and e-two-wheelers.
spatial planning	Energy-efficient building standards	Energy-efficient and ecological building in the Alpine region and in Central Europe is promoted by the two projects <i>ENERBUILD</i> and <i>CEC5</i> . In <i>ENERBUILD</i> , the partners developed measures to support energy-efficient building standards; <i>CEC5</i> used the knowledge generated to develop a transnational certification system for energy efficiency in public buildings (funded by the European Regional Development Fund).

with the responsible members of the government. After negotiations with the financial officers, a decision is then made on the amount of budget to be made available to the respective organizational unit. Against this background, there is no specific need to create or show a budgetary item designated as a 'climate budget', as there is no climate change organizational unit. On the other hand, this makes it practically impossible to illustrate the extent to which climate-related measures are financially supported by the *Land* Tyrol. However, Governor Günther Platter recently informed in a press release that an amount of 175.7 million euros have been earmarked solely for alternative forms of mobility in the budget for 2022 and 167.7 million euros for 2023.²⁹

Valuable insights into the extent of the funds used for climate protection are also provided by a report on the implementation of the Tyrolean climate protection and climate change adaptation strategy (2015–2020) recently published by the State Audit Office ('*Landesrechnungshof*').³⁰ According to the data provided by the various departments of the Tyrolean administration dealing with climate protection and climate change adaptation, Table 3 below shows the increasing importance of funding in climate-relevant sectors (2015 and 2020).

Unfortunately, no figures are available for the area of spatial planning and water management. According to the responsible departments, climate-related expenditures/fundings are not quantifiable.

A better overview of the diverse funding measures in the climate sector is to be made possible in the future through a recently passed amendment to the Tyrolean Funding Transparency Act.³¹ The law provides that subsidies granted by Tyrol should be digitally retrievable in real time and accessible to everyone. Based on this, subsidy reports should be elaborated, that can be viewed at the Office of the Tyrolean Provincial Government at one's own expense or free of charge in digital form on the Provincial website.³²

Concerning Vorarlberg, it was possible only to come up with one concrete figure with regard to the promotion of climate-relevant projects, which should, however, be viewed with reservation against the background of the problems already mentioned above. Including public transport, the Vorarlberg administration invests about 65 million euros per year, of which about 40 million

29 See <https://www.tirol.gv.at/meldungen/meldung/lh-platter-mit-doppelbudget-2022-2023-krise-entgegensteuern-dann-rueckkehr-zu-ausgeglichenem-budget/>.

30 See https://www.tirol.gv.at/fileadmin/landtag/landesrechnungshof/downloads/berichte/2022/Klimaschutz-_und_Klimawandelanpassungsstrategie.pdf.

31 The amendment to the Tyrolean Funding Transparency Act ('*Tiroler Fördertransparenzgesetz*') was passed in May 2022 but has not yet been announced.

32 See <https://www.tirol.gv.at/buergerservice/foerderungen>.

TABLE 4 *Land* Tyrol expenditures for climate protection and climate change adaptation measures 2015–2020 (amounts in thousands of euros)

Year/sector	2015	2016	2017	2018	2019	2020	2015–2020
energy, industry, economy and trade	1,468	2,637	1,971	2,507	2,227	1,852	12,561
transport ^a	21,568	24,269	21,031	18,664	23,668	28,609	138,812
agriculture	5,462	8,956	9,202	9,958	9,013	17,037	59,627
waste management	76	90	85	97	99	92	541
forestry	390	851	527	849	598	992	4,206
eco-systems and biodiversity	520	658	724	487	434	432	3,254 ^b
cross-sectoral measures	259	175	369	521	529	537	2,391

a However, this sum does not include the fundings for local public transport, which is mainly (co-)financed by the public sector. Local and regional passenger transport on rail and road was financed by the *Land* Tyrol for approximately 505.5 million euros in the period 2015–2020.

b This does not include the ÖPUL-nature conservation programme (Austrian Programme for the Promotion of Environmentally Sound, Extensive Agriculture that Protects the Natural Habitat) with costs of around 278,000 euros. These costs did not result from the ÖPUL subsidy premiums, but were incurred for subsidy advice to the farms.

euros are invested in ‘public transport’ and 25 million euros in energy subsidies (e.g., housing subsidies; air pollution control measures, etc.). Most of the energy subsidies are financed by the *Land* Vorarlberg, some are co-financed by the federal government and the EU. In local public transport, too, climate measures are mainly financed by the *Land* itself, but also supplemented by corresponding federal funds.³³

The majority of subsidies are standardized subsidy programs that affect a large number of individuals (e.g., replacement of heating systems). In the case of newer projects, some of the funding is also project-based. It is noteworthy that only a few projects in the area of climate protection are ‘newly invented’. Most are instead preexisting and are continuously adapted and expanded. For example, Vorarlberg is striving to electrify all buses used in local public transport. Fossil fuels are intended to become a remnant of the past.

The use of subsidies in Vorarlberg – similarly to Tyrol as mentioned above – is bound to certain subsidy guidelines and requirements, some of which even exceed EU standards. The administrative funding procedure is extremely heterogeneous and depends on the funding body (this may or may not be the *Land* alone). In some cases, compliance with the requirements is only checked by the *Land*, in others by external bodies that do not belong to the *Land* administration. Thus, administrative processes in the implementation of funding measures tend to be complex, especially when several levels of government or even external partners are involved. However, Vorarlberg’s efforts to make the region as climate-friendly as possible will be intensified in the future.

In a comparison between Tyrol and Vorarlberg in the area of climate-relevant funding policy, the following conclusions can be drawn:

1. Both Tyrol and Vorarlberg have recognized the importance of financial incentives to enable progress in climate-relevant sectors. This is reflected in high spending, especially in the area of local public transport.
2. Vorarlberg and Tyrol do not have a special ‘climate budget’. The different subsidies in this area are found in countless individual spending items of the respective departments, so that valid figures are hardly available.
3. Based on the climate strategies of both *Länder*, it can be expected that funding in climate-relevant areas will increase in the future.
4. Comparisons in the context of funding policy (amount and type of funding) are difficult not only because of the problems mentioned above, but also because the objects of comparison – in this case Tyrol and Vorarlberg – differ in many respects. As an example, one demographically

33 IntV_o8.

important difference should be pointed out: Tyrol has almost twice as many inhabitants as Vorarlberg³⁴ and therefore a higher state budget at its disposal.

3 Climate Change-Related Spending in Italy: The Case of the two Autonomous Provinces of Trento and Bolzano

3.1 *Preliminary Remarks and Context-Specific Issues*

Within the context of the general framework outlined at the start of this Chapter, this section provides an overview of the spending of the two Autonomous Provinces of Trento and Bolzano in the field of climate change, combining both quantitative and qualitative data.

In this regard, at least two limitations emerge from the outset and make this reconstruction if not impossible, at least partial and limited. A first constraint is of a temporal nature and is linked to the reform approved by the Italian government in 2011 on the harmonization of public accounting at all government levels. In accordance with articles 1 and 2 of L. 42/2009, the legislative frame of reference consists of D.lgs. 118/2011, as later amended. This harmonized accounting system applies to both ordinary and special regions, and as such was introduced by the two Autonomous Provinces of Trento and Bolzano from 2016. It consists of new accounting rules together with a new uniform classification of both revenue and spending throughout the country.³⁵ Regarding the environment, before 2016, related spending was classified under the function ‘territorial government’ for Trentino and mainly under the function ‘environmental protection’ for South Tyrol, whereas from 2016 onwards, mission 09 ‘sustainable development and protection of land and environment’ was introduced. This change concerned not only the name but also the content, i.e., the items of expenditure that can be allocated to one category or the other. For this reason, the year 2016 serves as a sort of watershed whereby data from previous years are no longer comparable with data from subsequent years.

A second restraint is of a substantial nature. Climate change is in fact not explicitly reflected either in the national or in the subnational budgets. It remains hidden ‘in the detail’ as there is no specific target on climate change. The heading ‘mission 09 – sustainable development and protection of land and environment’ includes expenditure for the administration and operation

34 Tyrol: 764,255 inhabitants (2022); Vorarlberg 401,607 inhabitants (2022).

35 See G. Rivosecchi, “L’armonizzazione dei bilanci degli enti territoriali: orientamenti e prospettive alla luce della giurisprudenza costituzionale”, *federalismi.it*, 17 (2016) 1–24.

TABLE 5 Province of Trento's Climate Change Fund, operating expenses (amounts in euros)

Year	Fondo cambiamento climatico Spese c/c – dirette, cap. 803560
2010	600,000
2011	350,000
2012	351,200
2013	140,000
2014	70,000
2015	320,000

SOURCE: MARTINA ANGARANO, *SERVIZIO SVILUPPO SOSTENIBILE E AREE PROTETTE*.

of activities and services related to the protection of the environment and the territory, natural resources, biodiversity (including sewage treatment plants). It gives evidence of the core spending in the environmental sector, i.e., all expenditure in which environment concerns represent the prevailing interest. However, environmental protection and climate change do not fully overlap or coincide. The latter can cover a segment of the former or might be an indirect objective of the first.

Another problem – as explained thoroughly in the Introduction above – is related to the fact that climate change policies are integrated within different sectoral policies in which climate change is in some cases a direct goal, while in others it is only an indirect consequence of the exercise of activities aimed at satisfying other primary interests. The same dynamic is fully reflected on the expenditure side.³⁶

The only exception to this complex pattern is the Climate-Fund (*Fondo sul Clima*) established in Trentino by L.P. 5/2010. This is the only financial instrument specifically targeted at climate change. Table 4 above outlines the funding earmarked solely for climate change up to 2015 (1,831,200 euros).

Since 2016, this fund has been merged into the Fund for Sustainable Development and Climate Change (*Fondo per lo sviluppo sostenibile e la lotta ai cambiamenti climatici*). Table 5 below shows the resources allocated to this second fund overall from 2010 to 2021.

³⁶ IntBZ_01, IntBZ_05, IntBZ_06, IntBZ_07.

TABLE 6 Province of Trento's Fund for Sustainable Development and Climate Change, operating expenditure and contributions (amounts in euros)^a

Year	Fondo sviluppo sostenibile Spese c/c – dirette, cap. 803550-001	Fondo sviluppo sostenibile Spese c/c – contributi, cap. 803550-002
2010	973,000	2,614,960
2011	695,000	1,696,400
2012	1,300,315	1,948,000
2013	547,000	820,000
2014	237,500	410,000
2015	323,000	50,000
2016	230,000	70,000
2017	165,000	210,538
2018	225,500	1,177,571.50
2019	120,000	1,000,000
2020	225,200	770,600
2021	150,000	601,600

SOURCE: *IBID.*

A large proportion of resources from this fund has been used over the years to finance climate-related initiatives, such as the provincial roundtable for climate change coordination and action (*‘Tavolo provinciale di coordinamento e di azione sui cambiamenti climatici’*), the Trentino Observatory (*‘Osservatorio Trentino’*). At the same time data show that allocated funds have decreased, also due to the economic crisis-related overall reduction in public spending. However, the structure of the provincial budget does not allow clarification as to whether climate-related spending has increased within other sectors.

3.2 *Grassroots Evidence of the Cross-sectoral Nature of Climate Change Spending*

In both Provinces, the way tasks and functions in climate-related sectors are distributed is also reflected in the allocation of resources across the provincial administration and results in several administrative departments or agencies being vested with responsibility for granting subsidies to individuals and/or companies. Among these administrative structures, the provincial Agency for environment and climate protection (hereinafter Environment Agency)

in Bolzano³⁷ and the provincial Agency for environmental protection in Trentino³⁸ are those with the most visible link to climate change issues. The Civil Protection (*Protezione Civile*) instead is responsible for dealing with catastrophic events, e.g., danger zone plans.³⁹ If the climate purpose is predominant (together with environmental protection) in the case of the Environment Agencies, there are many other administrative subdivisions/provincial agencies that in the exercise of their functions indirectly deal with climate change, with other purposes being either prevalent or at least more visible. This justifies the attraction of the related expenditure under different missions of the provincial budget. Landscape planning and protection, energy, and public transport are all sectors of relevance in this respect.⁴⁰ The same applies to the Provincial Water and Energy Agency in Trentino, or the Casa Climate Agency and the Green Mobility Initiative in South Tyrol: climate protection is not their priority, but this is achieved through the implementation of policies within their respective competences.⁴¹

3.3 *Spending Structure and Related Decision-Making*

The funds allocated to each administrative subdivision/agency are transfers from the provincial budget. The budgetary rule is that spending is covered by the general provincial revenues, albeit with some exceptions, for example in the case of water charges. Pursuant to L.P. 10/2019 (South Tyrol), from 2020 onwards 50% of funds from water charges are earmarked to improve the quality of watercourses, with the remaining 50% allocated to optimize water installations. All in all, these can be considered adaptation measures to combat the effects of climate change. The total amount obviously depends on the revenue collected, which from 2023 on is estimated to amount between 3 and 4 million euros per year.⁴² In the case of the Province of Trento, instead, the rules are contained in L.P. 14/2020 and in the relevant implementing regulation (Decree of the President of the Province 16 December 2021, No. 21-55/Leg). By linking the payments to the principle of proportionality, the new provisions should contribute to the optimal use of water resources.

The priorities and the amounts transferred to the different fields/agencies are defined by each provincial executive after consultation with all sectoral

37 Referred in the rest of the book also as APPA Bolzano.

38 Referred in the rest of the book also as APPA Trento.

39 IntBZ_01.

40 IntBZ_01, IntBZ_05, IntBZ_07.

41 IntBZ_03, IntBZ_05.

42 IntBZ_06.

departments. There are several documents that guide spending decisions in general and that – given the central and transversal nature of climate change issues – also influence the spending therein. Of these, the Provincial Economic and Financial Document (DEFP) and its Update Note (NADEFP) play a central role in linking policy and budget.⁴³ The DEFP, to be adopted by 30 June each year, defines the objectives of the provincial budget maneuver, is general in nature and programmatic in content, and supports the budgetary planning process. In particular, it contains the programmatic lines of government action for the period included in the budget, which are considered as necessary for the development objectives of the territory. It is divided into two sections: the first contains an overview of the economic-financial context, of the policies to be adopted, and of the public finance objectives; the second describes the financial framework with regard to the resources available for reaching the provincial planning objectives, specifying the implementation tools to be used for the reference period. The NADEFP, to be adopted every year in autumn by the provincial executive and subsequently presented to the provincial council, together with the budget bill, includes an updated analysis of the economic and social context and the framework of provincial public finance of the DEFP in light of the changed context, specifying the objectives together with the actions planned, thus linking policies and resources in a clear way. These are however general-purpose documents that are complemented with more targeted ones. In Trentino, these are the scoping paper “*Trentino Clima 2021–2023*”, which sets out the work program on the basis of which the provincial strategy for mitigation and adaptation to climate change is adopted (“*Strategia Provinciale di Mitigazione e Adattamento ai cambiamenti climatici*”), together with the provincial strategy for sustainable development (“*Strategia provinciale di Sviluppo Sostenibile – SproSS*”); in Bolzano, the Climate Strategy-South Tyrol Energy 2050 (“*Piano Clima-Energia Alto Adige 2050*”, now amended by *Piano clima Alto Adige 2040*) of 2011.

The dedicated resources are then distributed among the various departments/agencies and from here they are then partly used for operating expenses and partly allocated to individuals and businesses based on criteria and objectives set by the provincial executive.⁴⁴ The most common measures

43 These are available at the following links: <https://www.provincia.tn.it/Documenti-e-dati/Documenti-di-programmazione-e-rendicontazione/Documenti-di-economia-e-finanza-provinciale-DEFP-e-relative-Note-di-aggiornamento-NADEFP-per-la-XVI-Legislatura> for the Autonomous Province of Trento; <https://www.provincia.bz.it/amministrazione/finanze/bilancio-rendiconto/bilancio-2020-2022.asp> for the Autonomous Province of Bolzano.

44 IntBZ_12.

in climate-relevant fields are grants to individuals or enterprises, but also tax benefits. Over the last ten years, for instance, the Environment Agency of Bolzano has allocated on average ten million euros per year, divided between renewable energy sources, district heating and energy efficiency. The budget has remained fairly stable over time thanks to the attention shown by politicians to these issues.⁴⁵

Beyond that, as mentioned above, there are also other resources, such as subsidies in the transport sector (e.g., electric car bonus or other mobility bonuses). For instance, the interviews have revealed that one of the most heavily funded sector is public transport. Energy is another area in which both Provinces invest greatly. Numerous biomass and district heating plants have been financed,⁴⁶ and public-private hydroelectric power plants have been set up.⁴⁷ Only the municipality of Bolzano uses incinerators, while for instance all other South Tyrolean municipalities use biomass (though mostly imported). This also shows a focus on climate issues.

Other sectors such as building, agriculture and mobility are also important. Examples in this respect are the incentives for heat pumps and photovoltaic systems (in South Tyrol these have been increased from 50 to 80% in terms of numbers), and electric mobility incentives.⁴⁸ Also, the residents of the two Provinces can access both national and provincial contributions.⁴⁹ In fact, individuals and companies located in these territories are also entitled to national subsidies like all Italian citizens.⁵⁰

Significant resources also come from the European Union. In the Province of Bolzano, for instance, European funds are managed by the provincial administration and not by the Environment Agency. In relation to these, however, the Environment Agency offers technical advice for the evaluation of projects.⁵¹ Besides the availability of funds, the EU has in general a positive impact at the subnational levels. On the one hand, in most cases European funding requires co-financing by the receiving authority, on the other hand, both Provinces follow the European trend whereby richer territories tend to spend more on

45 *Ibid.*

46 IntBZ_04.

47 For more info on the latter: see The Provincial Environmental Energy Plan (PEAP) 2021–2030 at <http://www.energia.provincia.tn.it/peap/>; and also <https://www.consiglio.provincia.tn.it/news/giornale-online/articoli/Documents/Slide%20Placidi.pdf>.

48 IntBZ_07.

49 *Ibid.*

50 IntBZ_12.

51 *Ibid.*

environmental-oriented policies.⁵² The same shift from environmental protection to climate change strategy has taken place following impulses from the European level. Energy and climate planning are at the core of the Member States' EU obligations, and this has a knock-on effect at the provincial level.⁵³

3.4 *A Comparative Analysis of Provincial Data*

Because of the above-illustrated sectoral fragmentation, it is not possible to give a comprehensive account either of the total expenditure for climate protection, or of its evolution over time. However, an analysis of the time projection of environmental expenditure allows us to trace the trends in the two Provinces, in comparison to one another as well as to the other Italian regions.

In this respect, the '*Conti Pubblici Territoriali*' database (hereinafter CPT database) is of interest because it allows for a comparison between the two Provinces, as well as with the other regions. The database regionalizes expenditure, including that of the state in the various regions. Of interest is environment function No. 14, which contains data distributed on three levels: state, provincial and local (Table 6 below).

Some interesting considerations can be made on the basis of the data provided in Table 6 below, especially of a comparative nature. First, if one observes the data for the year 2000 it emerges that the total expenditure in the Province of Trento was three times higher than that of the Province of Bolzano, whereas the gap has almost closed based on 2019 data, showing the importance of environmental matters for both entities.

A second interesting aspect is related to the ratio of subnational-plus-local to national spending.⁵⁴ The latter starting from 2001 onwards has always been marginal in both Provinces. For instance, in the year 2005 it amounted to 4.87 million euros, which is 3.24% of the overall expenditure in the field, whereas in 2018 it was 1.56 million euros, which is only 1.23%. An even smaller contribution from the central administration is found in the Province of Bolzano, where the central government expenditure was 1.88 million euros in 2005 and 1.81 million euros in 2018, which is respectively 2.50% and 1.44% of the total expenditure.

As useful as these data are, by offering only consolidated data, the CPT database offers the advantage of showing the total environmental expenditure in a

52 IntBZ_04.

53 IntBZ_11.

54 The choice to consider subnational and local spending together is because local finance is a primary responsibility of the provincial government. This applies to both Autonomous Provinces.

TABLE 7 Consolidated spending per administration, sector 00014 environment, values in million euros

Unit	Administration	2000	2005	2010	2015	2016	2017	2018	2019
PROVINCE OF TRENTO	CENTRAL	15.83	4.87	2.77	2.81	2.51	2.36	1.56	2.42
	LOCAL	15.44	76.18	99.87	94.77	109.33	64.23	67.30	76.84
	REGIONAL	60.95	69.07	72.96	64.75	66.30	63.73	58.14	69.02
Total		92.22	150.12	175.60	162.34	178.15	130.33	127.00	148.28
PROVINCE OF BOLZANO	CENTRAL	3.96	1.88	1.88	1.03	1.77	2.02	1.81	2.20
	LOCAL	11.80	48.74	46.34	50.84	55.28	48.67	49.89	49.70
	REGIONAL	21.97	24.44	19.12	20.28	47.15	52.92	73.97	86.72
Total		37.73	75.06	67.34	72.16	104.20	103.61	125.67	138.63

SOURCE: THE DATA ARE TAKEN FROM THE CPT DATABASE, [HTTPS://WWW.AGENZIACOESIONE.GOV.IT/SISTEMA-CONTI-PUBBLICI-TERRITORIALI/DATI/](https://www.agenziacoazione.gov.it/sistema-conti-pubblici-territoriali/dati/).

given territory, but not that precise segment that is the direct representation of the political autonomy of the entity of concern. This can only be seen through a reading of the respective provincial budgets, which, following the now completed harmonization process, may offer comparable data from 2016 onwards. These are shown for both Provinces in Table 7 below.

From a comparative observation of the data provided for each Province in Table 7, two major observations emerge. First, in both Provinces environmental spending increased considerably from 2016 to 2020. It almost doubled in the case of Trentino, while it grew more than twice as fast in South Tyrol. For Trentino indeed the increase may also be related to costs associated with the Vaia storm that severely hit this territory back in 2018. Second, South Tyrol spends more in this area when compared to Trentino. Nevertheless, these considerations should not lead to hasty conclusions considering that in any case for an effective understanding, the figures should be related to the total spending for each of the years under consideration. Only in this way could one have an idea of the relative weight of the spending in this area made by each Province. Nonetheless, even such information would not provide a clear evidence of the phenomenon under consideration, since as mentioned several times throughout this Chapter, we are dealing in any case with the environment and not with climate change, and only a part of the expenditure related to the latter area flows into mission 09, being a substantial and non-quantifiable part spread among multiple sectors and frequently realized only indirectly, that is, through the financing of activities that formally and/or predominantly pursue other purposes rather than climate change adaptation or mitigation.

4 Concluding Remarks: Where We Stand and the Challenges Ahead

The central sections devoted respectively to the Austrian *Länder* and the Italian Autonomous Provinces confirm the difficulties described in the opening section and the impossibility of providing a quantitative and not just a qualitative analysis of climate change-related spending in the four sub-national governments of concern. *A fortiori*, these limitations make it impossible to make a comparison of the collected data that goes beyond the borders of the single country.

From a qualitative point of view, though, the four systems show common traits and trends. First, climate change is among the top priorities on the political agenda in all four cases. Despite the difficulties in specifically defining the extent of climate change funding, all show a steady path of improvement in their main environmental, territorial and energy planning documents, as

TABLE 8 Provincial spending, mission 09 'sustainable development and protection of land and environment', absolute values

	Province of Trento	Province of Bolzano
2016	62,210,744.21	65,194,691.63
2017	60,777,733.15	89,576,043.38
2018	92,270,851.47	136,299,064.79
2019	107,275,386.37	129,229,482.55
2020	110,609,768.87	144,197,121.05

SOURCE: THE DATA ARE TAKEN FROM THE BUDGETS OF THE TWO AUTONOMOUS PROVINCES (FINAL ACCOUNTS).^a

^a The documents are available at: https://trasparenza.provincia.tn.it/pagina731_bilancio-preventivo-e-consuntivo.html (for trento); <https://www.provincia.bz.it/amministrazione-trasparente/bilancio-preventivo-consuntivo.asp> (for bolzano).

well as in the programming documents for European resources approved to date and are committed to keeping this approach also with reference to the programming documents to be adopted in the near future. However, in all cases action is coordinated mainly at the political level, i.e., in planning documents, while its practical implementation at the administrative level still lacks transparency and is difficult to reconstruct, especially if the different levels of government are taken into account. In the long run, this could be a major problem considering that the uncontrolled multiplication of actions and initiatives could eventually result in unnecessary overlapping, wasting of resources and inefficiencies.

A dedicated climate change expenditure item in subnational budgets would help in this respect. This is not only a matter of giving emphasis to an issue that must necessarily be key to upcoming public policies, but also of allowing the political statements to be translated into concrete initiatives and of enabling the impact of these actions – including the economic impact – to be assessed in the appropriate fora. This should ensure that the financial resources made available are used in the best possible way to prevent and mitigate the negative impacts of climate change.

This is all the more relevant in a field like climate change, in which responsibilities of the different levels of government frequently intersect. Transparency on the budget side would in this case help prevent wasteful overlaps, while emphasizing the need for inter-governmentally coordinated actions.

Dedicated climate funds would not only facilitate vertical and horizontal comparability of funding – i.e., among the different levels of government as well as among the different entities of the same level –, they would also have a pro-competitive effect. Territorial entities that spend less on climate protection in the form of subsidies would at least have to justify this to the public and their citizens, as well as to the other regions due to the positive and negative spill-over effects typically associated with climate change issues.

Besides all that, the need to adopt an innovative and multidimensional vision over the subject, which is capable of anticipating, also at the political and administrative level, strategic responses to the critical issues on the horizon, emerges strongly. There are documents at all levels of government designed for this purpose. However, these are mostly policy documents that need further measures to be translated into concrete actions. This notwithstanding, the various legal requirements (for example, obligations at the EU level or the fact that climate protection is constitutionally entrenched in the Provincial Constitutions of Tyrol and Vorarlberg as well as in the Italian Constitution) already oblige political decision-makers to take active steps in this area. The climate strategies of the investigated Austrian *Länder* and Italian Autonomous Provinces show great effort in this direction. As such, the importance of dedicated climate funds should therefore not be overestimated as long as the territorial entities are well aware of their vital role in combating climate change, even though there is still a long way to go.

Information and Participation in Climate Change Integration

Martina Trettel, Melanie Plangger and Franz Koppensteiner

1 Introduction¹

This Chapter aims to investigate the role of information and public participation in the integration of climate change policies in subnational entities. The two Austrian *Länder* Tyrol and Vorarlberg and the two Italian Autonomous Provinces of Trento and Bolzano serve as case studies.

Information relates to the extent to which climate change-related data and analyses are accessible and effectively communicated by policymakers and public bodies to the public, especially stakeholders participating in decision-making or implementation. Climate change integration could, for instance, be hindered by a lack of understanding in society of the consequences for climate change of their respective actions.

Information is thus an essential precondition for strong and effective public participation. Therefore, the Chapter also focuses on the organization of participation and its contribution to climate change integration through the inclusion of relevant expertise and the creation of common understanding processes. Public participation implies interaction between organized and non-organized civil society and public authorities. The Chapter analyses voluntary modes of participation, which are used by policymakers on an ad hoc basis, together with binding, legally required procedures, where present.

To address these issues, the Chapter adopts a socio-legal methodology, based on document analysis, interviews, literature review and a comparative approach between the two Italian Provinces and the two Austrian *Länder*.

The first section examines the accessibility to information held by public authorities – in other words information mechanisms – in Tyrol, Vorarlberg and in the Autonomous Provinces of Trento and Bolzano and distinguishes between binding i.e. legally required and voluntary i.e. non-legally required information mechanisms. The second section investigates participation

¹ The opinions expressed in this contribution are the authors' alone. The contribution was submitted in May 2022; later developments were not taken into account.

procedures in the four sub-national entities under scrutiny. Legal procedures that give stakeholders and affected persons rights to comment, object and seek judicial review contrast with voluntary participation in policy development that gathers inputs, expertise, and feedback or stimulates deliberative understanding among citizens. The final section summarizes the results and draws conclusions.

2 Information and Climate Change Integration

2.1 *Information Mechanisms in Tyrol and Vorarlberg*

2.1.1 Binding Information Mechanisms

For a long time, the principle of official secrecy characterized the Austrian administration. It was only in 1987 that the administration was obliged to provide information pursuant to the Constitution (hereinafter *Bundes-Verfassungsgesetz* or B-VG),² as illustrated below.³ Since then, both concepts – official secrecy and the duty to provide information – have been in tension with each other, and this has not been fully resolved to date.

According to article 20(4) B-VG, the duty to provide information provides that

[a]ll organs entrusted with *Bund*, *Land* and municipal administrative duties as well as the executive officers of other public law corporate bodies shall impart information about matters pertaining to their sphere of competence in so far as this does not conflict with a legal obligation to maintain confidentiality.

The obligation to provide information thus addresses the administration and includes both sovereign and private sector administration; it does not apply to the judiciary or to legislation.⁴

According to the case law of the Constitutional Court (hereinafter *Verfassungsgerichtshof* or VfGH), the duty to provide information is not

2 *Bundes-Verfassungsgesetz* – B-VG StF: BGBl. No. 1/1930.

3 A. Forster, “Art. 20 B-VG”, in A. Kahl, L. Khakzadeh, S. Schmid (eds.), *Kommentar zum Bundesverfassungsrecht* (Jan Sramek Verlag 2021) 444–465, para. 26.

4 P. Bußjäger, “Der Status quo: Amtsverschwiegenheit und Informationsrecht”, in M. Bertel, E. Happacher and A. Simonati (eds.), *Die transparente Verwaltung in Österreich und Italien. Der Zugang zur Information zwischen Grundsätzen und Anwendung* (New Academic Press 2019) 43–55, at 45.

equivalent to a constitutionally protected fundamental right.⁵ It is questionable to what extent the VfGH still upholds this opinion today. This is all the more true since the European Court of Human Rights (hereinafter ECtHR) has recently derived a right of access to state-held information from article 10 of the European Convention on Human Rights (hereinafter ECHR).⁶

Pursuant to the wording of article 20(4) B-VG, the limits of the duty to provide information result from “legal obligation[s] to maintain confidentiality”. These confidentiality obligations include the official secrecy enshrined in article 20(3) B-VG,⁷ the fundamental right to data protection,⁸ and selected provisions of laws adopted by simple majority,⁹ in particular § 1(2) of the Duty to Grant Information Act (hereinafter *Auskunftspflichtgesetz*),¹⁰ according to which “[i]nformation shall be given only or to an extent which does not substantially impair compliance with the other duties of the administration [and the information] is obviously [not] requested in a frivolous way”.

The obligation to provide information is not uniformly structured in Austria. The *Auskunftspflichtgesetz* applies only to requests for information addressed to federal bodies. Accordingly, each *Land* has to provide for corresponding

5 VfSlg. 12.838/1991; according to the VfGH article 20(4) B-VG is rather to be seen as a constitutional order to provide for a subjective right of access to state held information at the level of ordinary legislation.

6 ECHR (Rome, 4 November 1950, in force 3 September 1953). In its (leading) *Magyar Helsinki Bizottsag* decision, the ECtHR identified four criteria that are relevant for determining a right of access to information under article 10 ECHR. These include the purpose of the information request, the nature of the information sought, the role of the applicant, the existence of ready and available information. See further ECtHR 8 November 2016, *Magyar Helsinki Bizottság v. Hungary*, Application No. 18.030/11, paras. 158ff.; see also F. Koppensteiner, “Unionsrechtliches Dokumentenzugangsrecht und staatliche Informationsfreiheit: Zwei Parallelen, die sich niemals treffen?“, *Die Öffentliche Verwaltung*, 1 (2022) 21–28, at 22.

7 Article 20(3) B-VG reads as follows: “All functionaries entrusted with federal, provincial and municipal administrative duties as well as the functionaries of other public law corporate bodies are, save as otherwise provided by law, pledged to confidentiality about all facts of which they have obtained knowledge exclusively from their official activity and which have to be kept confidential in the interest of the maintenance of public peace, order and security, of comprehensive national defense, of external relations, in the interest of a public law corporate body, for the preparation of a ruling or in the preponderant interest of the parties involved (official confidentiality)”. The grounds for official secrecy – i.e., “maintenance of public peace, order and security” and the like – are to be interpreted in the light of article 10(2) ECHR.

8 R. Feik, “Art. 20(3) B-VG”, in B. Kneihls and G. Lienbacher (eds.), *Rill-Schäffer-Kommentar Bundesverfassungsrecht* (Verlag Österreich 2007), para. 5.

9 P. Bußjäger and J.A. Egger, “Verfassungs- und verwaltungsrechtliche Grundlagen staatlicher Krisenkommunikation”, *Österreichische Juristen-Zeitung*, 8 (2021) 63–71, at 66.

10 *Auskunftspflichtgesetz* StF: BGBl. No. 287/1987.

rules on the basis of the so-called Fundamental Act on the duty to grant information (hereinafter *Auskunftspflicht-Grundsatzgesetz*).¹¹ The *Auskunftspflicht-Grundsatzgesetz* ensures that there are no major divergences between the information rules of the *Länder*. Besides the information rules of the *Länder* strongly resemble the federal *Auskunftspflichtgesetz*.

As a matter of fact, similarly to § 3 of the *Auskunftspflichtgesetz*, the Tyrolean Duty to Grant Information Act provides for a period of eight weeks to respond to written requests for information, should it not be possible to provide the information orally or by telephone. If information is not granted, a decree motivating the decision not to grant access to information shall be issued on the request of the applicant.¹² The Vorarlberg Duty to Grant Information Act provides for a similar procedure.¹³ Since both the Tyrolean and the Vorarlberg Duty to Grant Information Act apply generally to requests for information, they can be considered as means of obtaining climate-relevant information.

EU law also partly influences the national right of access to information. The Environmental Information Directive,¹⁴ issued on the basis of the Aarhus Convention,¹⁵ provides for a right of access to environmental information held by public authorities. Environmental information is broadly understood as all information relating to the environment.¹⁶ In this sense, information relevant to climate may also be regarded as environmental information. The Environmental Information Directive was implemented in Austria at the federal level by the Environmental Information Act (hereinafter *Umwelthinformationsgesetz* or UIG)¹⁷ and at the level of the *Länder* by supplementing existing Duty to Grant Information Acts or, as in Tyrol and Vorarlberg, by separate *Länder*- Environmental Information Acts.¹⁸

In sum, the information mechanisms described so far, are referred to as reactive mechanisms, as one needs to actively request the information. Individuals,

11 *Auskunftspflicht-Grundsatzgesetz* StF: BGBl. No. 286/1987.

12 *Tiroler Auskunftspflichtgesetz* StF: LGBl. No. 4/1989, § 4.

13 *Auskunftsgesetz* (Vorarlberg) StF: LGBl. No. 17/1989, § 3 and 4.

14 Directive 2003/4/EC of the European Parliament and of the Council of 28 January 2003 on public access to environmental information and repealing Council Directive 90/313/EEC, OJ L 041, 14.02.2003, 26–32.

15 United Nations Economic Commission for Europe (UNECE) Convention on Access to Information, Public Participation in Decision-Making and Access to Justice in Environmental Matters, adopted at Aarhus, Denmark on 25 June 1998, entered into force 30 October 2001, ECE/CEP/43 (also referred to as Aarhus Convention).

16 See article 2(1) of the Directive 2003/4/EC.

17 *Umwelthinformationsgesetz* – UIG StF: BGBl. No. 495/1993.

18 See e.g. *Landes-Umwelthinformationsgesetz* (Vorarlberg) – L-UIG StF: LGBl. No. 56/2005 and *Tiroler Umwelthinformationsgesetz 2005* – TUIG 2005 StF: LGBl. No. 89/2005.

who unlike non-governmental organizations (hereinafter NGOs), journalists and other “public watchdogs”,¹⁹ are not professionally organized may perceive this as an obstacle. This obstacle could be overcome by proactive information mechanisms, which are not based on a (formal) information request. In this context “proactive” simply means that public bodies are required to provide and disseminate information about their main activities so that the public can participate in public matters.

At the current time no constitutional obligation to proactively inform the population about climate change can be derived from article 20(4) B-VG. Yet this is likely to change if the ministerial draft for a new article 22a B-VG in conjunction with a new Freedom of Information Act enters into force.²⁰ The ministerial draft both replaces official secrecy by a constitutional right of access to information, and obliges public bodies²¹ to publish information of general interest²² via a central information metadata register.²³ The obligation to publish information is especially relevant for information regarding climate change, since it may be considered information of general interest.

Apart from the ministerial draft, an obligation to proactively inform the population may arise in particular from articles 2, 8 and 10 ECHR. Indeed, fundamental rights provide not only for negative but also for positive state obligations.²⁴ For example, in the light of the *Guerra* case,²⁵ the obligation to inform neighbors of an industrial plant about possible dangers associated with the plant or to provide comprehensive information in the event of an accident can be derived from article 8 ECHR. Such obligations come into play above all

19 Concerning “public watchdogs” see also ECtHR 8 November 2016, *Magyar Helsinki Bizottság v. Hungary*, Application No. 18.030/11, marginal No. 165 *et seq.*

20 See https://www.parlament.gv.at/PAKT/VHG/XXVII/ME/ME_00095/index.shtml. All Internet sources in this contribution were accessed on 31 March 2022; there is no concrete timetable for the entry into force of the draft, as political agreement on the key points of the project is still lacking.

21 The responsible state actors are e.g. the legislative bodies, the administrative bodies including the bodies entrusted with the management of federal administration and state administration business, the bodies of ordinary jurisdiction, etc.; see also § 4 of the draft Freedom of Information Act.

22 Information of general interest is defined in § 2(2) of the draft Freedom of Information Act as “information that concerns or is relevant to a general group of persons, in particular studies, expert opinions, statements and contracts with an object value of at least 100,000 euros”.

23 F. Lehne and P. Weismann, “Auf dem Weg zur Informationsfreiheit?”, *Österreichische Juristen-Zeitung*, 22 (2021) 1022–1029, at 1025.

24 F. Koppensteiner, “Transparenz im Unionsrecht, ein Überblick”, in M. Bertel *et al.* (eds.), *Die transparente Verwaltung*, *supra*, 1–39, at 17ff.

25 ECtHR 19 February 1998, *Guerra and others v. Italy*, Application No. 116/1996/735/932.

when the threat to the fundamental right has become so clear that the state has a duty to act. In view of the increasingly dramatic consequences of climate change, it is only a matter of time until information obligations relating to climate change aspects will be derived from articles 2, 8 and 10 of the ECHR.

In addition to the B-VG and the ECHR, proactive mechanisms can also arise from the constitutions of the *Länder*. Article 60a of the Tyrolean constitution (hereinafter *Tiroler Landesordnung 1989*)²⁶ stipulates that “the *Land* government shall inform the population of the *Land* in an appropriate manner about matters of particular political, economic or financial importance for Tyrol”.²⁷ Although article 60a of the *Tiroler Landesordnung 1989* does not explicitly address climate change issues, these can be subsumed under matters of political, economic and financial importance for Tyrol. Admittedly, the *Land* government has wide discretion in this regard; moreover, unlike articles 2, 8 and 10 ECHR, article 60a of the *Tiroler Landesordnung 1989* is not a subjective right (that can be invoked before a court), but an objective guideline to be observed by the government of Tyrol. Unlike the Tyrolean constitution, the constitution of Vorarlberg²⁸ has no comparable proactive information mechanisms.

At the level of ordinary legislation, proactive information mechanisms appear in the UIG and the *Länder*- Environmental Information Acts. Under § 9 UIG, “bodies required to provide information shall prepare environmental information relevant to their functions and held by or for them for active and systematic dissemination to the public”. In particular, public bodies shall disseminate international treaties, policies, plans and programs related to the environment, as well as environmental status reports and permits that have a significant impact on the environment.²⁹ Similar provisions exist in § 9 of the Tyrolean Environmental Information Act 2005³⁰ as well as in § 9 of the Vorarlberg State Environmental Information Act.³¹ In parallel, additional proactive mechanisms exist in a number of specific policy areas, for example in the national water management plan³² or water management framework

26 *Tiroler Landesordnung 1989* StF: LGBl. No. 61/1988.

27 P. Bußjäger and J.A. Egger, “Verfassungs- und verwaltungsrechtliche Grundlagen”, *supra*, at 69.

28 *Landesverfassung (Vorarlberg)* StF: LGBl. No. 9/1999.

29 See § 9(2) UIG.

30 *Supra* note 17.

31 *Supra* note 17.

32 See *Wasserrechtsgesetz 1959 – WRG. 1959*. StF: BGBl. No. 215/1959, § 55(c) und 55(h).

plans³³ to be drawn up on the basis of the 1959 Water Act, and in spatial planning plans under the relevant laws of the *Länder*, among others.³⁴

All in all, proactive information mechanisms are gaining importance, especially in recent years. In contrast to reactive information mechanisms, they have two major advantages: first, they facilitate the accessibility of relevant information in the absence of a request; second, they facilitate the work of public bodies, since these bodies will presumably be confronted with fewer individual requests for information overall and, if they are confronted with such requests, they can ideally refer to information that is already accessible.

2.1.2 Voluntary Information Mechanisms

Binding information mechanisms are accompanied by several voluntary information mechanisms. Their aim is either to raise awareness of climate-related measures amongst the relevant stakeholders or to disseminate climate-relevant information. In general, voluntary information mechanisms in Tyrol and Vorarlberg can be subdivided into general climate strategies, which set general targets, and policy area specific climate initiatives.

Both Tyrol and Vorarlberg have defined general climate strategies. Tyrol, for example, publishes a regularly updated climate report.³⁵ The report is a result of continuous consultation among the departments of the government responsible for the implementation of climate related sectoral measures. The starting point for this report was 2012, when the Tyrolean government adopted its first sustainability strategy. In 2014, the Tyrolean government committed to energy independence by 2050 and a move away from the use of fossil fuels.³⁶ Essentially, the goal of Tyrol's sustainability and climate strategy is to "drive forward an ecologically compatible, socially just and economically efficient development" of the *Land*.³⁷ The Tyrolean sustainability and climate strategy is backed up by continuously updated status reports on the implementation of

33 See § 53 WRG. 1959.

34 See *Tiroler Raumordnungsgesetz 2016* – TROG 2016 StF: LGBl. No. 101/2016, § 12; *Gesetz über die Raumplanung (Vorarlberg)* StF: LGBl. No. 39/1996, § 11.

35 *Leben mit Zukunft. Tiroler Nachhaltigkeits- und Klimastrategie*, Innsbruck, September 2021; see also https://www.tirol.gv.at/fileadmin/themen/landesentwicklung/raumordnung/Nachhaltigkeit/Nachhaltigkeits-_und_Klimakoordination/Publikationen/Nachhaltigkeits-und-Klimastrategie_2021.pdf.

36 *Ibid.*, at 5.

37 The strategy identifies six fields of action that include the areas of energy and climate protection, mobility and infrastructure, buildings and regional planning, economy and regional development, climate change adaptation and, finally, state administration as a role model.

the strategy such as the Tyrol Energy Monitor³⁸ and the Tyrol Climate Progress Report.³⁹

Vorarlberg established Energy Autonomy Vorarlberg as its central climate-related policy goal in 2009. It aims to cover the regional energy demand completely with renewable energy by 2050. An evaluation of the efforts resulted in the Energy Autonomy + strategy.⁴⁰ However, Energy Autonomy +, which is primarily concerned with reducing greenhouse gas emissions, constitutes only one of three pillars of Vorarlberg's climate strategy. In addition, there is the "land use" pillar, which provides for the conservation of natural carbon reservoirs (such as peatlands), and the "climate change adaptation" pillar, which deals with the inevitable need to adapt to climate change.⁴¹

Classic websites serve as a means of disseminating these general climate strategies. The website "*Tirol 2050/Tirol Energieautonom*"⁴² for Tyrol and the websites "*Energieautonomie*"⁴³ and "*Klimawandelanpassung – Infoportal*"⁴⁴ for Vorarlberg deserve special mention in this regard. Overall, sufficient information on climate change is publicly available. Civil society actors confirm that public bodies are cooperative and generally make relevant information accessible.⁴⁵

Apart from general climate strategies, Tyrol and Vorarlberg have launched policy area-specific climate initiatives. Most of these initiatives are part of the existing umbrella strategies of the *Länder*.

The governments of Tyrol and Vorarlberg frequently organize information and awareness-raising initiatives on a project basis with different target

38 *Tiroler Energiemonitoring 2019. Statusbericht zur Umsetzung der Tiroler Energiestrategie*, (Land Tirol 2020); see also https://www.tirol.gv.at/fileadmin/themen/umwelt/wasser/wasserrecht/Downloads/20-05-29_ENERGIEMONITORING-2019.pdf.

39 *Klimafortschrittsbericht Tirol 2021*, (Land Tirol 2021).

40 *Strategie Energieautonomie + 2030. Klimaschutz in Vorarlberg umsetzen*, (Land Vorarlberg 2021); see also <https://www.energieautonomie-vorarlberg.at/zoolu-website/media/document/3817/Strategie+Energieautonomie%2B+2030>. The interim goals of this strategy are to achieve a 50% increase in the share of renewable energy sources by 2030 compared with 2005, a 50% reduction in greenhouse gases compared with 2005, and 100% coverage of electricity consumption by renewable energies. Eight sectors and twenty-six fields of action have been defined to achieve these goals.

41 See <https://www.energieautonomie-vorarlberg.at/de/das-ist-energieautonomie/>.

42 See <https://www.tirol2050.at/>.

43 See <https://www.energieautonomie-vorarlberg.at/de/>.

44 See <https://vorarlberg.at/-/klimawandelanpassung-infoportal-vorarlberg>.

45 IntT_04.

groups, such as the general public, enterprises or municipalities. Examples in Tyrol are the annual TRIGOS prize for sustainable operations in cooperation with the Chamber of Commerce,⁴⁶ the sustainability exhibition Eco Fair,⁴⁷ the municipal representatives' courses on climate-change in cooperation with the Climate-Alliance Tyrol,⁴⁸ the Double Plus Program⁴⁹ and many more.⁵⁰ Examples in Vorarlberg are the E5- municipality program,⁵¹ the course on climate change for communal representatives,⁵² the *Ökoprofit* program,⁵³ the *Gemeindeplattform*⁵⁴ and the *V-Mobil*.⁵⁵

The policy area-specific climate initiatives place a particular focus on the under-30 target group, which is generally difficult to reach.⁵⁶ To better reach this target group, awareness-raising initiatives are organized in schools.⁵⁷ The attempt to involve people under 30 leads to a shift in the means of communication from traditional media, such as local newspapers like the *Tiroler Landeszeitung*, to social media, such as Facebook, YouTube, Instagram and Twitter.⁵⁸ Finally, both public officials and civil society groups generally recognize that it is also important to increase the involvement of social movement organizations, such as Fridays for Future groups, to achieve better access to young people.⁵⁹

46 See <https://trigos.at/about/trigos-regional/tirol/>.

47 See <https://www.oeko-fair.at/de/>.

48 See <https://tirol.klimabuendnis.at/gemeinden-angebote/tirol-gemeinsam-in-den-gemeinden-aktiv>.

49 See <https://www.doppelplus.tirol/de/home/>.

50 In this specific regard, see point 3.14 "Awareness-building" in the table of measures of the climate progress report, which offers an overview of the internal and external information initiatives and projects; *supra* note 39.

51 See <https://www.energieinstitut.at/gemeinden/das-e5-landesprogramm/e5-gemeinden-in-vorarlberg/>.

52 See <https://www.klimabuendnis.at/aktuelles/klimaschutzlehrgang-2021>.

53 See <https://vorarlberg.at/oekoprofit>.

54 See <https://vorarlberg.at/-/vorarlberg-mobil-gemeindeplattform>.

55 See <https://www.vmobil.at/>.

56 IntV_03; IntV_07.

57 See for Tyrol <https://tirol.klimabuendnis.at/alle-schulstufen> and <https://www.oekolog.at/regionalteams/tirol/>; see for Vorarlberg <https://www.energieinstitut.at/ueber-uns/unsere-fachbereiche/bildung/fuer-kindergaerten-und-schulen/> and <https://www.energieautonomie-vorarlberg.at/de/energieautonomie-begreifen-von-klein-auf>.

58 See e.g. a temporary social media campaign, entitled "*Tirol schaut aufs Klima*", which was launched in June 2021 with the purpose of informing on climate-change related projects, initiatives and topics through short videos and to encourage target groups to engage sharing best-practice examples and tips: <https://www.tirol.gv.at/landesentwicklung/nachhaltigkeits-und-klimakoordination/tirol-schaut-aufs-klima/>.

59 IntV_06; IntV_07.

In a nutshell, voluntary information mechanisms are an important complement to existing binding information mechanisms. They ensure that the public has sufficient information on climate change. This in turn is a precondition for strong and effective public participation.

2.2 *Information Mechanisms in the Autonomous Provinces of Trento and Bolzano*

2.2.1 Binding Information Mechanisms

In Italy, the framework for the right to environmental information, and therefore regarding climate change, largely resembles the Austrian context already described due to the international and European legal sources that outline the fundamental features of this right.

Nonetheless, it should be noted that a right to public information is not expressly contemplated in the Italian Constitution. It was the Constitutional Court that, through thorough interpretation work, connected this right to the right of freedom of thought (*libertà di manifestazione del pensiero*), defined in article 21 of the Italian Constitution, and provided a first elaboration of the right to information in its decision 420/94, which states that it is necessary to “guarantee the maximum degree of external pluralism, in order to satisfy, through a plurality of competing voices, the citizen’s right to information”.⁶⁰

This right to information is included in article 22 of L. 241/90 (as amended by L. 15/05),⁶¹ which lays down the procedures and circumstances under which citizens may access the acts of the public administration.⁶² The national regulatory framework is completed by the provisions contained in D.lgs. 33/2013 concerning “Reorganization of the rules on the right of civic access and the obligations of publicity, transparency and dissemination of information by public administrations”. In light of the European and international rules already mentioned in the previous paragraphs,⁶³ the legal framework concerning the right to and access to information in environmental matters is much

60 Corte Cost. 420/1994; on this V. Sarcone, “Alcune considerazioni in merito al diritto all’informazione pubblica”, *Rivista Trimestrale di Scienza dell’amministrazione*, 1 (2004) 63ff.

61 Article 22 L. 241/1990, “Nuove norme in materia di procedimento amministrativo e di diritto di accesso ai documenti amministrativi”.

62 On this see S. Cassese *et al.*, *P.A.: trasparenza amministrativa e accesso agli atti* (Ipsos 2018); C. Cudia, “Trasparenza amministrativa e pretesa del cittadino all’informazione”, *Diritto Pubblico*, 1 (2007) 99–154, at 121ff.

63 See *supra* section 2.1.

broader, as provided by article 40 of D.lgs. 33/2013.⁶⁴ Unlike the general right of access to public information provided by national law, under which a specific interest has to be demonstrated to obtain the information requested, according to the Aarhus Convention everyone has the right to request and obtain information on the environment without having to demonstrate a specific interest or reason.

In Italy, the right of access to environmental information is regulated by D.lgs. 195/05, which implemented Directive 2003/4/EC on public access to environmental information.⁶⁵ The Directive followed the ratification of the Aarhus Convention and introduced the recognition of the right of access to environmental information contained in acts produced by the public administration within the national legal system. To guarantee this right to environmental information, the public administration must not only play a reactive role and ensure the transparency of the data in terms of its availability, but also a proactive role by actively promoting the collection, updating and dissemination of information. Guidance activities, awareness-raising and environmental education campaigns, electronic databases, registers, inventories and reports on the state of the environment are some of the tools the public administration must use for this purpose.⁶⁶

At the subnational level, in the Autonomous Province of Trento L.P. 4/2014⁶⁷ regulates the right of access to information (“civic access”) held by the public administration by transposing the same rules provided for in D.lgs. 33/2013. Furthermore, the abovementioned article 40 of D.lgs 33/2013 is directly applicable in the provincial legislative framework and implements previous national legislation on the dissemination of environmental information. It establishes that administrations shall publish and specifically highlight on their institutional websites the environmental information they hold for the purposes of their institutional activities.

In this respect, the “Three-Year Plan for the Prevention of Corruption and Transparency 2020–2022” outlines the planned procedures for disseminating

64 Art. 40 D.lgs. 33/2013 “*Riordino della disciplina riguardante il diritto di accesso civico e gli obblighi di pubblicità, trasparenza e diffusione di informazioni da parte delle pubbliche amministrazioni*”.

65 D.lgs. 195/2005 “*Attuazione della direttiva 2003/4/CE sull’accesso del pubblico all’informazione ambientale*”.

66 See F. Fonderico, “Il diritto di accesso all’informazione ambientale”, *Giornale di diritto amministrativo*, 6 (2006) 675–685, at 676; see also N. Brutti, *Il diritto all’informazione ambientale. Profili comparatistici* (Giappichelli 2005), at 63ff.

67 L. P. 4/2014 “Disposizioni riguardanti gli obblighi di pubblicità, trasparenza e diffusione di informazioni e modificazione della legge provinciale 28 marzo 2013, n. 5”.

environmental information.⁶⁸ The Transparent Administration portal of the Autonomous Province of Trento contains a special section dedicated to the dissemination of environmental information with precise indications of the websites and web pages where information is available.⁶⁹ The Provincial Environmental Protection Agency (*Agenzia Provinciale per la Protezione dell'Ambiente*, hereinafter APPA Trento) contributes to ensuring the right of access to the substantial environmental information it possesses and to dissemination activities. As far as access to the environmental information held by the APPA Trento is concerned, anyone can request this through the abovementioned procedure generally provided for by the structures of the Autonomous Province of Trento. The dissemination of environmental information is mainly carried out through the APPA Trento website and the Report on the State of the Environment in the Province of Trento, a periodical publication also available online.⁷⁰

D.lgs. 195/2005 and D.lgs. 33/2013⁷¹ regulate the right and access to environmental information in the Autonomous Province of Bolzano. A presidential decree (D.P.P. 4/2020 in its articles 41–46) integrates the legislative framework.⁷² The Environment and Climate Protection Agency (hereinafter APPA Bolzano) is responsible for implementing these reporting obligations. Similarly to the APPA Trento, it is required to make available information, data and documents on the state of the environment in the territory of the Autonomous Province of Bolzano on its website.⁷³

According to some of the interviewees, despite the existing legislative framework on the right to obtain environmental information, the procedure to follow is complicated and not always straightforward. In particular, some of the interviewees in the Province of Bolzano expressed concern about the way in which environmental information can be obtained. One interviewee affirmed that obtaining such information can be difficult because sometimes (i.) the administration is concerned about giving out environmental information because they do not know what citizens will do with the data; (ii.) the administration does not have the information citizens are looking for; (iii.) the

68 Approved by the Provincial Council with resolution No. 95/2020.

69 See www.trasparenza.provincia.tn.it.

70 See www.appa.provincia.tn.it.

71 See *supra* notes 64 and 65.

72 DPP 4/2020 “Regolamento sull'esercizio del diritto di accesso nonché dei diritti derivanti dagli obblighi di pubblicità, trasparenza e diffusione di informazioni delle pubbliche amministrazioni”.

73 See <https://ambiente.provincia.bz.it/servizi/informazioni-ambientali.asp>.

administration replies that information is already available on the website in order to keep information undisclosed.⁷⁴ Another interviewee argued that, although transparency and the provision of environmental information is not a particular strength of the Province of Trento, it is also necessary for citizens to make an effort to obtain the information they are interested in, as many information channels are in place for this purpose.⁷⁵

2.2.2 Voluntary Information Mechanisms

Following the prescription of the regulatory framework on environmental information, both Provinces launched information campaigns on environmental issues. Their respective environmental agencies (APPA Trento and APPA Bolzano) committed to share and promote environmental information and activate communication initiatives.

The interviews conducted clarified that in the Province of Bolzano the communication strategies implemented by the APPA Bolzano vary according to sector (water, mobility, energy, etc.) and are mainly provided through both traditional and online channels, such as the Agency's website.⁷⁶

In both the transport and energy sectors, climate change awareness campaigns were launched by the administration to reach as many citizens as possible.⁷⁷ The "Green Mobility" project is the main initiative implemented by the Province of Bolzano, together with STA – *Strutture Trasporto Alto Adige SpA/Südtiroler Transportstrukturen AG*, on sustainable mobility.⁷⁸ It is a good example of the Province's communication and information campaign on climate change.⁷⁹ The project encompasses different actions, such as a collaboration with electric car producers to offer the opportunity to citizens to test electric cars, or the involvement in the European project LIFEalps launched in 2019 with the aim of transforming South Tyrol into a model region for zero-emission mobility in the Alps,⁸⁰ also through the development of the campaign hashtag #mobilitygreen.⁸¹ This set of initiatives, all under the umbrella of the Green Mobility project, is supported by a strong communication campaign conducted mainly via websites and social media. Traditional information channels are

74 IntBZ_04.

75 IntTN_10.

76 See N. Bertuzzi *et al.* (eds.), *Interview Report Bolzano, Trento, Vorarlberg and Tyrol* (2021) and <https://ambiente.provincia.bz.it/servizi/informazioni-ambientali.asp>.

77 IntBZ_05.

78 See <https://www.greenmobility.bz.it/en/>.

79 IntBZ_05.

80 See <https://www.life-alps.eu/>.

81 IntBZ_05.

also used, as it is not uncommon to hear about or read about Green Mobility initiatives on local radio, television and in newspapers.

With regard to the energy sector, one of the interviewees reported that the Internet is the main source of environmental information, since the “informative evenings” organized by *ComuneClima* at the municipal level were cancelled because of the Covid 19 pandemic.⁸² It was also highlighted that an information desk for municipalities and public administrations was introduced in March 2020, which provides all information services regarding technical advice, incentives and related energy saving information in a single location. Among the information available to citizens, we can find a CO₂ online calculator, which allows people to understand the ecological impact of their actions and lifestyle. The respondent also stated that much information is available on the *Klimaland* website, which is a good example of a communication strategy designed specifically to inform citizens.⁸³

In the Province of Trento, information campaigns on climate change also vary according to the policy sector and there is no unified communication strategy, as various interviewees pointed out.⁸⁴ Instruments for informing citizens and civil society groups on issues related to climate change range from traditional campaigns in newspapers, radio and local television to more innovative social media campaigns or online platforms. The *Climatrentino* website was set up by the Province and APPA Trento to collect all possible information on sustainability and climate change. As mentioned by the interviewees, this website was developed in collaboration with academic and scientific actors in the Province (the University of Trento, *Fondazione Edmund Mach*, *Fondazione Bruno Kessler*, MUSE – Science Museum), to make various educational and informative documents on climate change available to the public.⁸⁵

With regard to information campaigns targeted at young people (under 30) on climate change, as already seen for the *Länder* Tyrol and Vorarlberg, both Provinces made greater use of new information channels, in particular social media. Schools were also the target of various information campaigns. APPA Trento has provided a catalogue of teaching materials on climate and

82 IntBZ_08.

83 See <https://www.klimaland.bz/it/>.

84 See N. Bertuzzi *et al.* (eds.), *Interview Report, supra*.

85 Among these: “Previsioni e conseguenze dei cambiamenti climatici in Trentino” (2008); Temperature and precipitation report “Analisi di serie di temperatura e precipitazione in Trentino nel periodo 1958–2010” (2012); Climate Map of Trentino (presented at a conference organised in 2017 by the *Osservatorio* entitled “*Dalle temperature ai ghiacciai: la ricerca racconta la storia di un clima che cambia*” as reported by IntTN_07.

sustainability on a dedicated website for teachers.⁸⁶ In addition, respondents from both provinces stressed the importance of increasing the involvement of youth social movement groups such as Fridays for Future.⁸⁷

3 Participation and Climate Change Integration

3.1 *Participation in Tyrol and Vorarlberg*

3.1.1 Binding Participation

Legal participation rights in Tyrol and Vorarlberg fall into three groups: rights to submit comments on policies, rights to advise the government in dedicated advisory bodies, and rights to judicial review.

The Vorarlberg Spatial Planning Act grants every citizen the right to submit comments on regional spatial plans, environmental reports, land development and zoning plans within at least four weeks after adoption of the draft.⁸⁸ In Tyrol, the Chambers of Labor, Commerce and Agriculture, the Chamber of Civil Engineers for Tyrol and Vorarlberg, and, depending on the geographical scope, the association of municipalities, individual municipalities, or planning associations have the right to submit comments on spatial development plans within two months after adoption of the draft. Principal residents or businesses owning real estate or a company in the municipality can submit comments if the plans include certain measures listed in the law.⁸⁹ According to the Roads Act in Vorarlberg,⁹⁰ any community citizen or property owner can suggest changes in writing or orally in the municipal office to draft road and path concepts and their amendments within at least four weeks after adoption of the draft. In Tyrol, the public can comment on draft strategic environmental noise maps or action plans within six weeks after adoption of the draft. The government must summarily review the comments submitted and inform the public of their consideration, particularly on the Internet.⁹¹

In spatial planning and nature conservation, the legislation of the two *Länder* establishes advisory bodies whose function is required by law in certain cases. These advisory councils consist of the Chambers of Labor, Commerce and Agriculture, the Chamber of Civil Engineers for Tyrol and Vorarlberg and

86 See <https://educazioneambientale.provincia.tn.it/>.

87 IntTN_11; IntBZ_09.

88 *Raumplanungsgesetz (Vorarlberg)* StF: LGBl. No. 39/1996, §§ 6, 11, 21, 29.

89 *Tiroler Raumordnungsgesetz 2016 – TROG 2016* StF: LGBl. No. 101/2016, § 9 (1–3).

90 *Straßengesetz (Vorarlberg)* StF: LGBl. No. 79/2012, § 16.

91 *Tiroler Straßengesetz* StF: LGBl. No. 13/1989, § 74i(1) and (3).

the association of municipalities, but also include members from the scientific community and environmental organizations.⁹² The advisory councils advise the government on all matters of expertise falling within their area of responsibility. They can be consulted by the government and issue opinions or recommendations on plans and programs.

The implementation of the Aarhus Convention in 2019⁹³ has strengthened the participation of environmental organizations recognized by the Federal Ministry⁹⁴ at both the federal and the subnational level. In both *Länder* recognized environmental organizations have the right to procedural participation in nature impact assessment procedures. They can submit a written statement, inspect the files within four weeks after publication and have the right to appeal to the Administrative Court in nature impact assessment procedures or in cases of exemptions under the Habitats Directive⁹⁵ and the Birds Directive.⁹⁶ Finally, they have rights to seek judicial review in authorization procedures related to protected areas.

Federal law regulates environmental impact assessments⁹⁷ and gives neighbors and recognized environmental organizations status as a qualified affected party when they submit objections. Two hundred citizens can gain party status if they submit a joint statement. Environmental organizations, neighbors and citizens' initiatives with party status can request judicial review. In contrast, individual citizens who are not neighbors can only become stakeholders in the proceedings and therefore inspect files, but cannot file complaints with the courts.

The *Bund* involves stakeholders in the development of the national water management plan and gives every citizen the opportunity to comment on the

92 *Tiroler Naturschutzgesetz 2005 – TNSchG 2005* StF: LGBl. No. 26/2005, § 35; *Gesetz über Naturschutz und Landschaftsentwicklung* StF: LGBl. No. 22/1997, § 52; *Raumplanungsgesetz (Vorarlberg)*, § 4; *Tiroler Raumordnungsgesetz*, § 18.

93 *Gesetz vom 19. Dezember 2019, mit dem das Tiroler Naturschutzgesetz 2005, das Tiroler Jagdgesetz 2004 und das Tiroler Fischereigesetz 2002 geändert werden (Tiroler Aarhus-Beteiligungsgesetz 2019)* StF: LGBl. No. 163/2019; *Gesetz über Beteiligung im Naturschutz-, Jagd- und Fischereirecht (Aarhus-Beteiligungsgesetz) – Sammelnovelle* StF: LGBl. No. 67/2019.

94 *Umweltverträglichkeitsprüfungsgesetz 2000 – UVP-G 2000* StF: BGBl. No. 697/1993, § 19(6)-(9).

95 Council Directive 92/43/EEC of 21 May 1992 on the conservation of natural habitats and of wild fauna and flora, OJ L 206/1992, 7–50.

96 Directive 2009/147/EC of the European Parliament and of the Council of 30 November 2009 on the conservation of wild birds, OJ L 20, 26.1.2010, 7–25.

97 § 19 UVP-G 2000.

draft as well as on flood risk management plans.⁹⁸ Moreover, environmental organizations have a right to comment on water law permit procedures and a right of appeal to administrative courts concerning the same.⁹⁹ According to the Air Pollution Control Act,¹⁰⁰ environmental organizations and individuals may appeal to administrative courts if they are directly affected by the exceedance of an air pollution threshold or target value. In the case of the air pollution control program,¹⁰¹ affected persons and recognized environmental organizations can file an application with the governor of the *Land* within eight weeks to review the suitability of the measures contained in the program.

3.1.2 Voluntary Participation *Consultative Participation*

Consistent with the institutional culture reflected in law, a look at the practice of voluntary participation in the two Austrian *Länder* shows that participation is predominantly consultative. Consultation is defined in distinction to deliberation as a request or collection of opinions and expertise, whereas deliberation, as will be explained in more detail in the next section, focuses on the joint process of understanding and its transformative potential.

In Tyrol, stakeholders and interest groups were involved in the creation of the spatial development plan “*LebensRaum Tirol – Agenda 2030*”,¹⁰² the 2011 criteria catalog for the further use of hydropower¹⁰³ and the Tyrol 2050 energy autonomy initiative¹⁰⁴ by way of written consultation and workshops. A particularly inclusive example is the Sustainability and Climate Strategy.¹⁰⁵ In the first phase of strategy development, the administration gathered input through workshops with a broad range of stakeholders and a public online survey. Further stakeholder workshops on thematic priorities followed. Citizens could comment on the draft strategy online. The project team summarized the comments and included them in the final strategy, which was adopted in 2021.¹⁰⁶ An annual exchange with selected stakeholders serves to jointly evaluate the progress of implementation.¹⁰⁷

98 § 55m WRG. 1959.

99 § 102(2) WRG. 1959.

100 *Immissionsschutzgesetz – Luft*, 1G-L StF: BGBl. I No. 115/1997, § 9a(1a) and (11)-(13).

101 *Emissionsschutzgesetz Luft 2018 – EG-L 2018 StF*: BGBl. I No. 75/2018, § 6(6)-(10).

102 *LebensRaum Tirol. Agenda 2030. Raumordnungsplan* (Innsbruck, April 2019).

103 *Wasserkraft in Tirol. Kriterienkatalog. Kriterien für die weitere Nutzung der Wasserkraft in Tirol* (Innsbruck, März 2011).

104 *Tirol energieautonom 2050*, <https://www.tirol2050.at/>; IntT_03.

105 *Leben mit Zukunft. Tiroler Nachhaltigkeits- und Klimastrategie* (Innsbruck, September 2021).

106 IntT_02; IntT_04; IntT_06; IntT_07.

107 IntT_07.

Vorarlberg has similar stakeholder processes to Tyrol, but uses them more frequently and on a broader and more dialogue-oriented basis. For example, the development of the spatial planning strategy included a conference with various interactive discussion formats and actions to engage in dialogue throughout the *Land*. Participation is more widespread in Vorarlberg than in Tyrol, where information still takes precedence over participation. A civil society respondent in Vorarlberg highlighted the need to bring together all stakeholders to increase the acceptance of measures. Reconciling different interests appears a challenge, especially in the case of major cross-cutting issues, such as climate change.¹⁰⁸

Policymakers involved economic interest groups and businesses in the preparation of the freight transport concept¹⁰⁹ via three thematic working groups, a conference and two advisory sounding boards.¹¹⁰ Prior to the development of the Energy Autonomy + Strategy in 2021, the public administration organized workshops with experts, representatives of NGOs and stakeholders from civil society, as well as a public online consultation. The collected statements were thematically clustered, evaluated and integrated into a final paper,¹¹¹ which outlined how input was integrated into the final strategy.

After a consultation within the administration, two-hundred-and-fifty participants from a broad range of sectors and organizations contributed to the second draft of the spatial planning strategy of Vorarlberg "*Raumbild 2030*"¹¹² during an interactive conference. The project team evaluated the results and integrated them into the third draft. Subsequently, stakeholders and interested citizens participated through a day of action at a festival and spatial vision walks across the *Land*, an online survey with one-hundred-and-thirteen participants, and a written review process. The project team published a report on how it incorporated the feedback into the strategy.¹¹³

108 IntV_07.

109 Amt der Vorarlberger Landesregierung, *Güterverkehrskonzept Vorarlberg*; <https://vorarlberg.at/-/gueterverkehrskonzept-vorarlberg>.

110 The "Sounding Board" (the English term is used as the official designation in German) is a broad resonance group with representatives from business, administration, municipalities and regions. The term originates from change management, where a sounding board accompanies change processes in an advisory capacity.

111 IntV_03; IntV_07.

112 *Raumbild Vorarlberg 2030. Zukunft Raum geben* (Bregenz, April 2019).

113 W. Pfefferkorn, *Raumbildung Vorarlberg 2030. Rückmeldungen aus dem Beteiligungsprozess und ihre Berücksichtigung im Raumbild-Text. Zusammenfassung* (Rosinak & Partner 2019), at 2.

The processes outlined allow well-organized interest groups, and to a lesser extent informal groups and citizens, to contribute objections, opinions and expertise. Participation is limited by informational asymmetries and the gate-keeping role of policymakers, who decide on the format, participants, and inclusion of comments and ideas in policies. A civil society respondent in Tyrol called for a better structuring of the processes, sufficient time resources and clear feedback to avoid frustration.¹¹⁴ A public official in Vorarlberg highlighted the need to make the actual space of influence of civil society and the limits to the discretion of the administration more transparent and suggests information events to promote understanding of technical aspects,¹¹⁵ while other stakeholders indicated adequate information not only about the results, but also about the reasons for excluding their contributions, as important elements.¹¹⁶

Deliberative Participation

The goal of deliberative processes is not participation itself, but the creation of effective decisions supported by all. To achieve these decisions, discussion processes take place in which all actors involved exchange their views rationally and with the help of argumentative justifications.¹¹⁷ At the end of these discussion processes, all participants should jointly agree on a result that embeds the diverse particular interests in a greater common good.¹¹⁸

Deliberative formats that envision transformative processes of shared opinion formation are less common than consultative formats, which provide the opportunity to contribute opinions and expertise in the two *Länder*. The anticipatory adaptation that climate change requires of societies involves scientific uncertainty and spans long time periods. This complicates the problem-solving capacity of participation, as citizens must consider these uncertainties and long time frames in their decisions. Deliberation offers a possibility to reach an understanding even across complex contexts and uncertainties, because the process of understanding is in the foreground. Greater scope for deliberative participation in identifying issues and effectively implementing policies

114 InT_06.

115 IntV_06.

116 IntV_07.

117 See J. Habermas, *Faktizität und Geltung. Beiträge zur Diskurstheorie des Rechts und des demokratischen Rechtsstaates* (Suhrkamp 1992); J. Bohman and W. Rehg (eds.), *Deliberative Democracy. Essays on Reason and Politics* (MIT Press 1997).

118 D. Miller, "Deliberative Democracy and Social Choice", *Political Studies*, 40 (1992) 54–67, at 54.

has the potential to enhance the quality of policymaking,¹¹⁹ also in the field of climate change by creating a common understanding of the problems and a process of agreement on solutions that are shared by all.

Vorarlberg has a long tradition of participation. In 1999, the *Land* established the Office for Future Issues, today the Office for Voluntary Engagement and Participation. As a staff unit, it initiates, supports and coordinates participatory processes in administrations and municipalities.¹²⁰ Since 2013, Vorarlberg has committed via article 1(4) of its Constitution “to direct democracy in the form of initiatives, referendums and public consultations and also promotes other forms of participatory democracy”.

In 2006, the Office for Voluntary Engagement and Participation adapted the “Wisdom Council” developed in the USA,¹²¹ as a Citizens’ Council for Vorarlberg. The government adopted a Directive on the Citizens’ Council.¹²² According to the Directive, the Citizens’ Council aims to develop broadly accepted, joint solutions to difficult, complex issues affecting the common good. It can be initiated at the request of the government, the parliament or at least one thousand citizens. In the Councils, between twelve and sixteen randomly selected citizens discuss specific topics. The Citizens’ Council is neither guided nor steered. Professional facilitators accompany the process using the solution-oriented method “Dynamic Facilitation”, which focuses on the free expression of all participants. Experts may be consulted. The results are summarized in a unanimous report and presented in a “Citizens’ Café”, a public event with citizens and relevant representatives from politics, administration, interest groups and experts. Subsequently, a resonance group consisting of responsible representatives of the political executive and legislative branches as well as public officials from the departments concerned examines the feasibility of the proposals.¹²³ The proposals are not formulated as concrete legal acts, but as goals and measures. Proposals that affect *Land* legislation or administration are forwarded to the parliament and addressed by the government, which

119 R. Few, K. Brown and E.L. Tompkins, “Public Participation and Climate Change Adaptation: Avoiding the Illusion of Inclusion”, *Climate Policy*, 7 (1/2007) 46–59, at 55.

120 IntV_03.

121 H. Asenbaum, “Facilitating Inclusion: Austrian Wisdom Councils as Democratic Innovation between Consensus and Diversity”, *Journal of Public Deliberation*, 12(2) (2016).

122 *Richtlinie der Vorarlberger Landesregierung zur Einberufung und Durchführung von Bürgerräten*, <https://vorarlberg.at/documents/302033/472141/Richtlinie+B%C3%BCrger+raten.pdf/4d1dc47a-d15e-18ad-e65f-11baa9b8624e?t=1620229041400>.

123 Amt der Vorarlberger Landesregierung, *Was ist ein Bürgerrat?*, <https://www.buergerrat.net/at/vorarlberg/>.

informs the Citizens' Council and the public about the outcome of the deliberations and the further consideration of the proposals.

In 2020, citizens initiated a Citizens' Council on Vorarlberg's climate future. It was the 12th *Land*-wide council and the third initiated by citizens.¹²⁴ Along with workshops with stakeholders and experts, a further Citizens' Council initiated by the public administration¹²⁵ contributed to the development of the mobility concept in 2019.¹²⁶ Ten workshops, the engagement of about 100 experts, and specially established regional Citizens' Councils contributed to the first phase of the Energy Autonomy Strategy,¹²⁷ which was adopted in 2009. Annual stakeholder consultations, which include sectoral experts, support the implementation of the program.¹²⁸

Impact analyses in Vorarlberg show that the influence of Citizens' Councils is difficult to grasp and hardly any direct decisions and measures result from their recommendations. Citizens' Councils primarily fulfil a legitimization function by increasing citizens' backing and acceptance of political decisions¹²⁹ and their will to engage, as well as by changing personal attitudes to an issue.¹³⁰ Since these effects apply to a relatively small number of citizens, the *Land* Vorarlberg financially supports information events on participatory practices in the Long Night of Participation "LaNaP".¹³¹ As part of the "Energy Autonomy" program, the *Land* provides financial support for citizen participation in sustainable energy generation and mobility projects.¹³²

124 Amt der Vorarlberger Landesregierung, *Bürgerrat: Klima-Zukunft*, https://vorarlberg.at/-/b%C3%BCrgerat-klima-zukunft;IntV_03.

125 IntV_05.

126 *Mobilitätskonzept Vorarlberg 2019* (Bregenz, July 2019), at 5.

127 IntV_07.

128 IntV_06.

129 L. Weiß, *Partizipation im Kontext nachhaltiger Stadt- und Regionalentwicklung. Eine Wirkungsforschung am Beispiel der BürgerInnen-Räte in Vorarlberg*, Master's thesis (University of Innsbruck 2019); M. Hellrigl, "Bürgerräte in Vorarlberg", in P. Bußjäger, A. Balthasar and N. Sonntag (eds.), *Direkte Demokratie in Diskurs: Beiträge zur Reform der Demokratie in Österreich* (New Academic Press 2014) 163–168.

130 K. Toth, *Public Participation, Sustainability and Environmental Awareness. Case Study of the Effect of Wisdom Councils on Participants in the Region Bregenzerwald*, Master's thesis (University of Copenhagen 2017); D. Oppold, *Effekte deliberativer Demokratie am Beispiel der Bürgerräte in Vorarlberg*, Master's thesis (University of Konstanz 2016).

131 *Lange Nacht der Partizipation*, <https://www.langenachtderpartizipation.at/>.

132 *BürgerInnenbeteiligung für Klimaschutzprojekte, Förderungsrichtlinie 2021 und 2022*, https://vorarlberg.at/documents/302033/472360/F%C3%B6rderungsrichtlinie_B%C3%BCrgerbeteiligung_Klimaschutzprojekte_2021_und_2022.pdf/cb82b0c3-ff9e-7989-d808-4edfd10ccf5e?t=1620106739795.

In Tyrol, deliberative forms of policy development are less common. Municipalities can set up Citizens' Councils also to discuss issues that affect more than one municipality, for example along the Fernpass route on sustainable connectivity¹³³ or in the Wipptal valley on regional development.¹³⁴ Moreover, Tyrol promotes cross-border citizen participation. Under the Tyrolean presidency, the European Region Tyrol-South Tyrol-Trentino (Euregio) established Citizens' Councils.¹³⁵ In 2021, the EU Strategy for the Alpine Region launched a Youth Council under Tyrolean leadership. It allows randomly selected young people to participate in institutional bodies, to give opinions, to submit comments and to work on projects on the topics identified in the EUSALP Action Plan.¹³⁶

Participation of Young People and Online Participation

Engaging young people, who are particularly affected by climate change, remains a challenge. Since stakeholder processes address organized groups, the movement groups of Fridays for Future represent a way to engage people under 30. Respondents see a certain agenda-setting power of Fridays for Future.¹³⁷ According to a public official in Tyrol, the political decision to renew the Sustainability and Climate Strategy also originated in a meeting between the political representatives responsible and local Fridays for Future groups.¹³⁸

Administration and civil society in Tyrol see social media and online platforms as helpful, but still underdeveloped tools to engage young people.¹³⁹ While in Tyrol, sporadic online consultations gather input and feedback, Vorarlberg uses digital tools more regularly. This practice was reinforced during the Covid-19 pandemic.¹⁴⁰ The Department of Spatial Planning and the Office

133 Amt der Tiroler Landesregierung, *Lärmschutz Breitenwang fertig, Probebetrieb für Anzeigetafeln startet* (24 October 2018), <https://www.tirol.gv.at/meldungen/meldung/laermschutz-breitenwang-fertig-probebetrieb-fuer-anzeigetafeln-startet/>.

134 Regional Management Wipptal, *WippCare mitdenken*, <https://wipptal.mitdenken.online/>.

135 W. Obwexer, "Die Reform der Europaregion Tirol-Südtirol-Trentino: Erste Novellierung der Rechtlichen Grundlagen nach zehn Jahren", *Europäisches Journal für Minderheitenfragen*, 3–4 (2021) 373–388, at 373.

136 EU Strategy for the Alpine Region Youth Council, <https://eusalp-youth.eu/eusalp-youth-council/>.

137 IntV_01; IntV_02; IntV_03; IntV_07; IntT_01; IntT_04; IntT_06_civil; IntT_07.

138 IntT_01; IntT_04; IntT_06; IntT_07.

139 IntT_02; IntT_06.

140 IntV_01; IntV_05; IntV_02. By January 2022, citizens contributed to fifteen municipal, eight regional and five *Land*-wide issues on the platform "Vorarlberg Mitdenken". In addition, four event-related and fourteen stakeholder-led consultations took place. See also *Vorarlberg Mitdenken*; <https://vorarlberg.mitdenken.online/>; Amt der Vorarlberger

for Voluntary Engagement and Participation developed a guide for digital participation of all age groups at the *Land* and municipal level in times of social distancing.¹⁴¹

3.2 *Participation in the Autonomous Provinces of Trento and Bolzano*

3.2.1 Binding Participation Procedures

Regarding the right to environmental information, the implementation of the Aarhus Convention in the Italian legal framework has played a central role in enhancing the possibilities for the public to participate in environmental decision-making processes.¹⁴² Among the instruments that citizens have at their disposal for getting involved in the development of climate change policies, interviewees first referred to the possibilities to interact with communal or provincial councilors, who act as intermediaries in the dialogue with the governing bodies: these interactions include inquiries, consultations, motions and citizens' initiatives.¹⁴³ Citizens can also undertake petitions on specific environmental issues, which are partly linked to climate change.¹⁴⁴

It is important to underline that these instruments, normally treated as means that enable citizen participation, cannot be considered as tools of what has been defined as deliberative participation in the previous section.¹⁴⁵ Consultations, citizens' initiatives and petitions are primarily intended as a means to obtain information or share opinions. They do not aim at including the opinions expressed by citizens in a deliberative process on the basis of

Landesregierung, *Vorarlberg Mitdenken Plattform. Per Mausclick schnell und unkompliziert zu wichtigen Themen einbringen*, <https://vorarlberg.at/-/online-beteiligung-in-vorarlberg>.

141 Amt der Vorarlberger Landesregierung, Büro für Freiwilliges Engagement und Beteiligung, *Raumwechsel. Ein Inspirationshandbuch für digitale Beteiligung* (Bregenz, October 2020), <https://vorarlberg.at/-/raumwechsel>.

142 On the Aarhus Convention see J. Revill *et al.*, *The Aarhus Convention: Tools for Compliance and Enforcement from Beyond WMD regimes* (UNIDIR 2021), 5–9.

143 On the characteristics and differences among these democratic tools in the Italian legal framework see: M. Trettel, *La democrazia partecipativa negli ordinamenti composti: studio di diritto comparato sull'incidenza della tradizione giuridica nelle democratic innovations* (ESI 2020), at 67ff.

144 As reported by IntTN_07.

145 See section 3.1.2. We can intend as deliberative democratic innovation (or participatory democracy) those “processes or institutions, that are new to a policy issue, policy role, or level of governance, and developed to reimagine and deepen the role of citizens in governance processes by increasing opportunities for participation, deliberation and influence”. Definition provided by S. Elstub and O. Escobar “Defining and Typologizing Democratic Innovations”, in S. Elstub and O. Escobar (eds.), *Handbook of Democratic Innovation and Governance* (Edward Elgar Publishing 2019) 11–31, at 28.

which the governing bodies adopt a co-developed regulatory act. As already mentioned in the previous sections, binding instruments for participation grant citizens the possibility to express their opinions and raise objections, but hardly provide any chance for effective influence on policymaking.

In the context of these more traditional participation instruments, the Province of Trento offers an interesting example of a citizens' initiative. The latter was also mentioned by some of the interviewees.¹⁴⁶ In 2014, the citizens' initiative law on sustainable mobility¹⁴⁷ was put forward by some of the main environmental stakeholders present in the Province through a highly participated signature collection.¹⁴⁸ The draft law contained twenty-two articles developed by drawing on good practices introduced in other alpine municipalities. In 2017 the draft law reached the Environment Committee (*Commissione Ambiente*), first, and the Provincial Council, second, to be discussed for final adoption. However, as reported by the interviewees in the report, the citizens' initiative bill clashed with the regulatory measures being developed at the same time by the provincial government and a dialogue with the administration was initiated to find a compromise, though in the end this was not achieved. In fact, the main measures foreseen in the bill drafted by the citizens were an increase in the provincial budget for the sustainable transport sector and the launch of a citizens' assembly on sustainable mobility, neither of which were actually implemented.¹⁴⁹

The main binding mechanisms provided by the Provinces of Trento and Bolzano to involve the public and civil society groups in environmental decision-making are the environmental impact assessment (hereinafter *Valutazione di Impatto Ambientale* or VIA) and strategic environmental assessment (hereinafter *Valutazione Ambientale Strategica* or VAS).¹⁵⁰ VIA is a procedure aimed at identifying, describing and assessing impacts on the environment and cultural heritage of a project, while the VAS is a similar process whose goal is to include environmental reasoning in the preparation of strategic documents and plans to verify their environmental impact. Both

146 IntTN_03, IntTN_06, IntTN_10.

147 *Disegno di legge di iniziativa popolare sulla mobilità sostenibile*, for more information see: <https://www.consiglio.provincia.tn.it/news/giornale-online/Pages/articolo.aspx?uid=178860>.

148 In particular Mountain Wilderness, *Legambiente*, WWF and other smaller organizations.

149 IntTN_06, IntTN_10.

150 L.P. 19/2013 "Disciplina provinciale della valutazione dell'impatto ambientale. Modificazioni della legislazione in materia di ambiente e territorio e della legge provinciale 15 maggio 2013, n. 9"; L.P. 17/2017 "Valutazione ambientale per piani, programmi e progetti".

procedures provide for participation by members of the public and specific environmental stakeholders who, within time limits regulated by law, can submit written observations and comments on the plans and initiatives that have environmental impacts. The bodies must take them into account when adopting final decisions.¹⁵¹ These procedures also provide the possibility for parliamentary minority groups, trade associations and environmental protection associations to request, within thirty days from the date of the start of the procedure, a public meeting to illustrate the project, in which all citizens may participate. Some interviewees considered the VAS procedure a particularly relevant means of participation when adopting strategic environmental plans in specific sectors. For example, one interviewee from Bolzano mentioned the process of adoption of the plans on water protection¹⁵² and water management¹⁵³ as examples of good practice in public participation.¹⁵⁴ Stakeholders, individual citizens and municipalities submitted two-hundred-and-fifteen comments on the draft Water Protection Plan. The document, which was subject to the VAS procedure, was examined by a special working group, which assessed each of the comments received individually and prepared a preliminary report. On the basis of this assessment, the Provincial Environmental Committee finally drew up its opinion as required by the VAS procedure.

Another experience worth mentioning is that of the consultative process activated by the Autonomous Province of Trento in the energy policy field, in particular with regard to the adoption of the Provincial environmental energy plan (*Piano energetico ambientale provinciale – PEAP*).¹⁵⁵ For the approval of this strategic document on energy matters, the consultation phase is mandatory and was implemented between March and April 2021, with a series of meetings for specific categories of stakeholders, however excluding ordinary citizens. Comments raised at the meetings were taken into account in the final adoption of the PEAP.¹⁵⁶

151 On public participation in the VIA procedure, see E. Frediani, “Le garanzie partecipative nella valutazione di impatto ambientale: strumenti tradizionali e dibattito pubblico”, *Le istituzioni del Federalismo*, 3 (2020) 657–678, https://www.regione.emilia-romagna.it/affari_ist/rivista_3_2020/indice.html.

152 Piano di tutela delle acque (resolution No. 516/2021).

153 Piano di gestione delle acque (resolution No. 147/2022).

154 IntBZ_06. See M. Alberton and F. Cittadino, “La tutela dell’ambiente”, in W. Obwexer *et al.* (eds.), *L’impatto dell’Unione europea sull’autonomia legislativa ed amministrativa dell’Alto Adige/Südtirol* (ESI 2015) 471–514.

155 See <http://www.energia.provincia.tn.it/peap/-categoria8/pagina33.html>.

156 See arts. 5–6 of D.P.P. 15-68/2006.

3.2.2 Voluntary Participation

Beyond the more traditional ways of involving the public, most of the processes to engage citizens in environmental decision-making do not consist of institutionally regulated or compulsory procedures, but are spontaneous initiatives launched by the administrations that envisage a consensual and deliberative type of participation.¹⁵⁷ Neither of the two provinces has a long tradition of deliberative citizens' involvement in decision-making akin to Vorarlberg's, but both provinces have made some efforts in recent years to initiate innovative processes on the model of more active Italian regions such as Tuscany and Emilia Romagna.¹⁵⁸ One main participatory process in the policy field of climate change for each of the two provinces can serve as an example.

In 2020, the Province of Bolzano started the revision of the existing Climate Plan (elaborated in 2011), with the aim of drafting – in the most participatory way possible – a climate strategy that contains sustainability objectives to be achieved by 2050.

In a first phase, the Provincial institutions and the Environment and Climate Protection Agency curated the draft of a new version of the Climate Plan. This work resulted in a document composed of one hundred measures, which were divided into six macro-areas: energy supply and intelligent energy management, rational and intelligent use of energy, redevelopment of buildings and construction, use of renewable energy, general prevention measures in climate protection, innovation and know-how transfer. Subsequently, the participation phase was opened. Every citizen could share comments, opinions, and ideas on the draft of the Climate Plan until 31 December 2021 through the portal www.klimaland.bz.¹⁵⁹ More than two hundred comments were received.¹⁶⁰ Both in the words of the interviewees¹⁶¹ and in the introductory pages of the draft of the Climate Plan,¹⁶² it is possible to recognize the importance granted

157 See J. Newig, E. Challies and N.W. Jäger, "Democratic Innovation and Environmental Governance", in S. Elstob and O. Escobar (eds.), *Handbook of Democratic Innovation and Governance*, *supra*, 324–338.

158 On this M. Trettel, "Democratic Innovations in (Subnational) Constitution-Making: The Institutionalized Case(s) of the Italian Provinces of Trento and Bolzano", *Innovation: The European Journal of Social Science Research*, 34(5) (2021) 782–802; and M. Brunazzo, "Istituzionalizzare la partecipazione? Le leggi sulla partecipazione in Italia", *Le Istituzioni del Federalismo*, 3 (2017) 837–864.

159 See <https://www.klimaland.bz/it/piano-clima-energia-alto-adige-2050/le-tue-misure/>.

160 See <http://lp.provincia.bz.it/2021/piano-clima-alto-adige/>.

161 IntBZ_07; IntBZ_12.

162 Piano Clima, Energia – Alto Adige 2050, as amended by Piano clima Alto Adige 2040, available here: <https://ambiente.provincia.bz.it/energia/piano-clima-energia-alto-adige-2050.asp>.

to the aspect of civic participation in the adoption of this essential strategic document. However, so far, participation is limited to the possibility of submitting comments and ideas on the online portal and does not provide for any innovative ways of involving the population. Also, at the time of writing (May 2022), it is still not completely clear what use will be made of the comments and ideas received even if in February it was announced that a committee of nine independent experts would be appointed to evaluate the submitted proposals by assessing their effectiveness, suitability and feasibility.¹⁶³

As reported by the interviewees,¹⁶⁴ the most relevant participatory process related to climate change in the Province of Trento is the involvement of the population in the definition of the provincial Sustainable Development Strategy (hereinafter *Strategia provinciale per lo Sviluppo Sostenibile* or *SproSS*).¹⁶⁵ Since the earliest stages of the drafting of the *SproSS*, the Province promoted the widest and most cross-cutting participation possible.

The first step of the process was to involve young people and students. During the period February-May 2020, partly in person and partly through participatory workshops, the Province collected 200 contributions in meetings with students at secondary schools and the University of Trento. The public administration made the contributions available on the *agenda2030* website and included them in the *SproSS* preliminary document. The second step was to collect experts' opinions through the Delphi Survey tool, a method of expert consultation based on mutual anonymity and structured on several rounds of interaction to define the provincial sustainability objectives. After that, the Province published the *SproSS* Preliminary Document on the website *agenda2030* together with videos and fact sheets for each of the five strategic areas identified in the document: i.e. Smarter Trentino; Greener Trentino; More Social Trentino; More Connected Trentino; Closer Trentino to Citizens, to which 20 provincial sustainability priority objectives have been allocated. All citizens, by accessing the website, could fill in an online questionnaire to indicate their satisfaction and their observations.¹⁶⁶ Finally,

163 See <https://news.provincia.bz.it/it/news/piano-clima-tavolo-di-esperti-esterni-per-le-proposte-dei-cittadini>.

164 IntTN_04 and IntTN_07.

165 See <https://agenda2030.provincia.tn.it/Trentino-2030/Strategia-provinciale-SproSS>.

166 The online questionnaire was completed by 330 citizens. The area that registered most interest was Trentino + green (37%) followed by + intelligent (27%) and + social (20%), while at the bottom were the areas + connected and + close to citizens (8% for both). The five most commented objectives were: emission reductions, biodiversity, territorial security, water and sustainable tourism. Citizens from all age groups participated in the consultation 29% between 18 and 30 years old, 33% between 30 and 50 years old, 31%

the public administration prepared a series of participatory workshops, held online due to the Covid-19 pandemic, with trade associations, citizens' associations, interest groups, municipalities and provincial administrators. Despite the organizational effort put in place, the participatory process still leaves open several doubts as to how the public administration will integrate the results of the citizens' involvement meetings since there is no obligation for the provincial government to take into account the outcomes of participatory processes, as is often the case when it comes to the effects of participatory tools.¹⁶⁷

Numerous efforts have been put in place also at local level in order to involve different stakeholders in mitigation and adaptation to climate change. One example of these initiatives is the experience of the European Covenant of Mayors.¹⁶⁸ Through their participation in this initiative launched in 2008, local authorities can join Europe's largest movement for local climate and energy action. This network of municipalities is committed to achieving emissions reduction targets to tackle climate change, including through the participatory involvement of citizens. Several municipalities in the Provinces of Trento and Bolzano have joined this initiative.¹⁶⁹

Despite the efforts put in place by both Provinces to strengthen the role of citizens in decision-making processes related to climate change, interviewees criticized the way in which citizens' opinions are taken into account in the political sphere and the effectiveness of the processes put in place. In particular, this refers to the degree of participatory culture in the provinces and whether there is sufficient knowledge to guarantee participatory processes in which citizens can make a real contribution to political decisions on climate change.¹⁷⁰

between 50 and 65 years old and 7% over 65 years old. See <https://agenda2030.provincia.tn.it/Trentino-2030/Percorso-partecipativo/Partecipanti-e-modalita>.

167 See Y. Papadopoulos and P. Warin, "Are Innovative, Participatory and Deliberative Procedures in Policy Making Democratic and Effective?", *European Journal of Political Research*, 46 (2007) 445–472; and J. Font, S. Pasadas del Amo and G. Smith, "Tracing the Impact of Proposals from Participatory Processes: Methodological Challenges and Substantive Lessons", *Journal of Public Deliberation*, 12(1) (2006) 1–25.

168 As reported by IntBZ_02 and IntBZ_03.

169 For further details on the municipalities that joined the initiative see: <https://www.eumayors.eu/en>.

170 IntBZ_04; IntBZ_02; IntBZ_11; IntTN_06; IntTN_05; IntTN_03.

4 Conclusion

The observations presented allow us to draw three groups of conclusions. First, institutions matter: the case studies – i.e. the *Länder* Tyrol and Vorarlberg and the two Autonomous Provinces Trentino and South Tyrol – show that political and institutional cultures influence information and participation practices. While established practices are perpetuated, dedicated institutions create expertise, awareness and acceptance. The participatory, direct-democratic culture and institutional structures dedicated to participation lead to a stronger use of participatory practices in Vorarlberg. In contrast, Tyrol, and the Autonomous Provinces of Trento and Bolzano, lack a culture of participation at the institutional level, which is why the participatory involvement of citizens in decision-making is not as widespread as in Vorarlberg. Voluntary mechanisms lack institutional binding force, but are often necessary due to the absence of legal obligations. Until mandatory mechanisms are fully developed, voluntary information and participation play a key role. The future will show to what extent the expansion of binding, and especially proactive information mechanisms and binding participation rights, will gradually replace voluntary practices.

Second, participatory practices in the subnational entities studied mainly serve to strengthen legitimacy and acceptance by hearing stakeholders' opinions and raising public awareness through consultations, while shared decision-making is not an explicit objective. Policymakers, through their gate-keeping role, determine participants, formats, and the extent to which contributions find their way into decisions, and thus have power over the outcome. Due to efficiency reasons and network effects, established actors with strong links to politics and administration are more likely to participate than informal groups or citizens. Social movements such as Fridays for Future can be a gateway to institutional participation for young people. Online participation is easily accessible but limited to soliciting opinions and constrained by informational asymmetries. Citizens' Councils in Vorarlberg also aim to motivate citizen engagement and transform attitudes, but on a small scale due to the small number of citizens involved.

Third, information and participation have their limits in the complex field of climate change policy. Even for climate experts, it is difficult to understand the interrelationships involved and derive recommendations for action. This is not a reason to neglect information and participation, but an argument to improve their quality. The mere expansion of information access often leads to data overload. Therefore, the dissemination of target group-specific information is crucial. Deliberative formats that focus on transformative processes

of shared opinion formation in the interest of the common good and involve citizens in the identification of issues and in effective implementation have the potential to improve the acceptance, legitimacy and quality of policies. However, this requires good preparation, participatory know-how and time resources, the involvement of key actors from the outset, and transparency as well as honesty about the scope and results of participation.

PART 4
Conclusion



Which Factors Influence Climate Policy Integration? Insights from Italian and Austrian Cases

Federica Cittadino, Louisa Parks, Peter Bußjäger and Francesca Rosignoli

This volume has documented what is described in the Introduction as the “glocal” turn in climate governance”. The complexity of climate change is not limited to the scientific conundrum of what actions are needed to avoid tipping points and maintain increases in average global temperatures below 2°C, or preferably 1.5°C, but also, as evidenced in this volume, to the intricacy of its governance. Climate change is regulated at different levels of government, from the international to the local, and, most fundamentally, is not a unitary subject matter. Mitigation and adaptation macro-goals need to be realized in the context of traditional policies, which in some key sectors, such as transport, energy and water, and spatial planning, are heavily influenced by subnational policy-making. Hence, the importance of the subnational level.

Notwithstanding the formal division of powers described in Chapters 2 and 3, this volume has demonstrated that classical debates on the division of competences between the national and subnational levels are not conclusive when it comes to explaining how climate policy integration (CPI) is realized at subnational level. Climate policy measures have so high a degree of policy complexity, with one single issue touching upon different powers, that the question of which policy level is competent to address climate change not only has to be determined on a case-by-case basis but also has no explanatory powers when it comes to understanding how CPI unfolds. CPI needs to be studied at the micro-level with attention to the formal and informal dynamics that underpin policy-making in climate-related matters. Hence the need to examine how CPI is realized in the study areas that we selected due to both their geographical and institutional characteristics, i.e. the Autonomous Provinces of Trento and Bolzano in Italy, and the *Länder* Tyrol and Vorarlberg in Austria.¹

¹ See Introduction and Chapter 3 in this volume.

In the following, we evaluate the findings that emerge from the chapters of this volume to respond to the research questions posed in the Introduction: 1) How is CPI realized in the selected case studies? and; 2) What are the factors that influence CPI? The crucial role of subnational governments in realizing CPI is equally relevant to both mitigation and adaptation measures.² Although some reference to adaptation is made in all chapters, we decided to focus mainly on climate policies related to mitigation efforts. The main reason for this is that the development of adaptation strategies in the territories analyzed is still in its infancy, with the exception of Vorarlberg which has a more advanced framework in place. The points that we raise in the following, however, may be relevant for the development of adaptation policies in the territories analyzed.

1 How Is CPI Realized in the Case Studies?

In the study areas, the mitigation of climate change is both widely present as a cross-sectoral policy objective and in sectoral strategic, legislative, and administrative acts, with some important differences.

Concerning cross-sectoral policy documents, the only subnational piece of legislation dedicated to climate change in the four case studies is the one adopted by the Autonomous Province of Trento (L.P. 5/2010, then replaced by article 23 of L.P. 19/2013). Trento has also prioritized climate change through the adoption of two cross-sectoral strategies, namely the Environment and Energy Plan (*Piano energetico ambientale provinciale – PEAP*), which contains mitigation objectives in line with EU legislation, and the Sustainable Development Strategy (*Strategia provinciale per lo Sviluppo Sostenibile – SproSS*), which includes objectives related to the reduction of greenhouse gas (GHG) emissions and adaptation to climate change.³ The Autonomous Province of Bolzano has not legislated on climate change, but in 2011 adopted instead the so-called Climate and Energy Plan – South Tyrol 2050 (*Klimaplan Energie – Südtirol 2050*, as amended by *Klimaplan Südtirol 2040*), currently under revision. The differing nature of the measures adopted in the two Autonomous Provinces

2 See, for instance, M.-L. Lambert *et al.*, *Adapter les territoires au changement climatique : Outils juridiques d'urbanisme et d'aménagement* (Territorial éditions 2020).

3 As reminded in Chapter 3, the Strategy for Climate Change Mitigation and Adaptation (*Strategia provinciale di mitigazione e adattamento ai cambiamenti climatici*) is under adoption in the Province of Trento in line with the process laid down in the strategic paper Trentino Climate 2021–2023 (*Trentino Clima 2021–2023*).

cannot be explained with reference to the constitutional division of powers, which as clarified in Chapters 2 and 3, does not confer general environmental powers to Italian regions, be they ordinary or special.

In Austria, similarly to the Province of Bolzano, the *Länder* analyzed have adopted no specific law dedicated solely to climate change, probably due to the entrenchment of climate change within a number of policy fields that fall under the competence of both the *Bund* and the *Länder*. Indeed, a comprehensive climate law⁴ exists at the national level, unlike Italy. Furthermore, the protection of climate is entrenched as a *Land* aim (also referred to as a state aim in this volume) in the subnational constitutions of both *Länder* (for Vorarlberg since 2008). This legal recognition, as recalled in Chapters 2 and 3, has not so far had any specific legal consequences. However, the theoretical possibility to challenge the constitutionality of *Land* laws for violating this aim remains open. Furthermore, while Tyrol adopted, similarly to the Italian cases, cross-cutting strategies in the field of climate change (*Tirol 2050* in 2014, which contains commitments to reach energy autonomy and climate neutrality; Climate Strategy for *Land* Tyrol – *Tiroler Nachhaltigkeits- und Klimastrategie* in 2021, which is more implementation-oriented and contains specific sectoral targets, also in the field of adaptation), Vorarlberg has no general strategic document in place to guide the mitigation of climate change in the years to come.⁵ This is probably due to the fact that Vorarlberg's activism in the field of energy autonomy, efficiency and greening of energy sources started as early as 2007 and has shaped subsequent strategic developments in the field of climate change mitigation. At the same time, Vorarlberg is the only subnational government to implement a fully-fledged adaptation strategy with related action plans that need to be updated yearly. Tyrol has instead adopted sectoral adaptation goals within the context of its abovementioned climate strategy, which do not however contain any implementing measures.

In addition to cross-sectoral measures, sectoral strategic documents also play an important role in CPI in all the case studies, with even less variation than discussed in previous paragraphs. In the Autonomous Province of Bolzano, climate change is integrated in sectoral legislation, strategies, programs (such as *CasaClima*),⁶ and initiatives (such as Green Mobility),⁷ especially in the fields

4 *Klimaschutzgesetz* – KSG, BGBl. I Nr. 106/2011, consolidated version as of 24 June 2022.

5 However, the climate strategy of Land Vorarlberg is based on three main objectives, namely energy autonomy, sustainable land use, and adaptation to climate change. See <https://www.energieautonomie-vorarlberg.at/de/das-ist-energieautonomie/>. All internet sources in this chapter were accessed on 25 June 2022.

6 See Chapters 3 and 5 in this volume.

7 See Chapters 3 and 4 in this volume.

of energy, water, and landscape policies. The same is true for the Autonomous Province of Trento, although spatial and urban plans contain no explicit reference to climate change. In Austria, CPI in sectoral documents occurs both at the level of legislation (in the fields of air pollution, energy, spatial planning, and building) and of strategies (for instance in the latest sectoral strategies on spatial planning in Tyrol, and in the Energy Autonomy + Strategy 2030 – *Strategie Energieautonomie + 2030* in Vorarlberg).

Concerning CPI in specific sectors in more detail, transport is one of the most critical areas of intervention in the case studies, since it is the sector with the highest level of emissions in the region.⁸ The authors of Chapter 4 show a substantive alignment of the objectives adopted at subnational level, with a focus on less emission-intensive modes of transportation. Criticalities also tend to be similar, with a considerable gap between declared objectives and the achievement of a full shift from road to alternative modes of transport, which would allow the decarbonization objectives agreed upon at European level to be achieved.

As highlighted in Chapter 1, energy is also a particularly sensitive sector for climate multilevel governance because Member States retain sovereignty over energy policies, and subnational governments share powers with the national level in regulating the energy sector. Chapter 5 shows that CPI is realized via objectives on the increase of renewable energy sources (RES) and more operational standards in the field of energy efficiency, for instance in buildings. A slight advantage for the Italian case studies is noted when it comes to energy autonomy, which is more established in the Autonomous Provinces than in the Austrian *Länder*. In both Autonomous Provinces hydropower is widespread and contributes significantly to energy autonomy, with Bolzano producing 92% of its electricity locally. Vorarlberg and Tyrol have both committed to reaching energy autonomy by 2050 but they still have a long way to go. Concerning the trade-off between energy and water, instead, the opposite trend is observed, with the Austrian *Länder* more advanced in terms of adaptation plans with regard to water.

As emerges in Chapter 6, spatial planning is to some extent an overarching sector since it includes provisions that have an effect on both energy (for instance where RES plants are located or building standards) and transport policies (measures concerning the limitation of traffic in residential areas). This is probably the area where, from a constitutional point of view, the subnational

8 *Rapporto sul clima Alto Adige* (Eurac Research 2018), at 30; *Climate Action Plan 2.0* (Alpine Convention 2021), at 8.

governments analyzed have the widest scope for action. This scope also extends to the municipal level, which holds responsibility for implementing provincial and *Land* plans concerning land use or regulation of traffic areas. It is worth noting that while in the Autonomous Province of Bolzano, the integration of climate-related standards is usually achieved through the prevalence of hazard zone plans, landscape plans, and the Stelvio National Park Plan over provincial land use plans and other spatial instruments, in the Autonomous Province of Trento landscape and hazard maps are an integral part of the Provincial Urban Plan (*Piano urbanistico provinciale*). The same holistic approach can be found in Vorarlberg and Tyrol.

Differences among the sectors are also reflected in the varying nature of the measures adopted. In the transport sector, we can observe a mix of federal laws and executive acts/strategies at the subnational level in Austria, while in Italy there is a legislative framework in place at the subnational level. In the energy sector there is a prevalence of strategic and economic instruments in both the Italian and Austrian cases. In spatial planning, relevant legislative frameworks are in place at the subnational level, but CPI mostly unfolds in sectoral plans. While strategies and long-term objectives are well established in all three sectors (perhaps less so in the field of spatial planning in Italy), implementation has not however reached its full potential and must be improved.

Another relevant point is whether there is an overall harmonious approach to CPI despite institutional differences. As said, there is substantive convergence among strategic objectives, with slight variation in terms of the nature and content of the measures adopted. From an institutional point of view, very differently from the Italian regional system, as emerges in Chapter 2, the overlapping of competences in the federal system of Austria is consolidated. Mechanisms also exist to dynamically change the formal division of competences; for instance, formally, through competence clauses and, *de facto*, through *Privatwirtschaftsverwaltung* (private sector administration). The latter includes manifold activities promoted by either the *Bund* or the *Länder* to subsidize climate-friendly behavior. These significant institutional differences do not, however, lead to comparable significant differences in how CPI is realized in the selected case studies, as one might expect. Again, this might be due to the strong imprint given to long-term climate policy objectives by the European Union (EU).

Similarly, despite the fact that activism in Vorarlberg temporally precedes CPI in the other case studies, no significantly different level of CPI in this *Land* is apparent. To recall, the constitutional entrenchment of climate protection is present in both Austrian *Länder*, and the strategic objectives are aligned with those of the other case studies. Perhaps the most significant differences in

Vorarlberg are the earlier commitment to energy autonomy by 2050, made in 2009, and the development of a fully-fledged adaptation strategy with operational implementation mechanisms.

2 Which Factors Influence CPI and in What Ways?

The question of how CPI is realized at the subnational level is entrenched in the question of which factors are able to facilitate or hinder CPI. In the following, we discuss the five dimensions we hypothesized as relevant to CPI (coordination, participation, information, leadership, and funding), first separately, and then with a view to understanding their mutual interrelationship.

2.1 Coordination

As highlighted in Chapter 7, the importance of coordination is premised on the complexity of both climate change as a policy issue and on the policy-making procedures in place in decentralized countries. Coordination in CPI is relevant both in terms of its vertical dimension, as the need for mechanisms of interaction among different levels of government that are equally entitled to regulate climate change, and its horizontal dimension, which accounts for the fact that climate change is not a unitary subject matter but instead intersects with a number of different policy sectors and because “no single policy sector alone can win the challenges represented by climate change”.⁹

2.1.1 Vertical

Concerning vertical coordination, while constitutional principles that require cooperation among levels are enshrined in both the Italian and the Austrian constitutional systems (loyal cooperation under article 120 of the Italian Constitution and *Berücksichtigungsprinzip* – the principle of mutual consideration in Austria), important differences emerge as to the existence of formal mechanisms of vertical coordination for CPI. Italy has no formal mechanism of vertical coordination dedicated to climate matters. Austria instead has instituted the National Climate Protection Committee (*Nationales Klimaschutzkomitee*),¹⁰ composed of representatives of the *Bund*, *Länder*, and non-institutional stakeholders, which was established by law to facilitate the implementation of the abovementioned Austrian Climate Change

⁹ Chapter 7 in this volume.

¹⁰ See Chapter 8 in this volume.

Act (*Klimaschutzgesetz*). Even in terms of coordination mechanisms without a specific climate mandate, the Austrian Conference on Spatial Planning (*Österreichische Raumordnungskonferenz – ÖROK*),¹¹ composed of all federal ministers and heads of the *Länder*, the presidents of the Austrian Association of Cities and Towns (*Städtebund*) and the Austrian Association of Municipalities (*Gemeindebund*), as well as relevant social and economic organizations, is an example of a formal sectoral coordination body that has no correspondent body in the Italian system. In more general terms, it should be highlighted that Austria has a more consolidated system of vertical cooperation and entrenchment among government levels, which is part of its constitutional framework. It suffices to think of both the Federal Council (*Bundesrat*), the upper house of the Austrian Parliament representing the *Länder*, and the so-called article 15a B-VG *Bund-Länder* agreements,¹² which are legally binding on the parties and may establish *ad hoc* forms of cooperation. The Italian system of conferences, described in Chapter 7, is by no means comparable to the Austrian experience, either in terms of its mandate or its functioning.

Vertical coordination also means cooperation with additional layers of government beyond the national, including the EU level and municipal levels. Coordination with the EU level is essential for CPI and is reflected in the substantive alignment of subnational climate-related policies to EU objectives and requirements. As emerged from Chapter 2, national climate-related strategies are often adopted as requirements of EU legislation. Furthermore, despite the view of some respondents that in Italy the state is fundamental in transposing European standards into national ones,¹³ the implementation of EU standards is also carried out directly by subnational governments in all cases. Regarding coordination between subnational and local governments, in all cases municipal urban plans are theoretically bound by requirements established at either provincial or *Land* levels. It has however been observed that more coordination would be preferable when municipalities adopt climate-related standards in their fields of action, such as local spatial planning and traffic management. An example of effective coordination is apparent in the Austrian cases, where *Land* authorities organize training to guide municipal implementation.¹⁴

11 See Chapter 6 in this volume.

12 See art. 15a of the Austrian Federal Constitutional Law (*Bundes-Verfassungsgesetz – B-VG*). See Chapters 5–7 in this volume.

13 See Chapter 7 in this volume.

14 See Chapter 3 in this volume.

2.1.2 Horizontal

Horizontal coordination is crucial because, as said, climate change is not a standalone subject matter, and measures that impact mitigation and adaptation standards are likely to be introduced by climate-related sectoral policies. The analysis conducted in this volume demonstrates that coformulation of strategic documents by sectoral policy-makers and policy officers occurred in all of the case studies. This took place via formal (both cross-sectoral and sectoral) and informal mechanisms of horizontal coordination.

Concerning formal cross-sectoral mechanisms, in the Provinces of Trento and Bolzano existing environmental departments (respectively *Agenzia provinciale per la protezione dell'ambiente* – APPA Trento¹⁵ and *Agenzia provinciale per l'ambiente e la tutela del clima* – APPA Bolzano) have assumed a coordinating role in the elaboration of climate-related policies within their more general mandate on the protection of the environment. According to some interviewees APPAs are not fully operational as coordination units because they are themselves provincial departments with a discrete scope for action with respect to other provincial departments. Another form of non-institutional horizontal coordination in the Province of Bolzano in the field of spatial planning will be the Provincial Strategic Plan (*Piano strategico provinciale*), which will be adopted in 2023 and replace the current leading document on spatial planning (*Piano provinciale di sviluppo e coordinamento territoriale* – LEROP) by taking into account, *inter alia*, the objectives of reduced use of soil and energy and the promotion of RES.¹⁶

In Austria, the *Länder* analyzed have instead created *ad hoc* formal coordination mechanisms, i.e. the Sustainability and Climate Protection Coordination Unit (*Fachbereich Nachhaltigkeits- und Klimakoordination*) in Tyrol¹⁷ and the Energy and Climate Protection Division (*Fachbereich Energie und Klimaschutz*) in Vorarlberg. Furthermore, both *Länder* have instituted climate coordinators, which however only have an overview of the measures enacted and are not able to steer action on climate protection.¹⁸

15 The coordinating functions of APPA Trento were not introduced until 2020. Before this date, horizontal coordination in the Province of Trento was ensured by an ad-hoc coordination table on climate change (*Tavolo Provinciale di Coordinamento e di Azione sui Cambiamenti Climatici*, today chaired by APPA Trento). See Chapters 3 and 7 in this volume.

16 L.P. 9/2018, artt. 2 and 43 and IntBZ_01.

17 This unit meets regularly, within a steering committee composed also of politicians, with the Energy Coordination Unit, and the heads of climate-related sectoral departments. See Chapter 7 in this volume.

18 See Chapter 7 in this volume.

To different extents, all of these climate-specific coordination institutions have favored intra-sectoral dialogue and CPI in sectoral policies. However, more efforts to reinforce their mandates and their scope for action *vis-à-vis* other sectoral departments would ensure a stronger impetus for climate policies at the subnational level, and therefore more established leadership.

Additional formal mechanisms of coordination between subnational governments or between municipalities may also be relevant in the context of CPI. In Austria, under article 15a(2) B-VG, binding agreements can also be concluded among *Länder* in the respective competence matters.¹⁹ This provision allows, at least in theory, for horizontal coordination to be ensured, for instance in cross-border regions sharing similar climate issues.²⁰ No similar binding options exist in Italy, where interregional relationships are often driven by competition rather than cooperation, especially when it comes to autonomous regions. Cross-border cooperation among subnational governments is also achieved within the context of the European Grouping of Territorial Cooperation (EGTC) Euregio. Established in 2011, it promotes cooperation between Tyrol and the Autonomous Provinces of Trento and Bolzano, especially on mobility issues and the reduction of GHG emissions (for instance through the so-called Euregio Hydrogen Strategy).²¹

Intermunicipal cooperation is another form of horizontal coordination that may have relevance for climate protection. For instance, in Austria, the e5-program (*e5-Programm*) is a federal framework that supports Austrian municipalities in the modernization of their climate and energy policies, thus somehow leveling the way in which CPI is realized by the local authorities that take part in the program.²² Coordination between municipalities is instead mandatory for supra-local spatial planning,²³ whereas planning at cross-municipal level is an established practice in Vorarlberg. In Italy, coordination among municipalities on climate matters occurs mostly within the framework of the Covenant of Mayors, and is therefore driven by the initiative of single local authorities rather than supra-municipal programs of subnational or national relevance.

19 *Ibid.*

20 A relevant example is a 15a(2) agreement establishing cooperation on building matters, available at https://www.ris.bka.gv.at/GeltendeFassung.wxe?Abfrage=LrVbg&Gesetze_snummer=20000743.

21 *Strategia per l'idrogeno Euregio*, available at <https://www.europaregion.info/it/euregio/progetti/sostenibilita/strategia-per-lidrogeno-euregio/>.

22 See Chapter 3 in this volume.

23 See Chapter 6 in this volume.

In addition to formal mechanisms of horizontal coordination, informal mechanisms emerge as an important factor for CPI: these are activated in all case studies, usually as a result of consolidated personal relationships among administrative officers or policy-makers, and as part of sectoral and cross-sectoral strategic planning processes. As emerged from some interviews, informal cooperation in strategic plans usually leads to rather vague policy objectives that lack implementing measures. It is the shared opinion of most interviewees from all study areas that climate change requires more permanent coordination mechanisms (in addition to those described as formal above), more permanent staff in the administrative units concerned with climate change, more staff dedicated solely to the purpose of coordination for climate matters, and some level of innovation in policy-making practices that extends beyond the logics of separate competence matters.

2.1.3 Evaluation

In light of the above, the functions of vertical and horizontal coordination in enabling CPI in our case studies are slightly different from what is usually hypothesized in the literature.²⁴ For instance, none of the existing coordination mechanisms in the case studies helps subnational authorities avoid the duplication of policies adopted at different levels. In contrast, general objectives, such as the 55% reduction in GHG emissions by 2030, are reiterated at all levels, though this is not an obstacle to increased and coherent CPI. Related to this, the case studies do not provide enough evidence to claim that coordination prevents policy fragmentation. In this respect, our cases suggest that more problems with respect to fragmentation may stem from inconsistent climate-related policies adopted at different levels, or in different climate-related sectors. This is true especially when climate protection is the result of policies that have other primary aims for sectoral policies, or when climate is only one of the aspects to be considered among different, or even conflicting aims. In this sense, we observe that, although coordination mechanisms exist to different

24 T. Rauken *et al.*, "Mainstreaming Climate Change Adaptation at the Local Level", *Local Environment*, 20 (2015) 408–423; A. Ross and S. Dovers, "Making the Harder Yards: Environmental Policy Integration in Australia", *Australian Journal of Public Administration*, 67 (2008) 245–260; P. Mickwitz *et al.*, *Climate Policy Integration, Coherence and Governance* (PEER report 2 2009); S. Brouwer *et al.*, "Mainstreaming Climate Policy: The Case of Climate Adaptation and the Implementation of EU Water Policy", *Environment and Planning C: Government and Policy*, 31 (2013) 134–153; C. Wamsler and S. Pauleit, "Making Headway in Climate Policy Mainstreaming and Ecosystem-Based Adaptation: Two Pioneering Countries, Different Pathways, One Goal", *Climatic Change*, 137 (2016) 71–87.

extents, climate protection, especially in the case of spatial planning and transport policies, is still the unintended consequence of other policy objectives rather than a primary aim in and of itself. Therefore, coordination does not necessarily succeed in avoiding inconsistencies or preventing fragmentation, although we did not document any evident mismatch between European, national and subnational standards, on the one hand, or among sectoral policy objectives, on the other. Probably one of the most obvious trade-offs among policy areas is between the promotion of RES and the objectives of enhancing the quality and quantity of water resources. Finally, we found some limited evidence that vertical cooperation may enable mutual learning, for instance by anticipating commitments at subnational levels that are then either extended to the whole national territory or required at the EU level.²⁵

2.2 Participation

Participation has certainly had some influence on CPI in all of the case studies, not least because institutional participatory procedures preceded almost all processes leading to the adoption of climate-related cross-sectoral or sectoral strategic documents. The following discusses the practices, forms, and actors of participation, their internal idiosyncrasies, and their level of correlation to CPI.

2.2.1 Practices²⁶

In all case studies, we can distinguish between binding and non-binding forms of institutional participation. Binding forms of participation are usually related to specific sectors and are mostly directed to a restricted parterre of stakeholders rather than the general public. In the Austrian case of Vorarlberg, only professional associations (such as the Chamber of Commerce), municipalities, residents, and local companies have a right to comment on spatial plans or road concepts. This right is extended to the general public for noise maps and action plans in Tyrol. In both *Länder*, the right to take part in technical advisory bodies that inform public decision-making in spatial planning and nature conservation is reserved to a number of stakeholders, including environmental organizations and experts. Participation in the development of water/flood management plans is instead extended to all citizens.

25 Chapter 3 refers to the fact that *Land Lower Austria (Niederösterreich)* banned new oil heating systems in 2019 and the same ban was then introduced at the federal level; in Chapter 5: the target of reducing GHG emissions by 55% in 2030 was introduced by the Province of Trento in the proposed PEAP before the new EU Climate Law was adopted.

26 See Chapters 6 and 9 in this volume.

In both the Autonomous Provinces in Italy, the main binding procedures are those of environmental impact assessments (EIA) and strategic environmental assessments (SEA), where specific environmental stakeholders may submit written comments. For instance, in the Province of Bolzano, one of the environmental assessment procedures most participated in was one concerning the elaboration of the Water Protection Plan (*Piano di tutela delle acque*), which received two hundred and fifteen comments. In the Province of Trento, a notable example of a mandatory consultative process directed to selected stakeholders is the one that preceded the adoption of the PEAP (*Piano energetico ambientale provinciale*). Despite the structured form of this consultation and the broad parterre of stakeholders involved (from high school students to businesses), the process was criticized by some interviewees from civil society as non-inclusive, because environmental organizations decided to abandon the participatory process due to negative past experiences with the administration.²⁷ Binding forms of participation are also envisaged at the municipal level, in the forms of inquiries, consultations, motions, citizens' initiatives, and petitions.²⁸

Concerning voluntary forms of participation, these are usually *ad hoc* processes in the context of sectoral or cross-sectoral strategic development. Concerning the Austrian cases, in Tyrol comments from selected stakeholders were collected and then evaluated as part of the development of both the Spatial Plan Habitat Tyrol – Agenda 2030 (*Raumordnungsplan Lebensraum Tirol – Agenda 2030*) and of criteria for the use of hydropower. An interesting example that goes beyond information sharing and consultation is the participatory process preceding the adoption of the Tyrolean Sustainability and Climate Strategy (*Leben mit Zukunft – Tiroler Nachhaltigkeits- und Klimastrategie*).²⁹ Not only did the participatory process include the general public, but there is evidence that comments were integrated into the final formulation of the strategy. Furthermore, an evaluation of progress is to be carried out annually with the participation of selected stakeholders.

In Vorarlberg, the adoption of two important strategic documents, *Raumbild Vorarlberg 2030* and the abovementioned Energy Autonomy + Strategy 2030, was preceded by a two-step consultation process, first with experts, then with the general public (online or in-person). For the freight transport concept,

27 See Chapter 5 in this volume.

28 See Chapter 9 in this volume.

29 https://www.tirol.gv.at/fileadmin/themen/landesentwicklung/raumordnung/Nachhaltigkeit/Nachhaltigkeits-_und_Klimakoordination/Publikationen/Massnahmenprogramm_web.pdf.

instead, only interest groups and businesses were involved. A relevant example of a participatory process that goes beyond information and consultation is the model of Citizens' Councils (*Bürgerräte*). These can be initiated at the request of alternatively the government, the parliament, or at least one thousand citizens, and are usually used to promote a public debate on complex issues affecting the common good. Important structural elements are the random selection of participants (usually twelve to twenty participants), the facilitation of debates by professionals, and the free determination of the points to be discussed with or without the consultation of experts. After a first round of internal discussions, proposals elaborated within the context of Citizens' Councils are then presented to the public, including politicians, administrators, and interest groups. The feasibility of proposals is examined by public officers and finally forwarded to the parliament, which decides whether to adopt it, with or without amendments, or not. In 2020, the Citizens' Council on Vorarlberg's climate future (*Bürgererrat: Klima-Zukunft*) was initiated at the initiative of a group of citizens and went into operation. The contribution to the Mobility concept of 2019 (*Mobilitätskonzept Vorarlberg 2019*) and the Energy Autonomy Strategy + of 2009 were structured in a similar way.

In Italy, in the Autonomous Province of Trento, a citizens' initiative on sustainable mobility was launched in 2014, which resulted in a proposed bill that was not however taken forward by the administration (instead L.P. 6/2017 was adopted).³⁰ Another notable example of voluntary participation occurred in the formulation of the abovementioned Sustainable Development Strategy in the Province of Trento, where the widest participation possible was promoted in several steps. First meetings with school and university students were organized; subsequently, experts made proposals that were then incorporated into a draft that was open to on-line comments. The final step was the organization of workshops with stakeholders from institutions and civil society. In the Autonomous Province of Bolzano, one of the most relevant examples of a voluntary participatory process in the field of climate change was initiated by the provincial government for the revision of the Climate and Energy Plan – South Tyrol 2050. Participation took place between 2020 and 2021 but only in the form of written online comments. These will be evaluated by a committee of six experts.³¹ The consultation of experts in the same process, instead, took place in a separate and less transparent way.

30 See Chapter 4 in this volume.

31 See Chapter 9 in this volume.

Finally, in all cases we found specific forms of consultation targeted towards scientific experts, where scientists are requested to provide information to public administrations with the aim of improving the responsiveness of climate-related public policies to scientific data. This may occur either as part of information exchange events (for instance conferences of experts in the transport sector and in other selected policy sectors in Austria)³² or of more permanent fora. As examples of the latter, the Province of Trento will establish a scientific committee to improve exchange between scientists and policy-makers in the context of the workplan *Trentino Clima 2021–2023*.³³ In Tyrol, the same exchange is achieved through the *Plattform Klima, Energie und Kreislaufwirtschaft*. A final example is the Italian National Network System for the Protection of the Environment (*Sistema Nazionale a Rete per la Protezione dell'Ambiente*), coordinated by the Institute for the Environmental Protection and Research (*Istituto Superiore per la Protezione e la Ricerca Ambientale – ISPRA*). In this network, data collected by all regional and provincial environmental agencies are jointly examined with the aim of supporting public decision-making. Data are also made available to the wider public through public reports and other documents available on the dedicated website.³⁴

2.2.2 Evaluation

Whether institutional participation is a driving force for CPI, as theorized by scholars,³⁵ is a question that remains open. The level of correlation between participation and CPI in the study areas was not fully determined in this study. Our main interest in looking at different types of participation was to actually determine whether this is correlated with increased CPI. To the extent that the case with the longest history of CPI also has the most established tradition of participation (Vorarlberg), while CPI varies in other cases along with different attempts at participation, this appears to be true. Nevertheless, their ubiquity of such attempts across the cases also suggests that rather than a key driver of CPI *per se*, these are carried out to fulfill obligations from the Aarhus Convention, or to enhance legitimacy. The variation in the types of

32 See Chapters 3 and 7 in this volume.

33 See footnote 3 above.

34 See <https://www.snppambiente.it/>.

35 L. Parks, *Benefit-Sharing in Environmental Governance: Local Experiences of a Global Concept* (Routledge 2020); J. Knieling (ed.), *Climate Adaptation Governance in Cities and Regions: Theoretical Fundamentals and Practical Evidence* (Wiley Blackwell 2016), at 10; K. Backstrand and E. Lovbrand, "The Road to Paris: Contending Climate Governance Discourses in the Post-Copenhagen Era", *Journal of Environmental Policy & Planning*, 21 (2017) 519–532.

participatory processes in our cases suggest some more nuanced findings in this vein that point to the importance of the design and intent of participatory processes for the quality of CPI. It is also certain that participation usually precedes climate-related policy developments. In the following, we illustrate interesting results on the nature, functions, methods, effects, triggers, actors, and structure of participation in the study areas.

On the issue of how participation is intended in the study areas, we found that in all case studies there is a common strong focus on participation for the purposes of sharing information rather than for policy-making. The mechanisms examined mainly enable the sharing of information with selected stakeholders or the broader public, rather than the inclusion of citizens' proposals in public decision-making. In line with theories of civic environmentalism,³⁶ participation is promoted by administrations mainly to enhance the legitimacy and acceptability of policies. While participation is seen by the administration as a tool to promote legitimacy, the interviews with civil society representatives revealed that citizens and civil society organizations (CSOs) are generally disappointed with how participation is conducted. CSOs tend to view participation as a route for influencing policy-making, in line with discussions in the literature on, for example, ecological democracy.³⁷

Concerning the methods of participation, the literature usually distinguishes between consultative and deliberative practices. In all case studies, participation occurs mainly in the form of consultation. Deliberation, intended as a process where actors involved exchange their arguments and come to an agreed solution or to a common understanding of a complex problem like climate change, is less common. The sole example of deliberation is that of the Citizens' Councils in Vorarlberg. However, as observed in Chapter 9, "Citizens' Councils primarily fulfil a legitimization function by increasing citizens' backing and acceptance of political decisions and their will to engage, as well as by changing personal attitudes to an issue". Be it conducted as a consultative or a deliberative process, the consequences of participation in the study areas, including the impact of Citizens' Councils on public decision-making, are far from clear. In particular, it is not clear how and to what extent the contributions and proposals made by citizens and CSOs are eventually integrated into policy documents. This is true even for the more deliberative processes, such as the Citizens' Councils in Vorarlberg, or for the most inclusive participatory processes promoted in the Province of Trento for the elaboration of

36 K. Backstrand and E. Lovbrand, "The Road to Paris", *supra*.

37 See e.g. H. Stevenson and J. S. Dryzek, *Democratizing Global Climate Governance* (Cambridge University Press 2014).

the Sustainable Development Strategy. In this respect, participation appears to be conceived by subnational authorities as an element of traditional decision-making, meaning that, even in the field of climate change, it only contributes to the normal functioning of legislative and administrative processes. This suggests that rather than the deliberative view where participation could be thought of as contributing to create CPI, our cases indicate instead a role for participation in effective implementation through raising legitimacy and awareness.

Regarding the triggers of participation, i.e. how actors' participation is initiated, the participatory processes encountered in Vorarlberg and in the Province of Trento may be either bottom-up – activated by citizens and CSOs – such as the abovementioned citizens' initiative on mobility in Trento and the Citizens' Council on climate change in Vorarlberg, or top-down – activated by the administration. In Tyrol and the Province of Bolzano, instead, initiative is usually taken by the administration. Even when participatory processes are initiated by citizens, proposals are not usually retained in final policy documents, thus confirming the conclusion highlighted above that what is lacking is a clear understanding of how participation is incorporated into final decisions.

Concerning the subjects involved in participatory processes, although participation in environmental matters is a right as established by the Aarhus Convention (to which Italy and Austria are both parties),³⁸ in all case studies, with the exception of binding processes where the addressees of participation are determined by legislation, administrations decide who is involved in participatory processes, often with no transparency regarding the criteria. As seen, participatory processes are not usually extended to the general public, and are therefore mediated by CSOs, professional organizations, expert groups, and businesses. Though beyond the scope of this study, this begs the question as to whether organized groups are bridges or obstacles to direct participation by citizens. The literature on civil society is divided on this point: while studies on more formal interest groups and NGOs point to their role as brokers, representatives, and transmission belts to bring citizens' perspectives to decision-makers,³⁹ critical scholars underline that such organized brokerage threatens the emergence and advocacy for more radical governance ideas,⁴⁰ which are

38 See Chapter 9 in this volume.

39 L. Parks, *Benefit-Sharing in Environmental Governance*, *supra*; M. Kaldor, *Global Civil Society: An Answer to War* (Polity Press 2003); M.E. Keck and K. Sikkink, *Advocacy Networks in International Politics* (Cornell University Press 1998), available at <http://www.jstor.org/stable/10.7591/j.ctt5hh13f>.

40 A. Choudry and D. Kapoor, *NGOization: Complicity, Contradictions and Prospects* (Zed Books 2013).

increasingly called for in the area of climate change.⁴¹ With reference to this more critical interpretation, which implies a clear difference between participation as a formally organized activity and participation through more unstructured means such as protest, a broad body of literature on collective action has noted the rise of European youth movements for climate change since 2019, in particular in the form of Fridays for Future.⁴² This suggests that in addition to, or instead of, a possible disenchantment with formal participation processes, young people have an active preference for more contentious forms of participation on the issue of climate change.

Another issue that was not explored in this study but would be interesting to delve into is the relative weight of different stakeholder or civil society groups, i.e. both whether some of these are more present than others, and whether some actors' proposals are retained more often in final decisions. The latter point, however, is not easy to investigate since there is not always transparency on the positions of different groups and no clarity on which positions are included in policy-making.

Notwithstanding the prevalence of processes that privilege the participation of organized groups and selected stakeholders, in all study areas there are interesting examples of participation in climate-related decision-making processes that involve all citizens. Citizens are usually involved in a later phase of the participatory processes whether in one-day events or in more lengthy consultative processes, though these are usually in the form of written comments. Two interesting peculiarities emerged in the Italian cases. In the Province of Trento, many participatory processes have involved youth (high school or university students). Notwithstanding the efforts put in place by the administration to target young people, youth are seen as not engaging in participatory mechanisms to the levels wished, and there is a perceived need to find ways to attract young people to take part in climate-related participatory processes. In the Province of Bolzano, instead, some interviewees have interestingly claimed that participatory processes are not always successful because participation takes the form of political participation, mediated by traditional political parties. This might be due, as pointed out by respondents, to the fact that the same political party has been in power for many years.

Another interesting issue concerns the phase in which policy decision-making participation is required or takes place. A common result emerging

41 See e.g. B.C. Chaffin *et al.*, "Transformative Environmental Governance", *Annual Review of Environment and Resources*, 41 (2016) 399–423.

42 See e.g. J. de Moor *et al.*, "New Kids on the Block: Taking Stock of the Recent Cycle of Climate Activism", *Social Movement Studies*, 20 (2021) 619–625.

from all the cases is that participation usually precedes the development of strategic policy documents, but is completely lacking in the implementation phase. This adds some nuance to the idea of participation for legitimacy and enhanced efficiency in implementation suggested earlier. The suggestion from our cases is that legitimacy is sought at a more general strategic level rather than in connection to the implementation of specific policies. An exception to this trend seems to be the participatory process provided to monitor the implementation of the Sustainability and Climate Strategy in Tyrol. Moreover, although it did not emerge explicitly from the interviews, participation intended as consultation from experts seems to be an important factor in coordination (in line with the literature) and a way to improve policy-making.

Yet another interesting result concerns the question of whether or not participation is supported by any dedicated structure. In Vorarlberg and in the Province of Trento, there are dedicated offices for participation that facilitate processes (respectively *Büro für Freiwilliges Engagement und Beteiligung* and *Autorità per la Partecipazione Locale*). Vorarlberg has also created specific funds to promote the participation of citizens in projects relevant to climate change.⁴³ No such authorities exist in *Land* Tyrol or the Province of Bolzano. The presence of structures that facilitate participation seem to be linked to the more established nature of participatory processes in Vorarlberg, which according to interviewees has a more consolidated culture of participation. Although notions of political and participatory culture are complex⁴⁴ and raise myriad issues that cannot be fully accounted for in this study, additional research questions concern the extent to which a more established structure may lead to a more established culture of participation, or whether structure and culture are independent variables. A hint that structure and culture are interrelated may come from the increased openness in the Province of Trento to participation, which is backed, like Vorarlberg, by a dedicated office. On the other hand, although a legislative framework on participation exists in the Province of Bolzano (L.P. 22/2018), this structure has not led to the same level of citizens' engagement in public decision-making.

Finally, what emerges clearly from all case studies, aside from the need for dedicated research on the intricacies of the impacts of participation for CPI, is that "Participation is limited by informational asymmetries".⁴⁵ Information

43 See Chapter 9 in this volume.

44 See e.g. A. Delwiche and H.J. Jacobs, *The Participatory Cultures Handbook* (Routledge 2012), at 3–9.

45 Chapter 9 in this volume.

was hypothesized to be a separate factor and is explored in the following subsection.

2.3 *Information*

As pointed out in the Introduction, information relates to the extent to which “climate change-related data and analyses are available” both to policy-makers and to the public. In our study, we decided to concentrate mainly on the latter because information for policy-makers is usually realized through consultation, and therefore we included it in our discussions of participation for this research (see above). The following discusses the main forms and examples of information in the case studies.

2.3.1 Practices

Chapter 9 rightly distinguishes between reactive (and usually binding) information, intended as a duty of public authorities to inform the public upon request, and proactive (and usually non-binding) information, which is spontaneously provided by public authorities to raise awareness on climate issues and enable participation.

The right to access environmental information is entrenched in the Aarhus Convention, but there is no constitutionally protected duty in Austria at the *Bund* level, although a constitutional amendment is currently under discussion. In the Constitution of *Land Tyrol*, instead, information is conceived as an obligation for the government to inform the population about matters of general interest, rather than an individual right. In Italy, the Constitutional Court’s position is that the right to access information is entrenched in the right to freedom of thought, protected in the Italian Constitution. The implementing legislative framework implies both a general right to environmental information, which does not require any specific interest to be demonstrated, and a duty for any administration to proactively collect and disseminate information.

Within these different theoretical frameworks, the dissemination of climate-related information to the public is achieved in very similar ways in all case studies, and namely through the publication of climate and energy reports (especially in the Austrian cases), dedicated websites (for instance, in Italy, through the websites of APPA Trento and APPA Bolzano), the organization of informative events with specific target groups including the general public, initiatives in schools, and information campaigns via social networks (the latter is more established in Vorarlberg and in the Province of Trento).

Noteworthy examples of each of the forms of information described above can be found in all of the areas studied. In Tyrol, climate reports are updated regularly pursuant to the abovementioned Sustainability and Climate Strategy.

Dedicated websites have been created *inter alia* for the Energy Autonomy Strategy + in Vorarlberg and for the Climate Plan South Tyrol 2040 in the Province of Bolzano.⁴⁶ The Province of Trento, in cooperation with scientific experts (such as the University of Trento, Fondazione Edmund Mach, Fondazione Bruno Kessler, and MUSE), has created a general information portal on climate change, the *Climatrentino* website, where climate data of regional relevance are presented and constantly updated. The Province of Trento has also produced teaching material on climate change to be used in schools. Awareness-raising campaigns are also organized in the Province of Trento as part of a general climate-dedicated initiative, the so-called *Forum provinciale per i cambiamenti climatici*. Information campaigns are furthermore promoted through traditional media, such as the Green Mobility initiative in the Province of Bolzano, which is often covered in local newspapers. Examples of targeted information events abound in the Austrian *Länder*, such as the Double Plus Program in Tyrol and the *e5-Gemeinden* program and the V-Mobil initiative.⁴⁷ In the Province of Bolzano informative events on energy policies were organized in pre-Covid times in municipalities within the context of the *ComuneClima* initiative.

2.3.2 Evaluation

As highlighted in section 2.2.2 above, information sharing lies at the core of most public participation initiatives in the territories analyzed. Given the complexity inherent in regulating climate change and the scientific uncertainties surrounding the actions needed to ensure effective mitigation and adaptation, information is certainly a key factor in enabling participation. As emerged from interviews, participation may be prevented when information is not sufficiently shared before participatory processes take place. This is reflected in the obligation to share expert reports in the course of EIA and SEA processes, but it is equally important, and perhaps even more decisive, in voluntary participatory mechanisms. The ability of the general public to effectively engage in consultative or more deliberative decision-making processes on climate matters is in particular likely to be affected in a negative way by a lack of supporting information. In this sense, the hypothesized disaffection of young people with regards to participatory mechanisms could be explained in light of the general absence of information campaigns targeting young people, as well as the preference for participation via protest actions pointed to earlier (an exception is

46 Some civil society interviewees in the Province of Bolzano highlighted, however, that relevant information often remains undisclosed and is not provided even upon request.

47 See Chapter 9 in this volume.

the Province of Trento, which for instance elaborated training materials for schools and pays particular attention to the involvement of youth). As with young people, marginalized groups, such as the elderly, migrant communities (with particular attention to the languages in which information is provided), and economically disadvantaged groups that might not have regular access to internet and social media campaigns might also need more targeted information campaigns. Finally, although information is a precondition for promoting participation and must be generally improved, alone it is certainly not sufficient to ensure participation. Information, moreover, if properly shared, may be a powerful parameter for the public to check on climate policies, demand more climate action, and, ultimately, to steer leadership.

2.4 *Leadership*

Leadership is defined in the Introduction as the existence of a “clear impetus for CPI from politicians or top-level managers” at the subnational level. The following discusses whether the case studies reveal the existence of a separate leadership additional to that ensured by the European and national levels. To this end, it shows how urgent climate change is perceived to be and depicted as such by politicians and top-level managers in the case studies, with reference to specific initiatives and political programs.

2.4.1 Forms of Leadership

First of all, the EU’s leadership position is undisputed and is referred to in numerous interviews.⁴⁸ EU leadership may take the form of some Member States pushing for more climate-friendly policies and produce emulation in other Member States (such as Germany).⁴⁹ Most importantly, however, EU legislation produces a knock-on effect on subnational policies, which in most of the cases incorporate EU standards on climate change into subnational policy documents.⁵⁰ This is particularly evident in the transport and energy sectors, but has some effects also on spatial planning due to the close link between this policy sector and transport and energy.⁵¹ In this sense, references to EU law in subnational documents are abundant.

48 In contrast, the role of the national level did not emerge as critical in terms of leadership in the interviews.

49 See Chapter 1 in this volume.

50 The extent to which subnational governments may anticipate EU developments is briefly discussed in section 2.1.3 above.

51 As explained in section 1.

The strong repercussions of EU leadership at the subnational level can be explained by three factors. First, although climate-related standards are usually binding, they are normally contained in EU directives, legislative instruments that leave plenty of room for maneuver with regard to implementation at both the national and subnational levels. Second, EU leadership is enhanced by the role of the Commission, which oversees implementation processes in Member States and provides these with assistance that can be targeted to specific subnational needs. The Commission also supports increased leadership in climate action by subnational and local governments through several initiatives, such as the Covenant of Mayors and the related Covenant of Territorial Coordinators, made up of regional or provincial governments supporting the municipalities that are members of the Covenant of Mayors. Third, EU leadership is also ensured because EU cohesion programs provide dedicated funding for climate protection initiatives at the subnational and local level.

Concerning political leadership, while the level of impetus coming from the adoption of climate-related strategies is very similar across all cases, the Austrian *Länder*, and especially Vorarlberg, have prioritized climate protection in much more explicit terms. Both Tyrol and Vorarlberg, the latter as early as 2008, have enshrined climate protection in their subnational constitutions.⁵² Vorarlberg, however, has taken more operational initiatives to translate leadership into political action, which are far from present in the other cases. In 2019, the State Parliament (*Landtag*) of Vorarlberg declared a climate emergency.⁵³ Following this declaration, Vorarlberg announced that it would carry out a preventive check on all of its new legislation in light of climate-related requirements with a view to mitigation and adaptation. Furthermore, Vorarlberg is preparing a general law amending all existing legal provisions to adapt these to the challenge of climate protection. Notwithstanding these operational measures, the issue of whether they will translate into more effective climate measures and more effective CPI is far from clear, and has not been the object of specific analysis in this book. A limited consideration of emissions trends shows that there was no reduction of GHG emissions to date compared to 1990 levels in the case studies.

If we look at party politics, no strong leadership can be detected at the subnational level. The governing political parties in Bolzano and Trento placed

52 See Chapters 2 and 7 in this volume.

53 For an overview of all governments that made such a declaration, see <https://climateemergencydeclaration.org/climate-emergency-declarations-cover-15-million-citizens/#nationalgovernments>.

no particular emphasis on climate issues in their electoral programs; the only reference was to a vague concept of sustainability. A more explicit focus on climate issues is instead present in the programs of all parties in Tyrol and Vorarlberg.⁵⁴

Regarding leadership in administration, interviews were not conclusive. It could be said that there is some leadership in policy-making as testified by the long-term vision provided for in the cross-sectoral and sectoral strategic documents adopted in all case studies. However, there is no binding requirement at the subnational level to integrate climate change into sectoral policies. This occurs mostly as a result of contingent strategies that may change in the future, and therefore on a voluntary basis. Given the dependence of informal mechanisms of cooperation on the personal relationships between policy officers and policy departments, it can be assumed that the impetus towards sectoral CPI depends partially on the initiative of individual administrative officers. However, more precise timelines to verify the effectiveness of commitments are lacking. More generally, less sense of direction can be derived from climate-related subnational strategies when it comes to monitoring implementation and enforcing rules.

2.4.2 Evaluation

Leadership is less discussed and less acknowledged as a factor for CPI at the subnational level, but its propulsive function cannot be underestimated, at least when it comes to determining strategic priorities. Whether there is room for a subnational leadership independent from the national and European levels is difficult to ascertain in the areas we studied. We have pointed out above that in very limited cases the subnational level has promoted innovation and anticipated European targets. This is also true for the municipal level: municipalities adhering to the Covenant of Mayors show a high level of local leadership that is anchored to EU goals but this initiative promotes actions that are additional to what is required by EU law (which, for instance, does not provide explicit climate obligations for municipalities). Furthermore, among the case studies analyzed, Vorarlberg clearly stands out in terms of leadership in that it has created operational mechanisms to realize CPI.

There is also some evidence from the interviews to suggest that leadership may be influenced by participation or, more broadly, the engagement of civil

54 See Chapter 7 in this volume.

society and citizens. Chapter 9, for instance, referred to the influence of Fridays for Future movements on the political agenda concerning climate change.⁵⁵

Finally, leadership appears to be related to horizontal coordination: the level of commitment of policy officers in different sectors is likely to influence the informal mechanisms of coordination, which in most cases are influenced by personal relationships. Conversely, leadership at subnational level needs to be supported by strong horizontal coordination at subnational level, because our cases indicate that visions for CPI need to be sustained by structures.

2.5 *Funding*

Funding is intended in Chapter 8 as the spending capacity of the subnational governments analyzed. There is little doubt that funding can facilitate CPI, since it seems to be instrumental for all the dimensions described in the previous sections. Funding is important for coordination because it allows institutions to operate. Funding is essential in enabling participation, also by means of more targeted information campaigns that need to be financed with public money. It is also essential to operationalize leadership, since visions without funds are not achievable. The extent to which the study areas have climate-dedicated funding is difficult to answer for the reasons that are explained in the following.

2.5.1 Critical Overview of Subnational Budgets

Climate-related spending policies are highly fragmented for two main reasons. First, dedicated climate-budgets do not exist in the case studies, with the exception of the Province of Trento (Climate Fund – *Fondo Clima* since 2010). This lack of dedicated climate budgets likely reflects the lack of organizational units (administrative departments) dedicated solely to climate change in the study areas. Second, climate protection can be the indirect result of activities that have a different primary interest at their core. For this reason, relevant budgets are not only those explicitly classified as related to environmental protection and sustainable development, but also all sectoral budgets financing sectoral policies that pursue climate-related objectives. Sectoral budgets, however, do not explicitly earmark climate-related resources and this exacerbates the difficulty in interpreting budgetary data for the purpose of CPI. Specific

55 Chapter 7, however, acknowledged that the influence of civic movements on institutional climate agendas might be considered more as the expression of those movements' leadership rather than leadership of both the administration and political actors.

climate-related budgets in the Austrian cases may also derive from the programs developed by the *Bund* or the *Länder* under the private administration clause (*Privatwirtschaftsverwaltung* – articles 17 and 116 B-VG).

Fragmentation also prevents the comparability of data. Comparing data across study areas is also problematic for demographic reasons in Austria, since differences in the number of inhabitants between Tyrol and Vorarlberg are substantial (more than 750,000 in Tyrol and less than 400,000 in Vorarlberg). In Italy, due to the reform of 2016 that changed accounting rules, data preceding the reform are not comparable with post-2016 budgets. Finally, comparability is negatively affected by the fact that it is difficult to distinguish between funds dedicated to the running costs of the administrative units that implement climate-related policies and portions of the budget that are specifically dedicated to either implementing climate-related policies or steering private activities.

Notwithstanding these limitations, some trends emerge. In the Province of Trento, the funds allocated to *Fondo Clima* have decreased over time. Yet in climate-related sectors, a continuous increase in budgets across all of the areas studied was seen. In Austria, no available data were available for the sectoral budgets of spatial planning and water management. A slight decrease in the funds allocated to the energy sector for 2020 was instead observed compared to previous years. This sector again includes, across all case studies, a high share of monetary incentives and subsidies to promote the transition to RES and energy efficiency. Although data on the oscillation of climate-related budgets across the years are difficult to interpret, the authors of Chapter 9 conclude that, based on the long-term climate objectives of the selected subnational governments, funding in these matters will be increased in the future. This is also likely in light of the fact that EU funds complement dedicated national and subnational budgets in a way that will likely increase public expenditure in climate-related matters.

2.5.2 Evaluation

The lack of a clear understanding of the resources available to finance public expenditure in climate-related matters is certainly a problem for a discussion evaluating the importance of this factor for CPI, *inter alia* because administrations cannot count on a clear overview to plan future actions. A dedicated climate budget would improve this aspect, and would also ameliorate implementation as a means “allowing the political statements to be translated into concrete initiatives and ... enabling the impact of these actions – including the

economic impact – to be assessed in the appropriate fora”.⁵⁶ Closer scrutiny of public expenditure would in turn highlight any possible waste of resources, and could create incentives for virtuous competition in that subnational governments would be required to justify why they spend less than others on climate issues.

Another important consideration is that, although the availability of funding is a precondition for all dimensions, funding alone cannot trigger the necessary mechanisms of coordination, participation, information, and leadership.

3 Concluding Remarks and Additional Research Avenues

This study demonstrates a strong correlation between the five dimensions of coordination, participation, information, leadership, and funding with CPI. In particular, dedicated coordination mechanisms, leadership at subnational level, dedicated funding, a sufficient degree of information, and more participation in both policy-making and implementation mechanisms with increased clarity on how suggestions are incorporated into final documents are deemed to play a particularly significant role in CPI.

Although all of these factors are necessary to achieve CPI, they are not in themselves sufficient to trigger increased CPI. This is due to two main reasons. First, the quality of CPI ultimately depends on the quality of the processes put in place to create coordination, participation, and information. Second, all factors seem to be intertwined with one another and mutually constitutive.

Concerning the quality of process, the existence of a functioning structure (for instance, climate coordination units within the administration, mandatory participation processes with information campaigns targeted to different groups) is essential for creating the environment, or so to say the culture that is more conducive to CPI. Participation is in this sense perhaps the most nuanced factor: it is important (although not always sufficient) for legitimacy, but there are clear wishes for it to be more substantive that are also linked to critical comments about scope and inclusivity, the role of organized actors, and more.

Structure is certainly a strong determinant also when it comes to leadership and funding. For the former, procedures to prioritize climate change in policy-making appear to be necessary to operationalize leadership. Furthermore, stable coordination units guarantee CPI over time (*infra*). Concerning the latter,

56 See Chapter 8 in this volume.

dedicated budget lines would ensure more planning capacity and enable more public control.

While coordination seems to be equally important for both policy-making and implementation, the relevance of the factors described may change depending on the stages of the policy process. Participation is more established in policy-making but our study demonstrates that it should play a stronger role in policy implementation. This would allow the concerned public both to understand the extent to which their proposals in decision-making have been translated into applicable standards and to make sure that these standards are followed up. In both respects, proactive information campaigns become crucial, because it is extremely difficult to judge implementation solely on the basis of information available on institutional websites. Leadership, instead, seems to be more relevant to policy-making, for instance in the case of Vorarlberg, which operationalized its declaration of a climate emergency with the institutionalization of a preventive climate check of proposed laws/acts. Funding is certainly more critical when it comes to policy implementation.

Regarding the connections existing among factors, these are multiple. The dimensions described are so interlinked with one another that they create an almost inextricable web in the contexts analyzed. Some examples of bilateral links are useful to illustrate this point.

- 1) Vertical coordination and leadership: the existence of coordination among levels may promote the diffusion of policy innovations adopted at subnational level, thereby enhancing subnational leadership with respect to the other governance levels. This has occurred in a very limited way in the case studies.
- 2) Horizontal coordination and leadership: more structure for horizontal coordination (either dedicated agencies in Italy or more resources and more clarity on their mandate in general) may lead to enhanced leadership, intended as the capacity of coordinating units to effectively influence policy-making in climate-related sectors. Furthermore, more leadership, intended as the level of commitment of single officers, may lead to more established practices of informal coordination. In this sense, a critical point is that horizontal coordination and leadership in the case studies are too dependent on individuals, and cannot be guaranteed over time in the absence of dedicated mechanisms.
- 3) Horizontal coordination and participation: coordination is necessary for participation, in that participation in the case studies was most commonly envisaged for the elaboration of broad strategies that require cross-sectoral coordination.

- 4) Information and participation: the former should precede the latter since full, prior, and undisclosed information is a prerequisite for any successful public participation process. A critical point in this respect is represented in the case studies by the presence of information asymmetries between the administration and subjects who would like to take part in public decision-making, thus hindering participation.
- 5) Leadership and information/participation: a good level of public information leading to a good level of participation has repercussions on leadership, since well-informed citizens are able to act as the watchdog of public decision-makers using the information at their disposal as a parameter to check on the adoption of climate policies, demand more climate action, and, ultimately, steer leadership. In this sense, imbalances in participation, that is the fact that some actors (mostly organized ones) are more able (or even the only ones authorized) to intervene in public decision-making, may have different effects on the capacity of public authorities to take the leadership in climate protection. Even subjects excluded from the institutional channels of participation, however, such as usually youth in the case studies, may have a way to influence policy-making and leadership through social movements, such as Fridays for Future. Whether political and administrative leaders reacting to CSOs and civic movements' requests is an expression of their leadership is deemed contentious by some commentators, since civic movements are expressions of their own leadership.⁵⁷ Indeed, uncovering the influence that civic movements' leadership has on CPI was not part of this research, since civic movements are never the only players seeking to shape climate policy or any policy.⁵⁸ That is why this book focuses instead on how the political and administrative leadership of institutional figures influences policy-making in climate matters and CPI.
- 6) Participation and coordination: the level of integration of expert opinions in public decision-making that is achieved through consultation enhances the capacity of sectoral policy officers to understand the importance of CPI, and therefore of more established cross-sectoral coordination.

57 We thank one of the anonymous peer-reviewers for drawing our attention to this point.

58 This also leads to the need for particular methodological approaches to deal with the complexity of influence. See e.g. L. Bosi, M. Giugni and K. Uba (eds.), *The Consequences of Social Movements*. Cambridge (Cambridge University Press 2016). See also Introduction in this volume.

- 7) Funding and all dimensions: funding is linked to coordination because structure needs dedicated funding; it is connected to participation, because this needs large-scale information campaigns and the overcoming of participation barriers that require public investment; it is related to leadership, both because visions need means to be implemented and because more transparent climate-budgets would allow for more public scrutiny.

The web of dimensions leads us to discuss some important cross-context findings. It emerges from all case studies that a long-term culture of participation does not mean anything on its own but needs to be backed up by structures (coordination and information above), which alone can ensure the quality of the participatory processes and therefore the relevance of participation for CPI. Another cross-context finding concerns the overarching importance of transparency, and therefore of information, for public budgets to be more predictable for policy-makers and accessible to the public, and as said for ensuring the quality of participatory processes. Finally, the importance of EU leadership, groupings, and funding opportunities for CPI is extremely clear regardless of context.

Are these findings applicable in other contexts? First, the conclusions discussed are relevant within the context of the case studies mainly for mitigation policies, but can give some guidance to policy-makers when developing or implementing urgently needed adaptation policies. Second, although the peculiarity of this research lies in the fine-grained level of the analysis, so that even the study of different Italian regions and Austrian *Länder* may give different results on specific dimensions, the same research questions and factors could be used to approach the issue of CPI in different study areas and systems of decentralized policy-making. The reflections on processes and structure made above are therefore suited to being extended to different contexts. An interesting issue to discuss in different contexts could be the relative importance of factors/dimensions, which in the cases analyzed in this book did not emerge as particularly crucial. In order to this point, however, a discussion on the effectiveness of CPI and how to evaluate it would be necessary.

It is undisputable that CPI needs to be studied further at the subnational level, since the intricacies of effectively achieving climate protection are embedded within these systems. This public endeavor is more urgent than ever and requires institutional and non-institutional actors at all levels to act in a collaborative way.

Appendix

Interview Guide

The following is the general interview guide used for the project 'Climate change integration in multilevel governance in Italy and Austria: decision-making processes and implementation in selected policy sectors at the subnational level' (Research Südtirol 2019).

In addition to some general questions and questions on the single policy sectors, the interview guide focuses on the factors discussed in the introduction and other chapters of this volume. These are: 1) the level and mode of coordination (horizontal / vertical) between different responsible authorities; 2) leadership (both political and administrative); 3) public participation; 4) information available to the public and the ways in which this is communicated; 5) dedicated finances.

Given the variety of profiles and roles of interviewees, the guide was partially modified or adapted during each interview based on the characteristics of the specific respondent. The priority was to concentrate on those factors which we considered single respondents could provide us with the most information about.

Interview Questions

Policy Sector

Please briefly summarize the main initiatives aiming at integrating the fight against climate change in your policy sector since 2005.

On the basis of this summary, what were the main obstacles to integrating the fight against climate change in your policy sector in legal terms? Were they overcome? How?

Coordination (Horizontal)

Considering the different departments in the Province/*Land*, would you say that there is a shared strategy and common aims on the fight against climate change?

Could you tell me who defines the roles and responsibilities related to the fight against climate change, and can you briefly describe how the main coordination mechanisms between different departments work, both formal and informal?

Coordination (Vertical)

What is, and what was, the role of legislation and national and international policies in determining the integration of the fight against climate change at the sectoral level?

Please briefly describe how the main formal and informal coordination mechanisms between different levels of government work.

Leadership

Who sets the priorities on the fight against climate change at the Province/*Land* level?

Has there been any change over the years regarding the priority assigned to the fight against climate change, and to the visions that guide climate policy integration in different policy sectors?

Participation

How is (and was) the population involved in decisions regarding the fight against climate change? For example, were civil society organizations or the manufacturing sector involved?

Does a tool for the effective measurement and evaluation of public participation exist?

Information

What procedures are foreseen to allow the population to request information on policies concerning the fight against climate change? How does the administration respond to these requests?

Is there a shared strategy and common goals about communication on the fight against climate change?

Please give a brief account of the main campaigns, events and education/training initiatives organised over the years to talk about climate change.

Funding

How has the availability of economic resources dedicated to the fight against climate change evolved over the years, both in quantitative terms and with respect to the priorities identified and the types of projects financed?

Where do the main financial resources for the fight against climate change come from?

References

- Abbott, K.W., “Strategic Ordering in Polycentric Governance”, in A. Jordan, D. Huitema, H. Van Asselt and J. Forster (eds.), *Governing Climate Change: Polycentricity in Action?* (Cambridge University Press 2018) 188–209.
- Adelle, C. and Russel, D., “Climate Policy Integration: A Case of Déjà Vu?”, *Environmental Policy and Governance*, 23 (2013) 1–12.
- Adger, W.N., et al., “Adapting to Climate Change: Perspectives Across Scales”, *Global Environmental Change*, 15 (2005) 75–76.
- Adriázola, P., et al., *Multi-level Climate Governance Supporting Local Action* (GIZ 2018).
- Akyürek, M., “Wasserrecht”, in N. Raschauer and W. Wessely (eds.), *Handbuch Umweltrecht* (facultas 2010) 236–269.
- Alberton, M., *Governi ambientali negli ordinamenti composti. Traiettorie italiane e spagnole tra unità e asimmetria* (ESI 2021).
- Alberton, M., “Water Governance in Italy: From Fragmentation to Coherence through Coordination Attempts”, in P. Turrini et al. (eds.), *Water Law, Policy and Economics in Italy: Between National Autonomy and EU Law Constraints* (Springer 2021) 355–368.
- Alberton, M. and Cittadino, F., *La tutela dell’ambiente tra Stato e Regioni alla luce della riforma costituzionale* (ESI 2015).
- Alberton, M. and Cittadino, F., “La tutela dell’ambiente”, in W. Obwexer et al. (eds.), *L’impatto dell’Unione europea sull’autonomia legislativa ed amministrativa dell’Alto Adige/Südtirol* (ESI 2015) 471–514.
- Alberton, M. and Cittadino, F., “Umweltschutz”, in W. Obwexer et al. (eds.), *EU-Mitgliedschaft und Südtirols Autonomie. Die Auswirkungen der EU-Mitgliedschaft auf die Autonomie des Landes Südtirol am Beispiel ausgewählter Gesetzgebungs- und Verwaltungskompetenzen Handbuch* (Verlag Österreich 2015) 438–478.
- Alberton, M., Cittadino, F., and Mitrotta, E., “La tutela dell’ambiente: la prevenzione delle alluvioni e la qualità dell’aria”, in W. Obwexer et al. (eds.), *EU-Mitgliedschaft und Südtirols Autonomie II: die Auswirkungen der EU-Mitgliedschaft auf die Autonomie des Landes Südtirol am Beispiel ausgewählter Gesetzgebungs- und Verwaltungskompetenzen – eine Fortsetzung; Handbuch* (Verlag Österreich 2019) 333–379.
- Altheide, D., et al., “Emergent Qualitative Document Analysis”, in S. Nagy Hesse-Biber and P. Leavy (eds.), *Handbook of Emergent Methods* (Guilford 2008) 127–151.
- Amundsen, H., Berglund, F. and Westskog, H., “Overcoming Barriers to Climate Change Adaptation—A Question of Multilevel Governance?”, *Environment and Planning C: Government and Policy*, 28 (2010) 276–289.
- Anderson, G., *Fiscal Federalism: A Comparative Introduction* (Oxford 2010).

- Andonova, L.B., *et al.*, “National Policy and Transnational Governance of Climate Change: Substitutes or Complements?”, *International Studies Quarterly*, 61 (2017) 253–268.
- Antonini, L., *Il regionalismo differenziato* (Giuffrè 2000).
- Arban, E., “Exploring the Principle of (Federal) Solidarity”, *Review of Constitutional Studies/Revue d'études constitutionnelles*, 22(2) (2017) 241–260.
- Arban, E., Martinico, G., and Palermo, F., (eds.), *Federalism and Constitutional Law: The Italian Contribution to Comparative Regionalism* (Routledge 2021).
- Asenbaum, H., “Facilitating Inclusion: Austrian Wisdom Councils as Democratic Innovation between Consensus and Diversity”, *Journal of Public Deliberation*, 12(2) 2016.
- Avolio, G. and Palermo, F., (eds.), *La riforma del titolo V, parte seconda, della Costituzione italiana: analisi ed effetti per la Provincia autonoma di Bolzano* (Eurac Research 2004).
- Aykut, S.C., “Taking a Wider View on Climate Governance: Moving Beyond the ‘Iceberg’, the ‘Elephant’, and the ‘Forest’”, *Climate Change*, 7 (2016) 318–328.
- Aykut, S.C., Morena, E. and Foyer, J., “‘Incantatory’ Governance: Global Climate Politics’ Performative Turn and its Wider Significance for Global Politics”, *International Politics*, 58 (2021) 519–540.
- Bach, T. and Wegrich, K., (eds.), *The Blind Spots of Public Bureaucracy and the Politics of Non-Coordination* (Palgrave Macmillan 2019).
- Baker, S., *et al.* (eds.), *The Politics of Sustainable Development: Theory, Policy and Practice Within the European Union* (Routledge 1997).
- Baseggio, C., “Competenze statali, regionali e locali in tema di aree naturali protette nella giurisprudenza della Corte costituzionale e nella recente legislazione regionale”, *Istituzioni del federalismo*, 5 (2007) 513–546.
- Bates, R., “Contra Contractarianism: Some Reflections on the New Institutionalism”, *Politics & Society*, 16 (1988) 387–401.
- Bauer, M.W., *et al.*, (eds.), *Dismantling Public Policy: Preferences, Strategies, and Effects* (Oxford University Press 2012).
- Bäckstrand, K. and Löfbrand, E., “The Road to Paris: Contending Climate Governance Discourse in the Post-Copenhagen Era”, *Journal of Environmental Policy and Planning*, 21 (2019) 519–532.
- Bellocci, M. and Passaglia, P., *La giurisprudenza costituzionale relativa al riparto di competenze tra Stato e Regioni in materia di «ambiente» e di «beni culturali»* (Corte costituzionale 2009).
- Bellomo, G., “Il modello giuridico delle aree naturali protette in Italia tra valorizzazione e protezione sostenibile”, *Revista de Direitos Difusos*, 72 (2019) 10–42.
- Benelli, F., “L’ambiente tra “smaterializzazione” della materia e sussidiarietà legislativa”, *Le Regioni*, 1 (2004) 176–184.

- Bernstein, S. and Hoffmann, M., “The Politics of Decarbonization and the Catalytic Impact of Subnational Climate Experiments”, *Policy Sciences*, 51 (2018) 189–211.
- Bertel, M., “Staatszielbestimmungen”, in J. Breitenlechner *et al.* (eds.), *Sicherung von Stabilität und Nachhaltigkeit durch Recht* (Jan Sramek 2014) 139–159.
- Berti, G. and De Martin, C., (eds.), *Le autonomie territoriali: dalla riforma amministrativa alla riforma costituzionale. Atti del convegno di Roma, 9 gennaio 2001* (Giuffrè 2001).
- Bertuzzi, N., *et al.* (eds.), *Interview Report Bolzano, Trento, Vorarlberg and Tyrol* (2021).
- Bettinelli, E. and Rigano, F., (eds.), *La riforma del Titolo V della Costituzione e la giurisprudenza costituzionale. Atti del Seminario (Pavia, 6–7 giugno 2003)* (Giappichelli 2004).
- Biermann, F. and Pattberg, P. H., (eds.), *Global Environmental Governance Reconsidered* (MIT Press 2012).
- Biermann, F., Kanieb, N. and Kima, R.E., “Global Governance by Goal-setting: The Novel Approach of the UN Sustainable Development Goals”, *Current Opinion in Environmental Sustainability*, 26–27 (2017) 26–31.
- Biesbroek, G.R., *et al.*, “Europe Adapts to Climate Change: Comparing National Adaptation Strategies”, *Global Environmental Change*, 20 (2010) 440–450.
- Bin, R. and Falcon, G., (eds.), *Diritto regionale* (Il Mulino 2019).
- Bohman, J. and Rehg, W., (eds.), *Deliberative Democracy. Essays on Reason and Politics* (MIT Press 1997).
- Bornemann, B. and Weiland, S., “The UN 2030 Agenda and the Quest for Policy Integration: A Literature Review”, *Politics and Governance*, 9 (2021) 96–107.
- Boschini, L., *et al.*, *Rapporto Ambientale – Piano Energetico Provinciale 2020* (Provincia Autonoma di Trento 2020).
- Boscolo, E., “La pianificazione generale”, in M.A. Cabiddu (ed.), *Diritto del governo del territorio* (Giappichelli 2020) 97–128.
- Bosi, L., Giugni, M. and Uba, K., (eds.), *The Consequences of Social Movements* (Cambridge University Press 2016).
- Bowen, K.J., *et al.*, “Implementing the ‘Sustainable Development Goals’: Towards Addressing Three Key Governance Challenges—Collective Action, Trade-Offs, and Accountability”, *Current Opinion in Environmental Sustainability*, 26–27 (2017) 90–96.
- Böcher, M. and Nordbeck, R., “Klima-Governance: Die Integration und Koordination von Akteuren, Ebenen und Sektoren als klimapolitische Herausforderung Einführung in den Schwerpunkt der moderne staat”, *Zeitschrift für Public Policy, Recht und Management*, 7 (2014) 253–268.
- Brouwer, S., Rayner, T. and Huitema, D., “Mainstreaming Climate Policy: The Case of Climate Adaptation and the Implementation of EU Water Policy”, *Environment and Planning C: Government and Policy*, 31 (2013) 134–153.

- Brown, D., "Cooperative Versus Competitive Federalism: Outcomes and Consequences of Intergovernmental Relations on Climate Change Issues in Canada", *Zeitschrift für Kanada – Studien*, 32 (2012) 9–27.
- Brunazzo, M., "Istituzionalizzare la partecipazione? Le leggi sulla partecipazione in Italia", *Le Istituzioni del Federalismo*, 3 (2017) 837–864.
- Brutti, N., *Il diritto all'informazione ambientale. Profili comparatistici* (Giappichelli 2005).
- Bryson, J., Crosby, B.C. and Bloomberg, L., "Public Value Governance: Moving Beyond Traditional Public Administration and the New Public Management", *Public Administration Review*, 74 (2014) 445–456.
- Bulkeley, H., et al. (eds.), *Transnational Climate Change Governance* (Cambridge University Press 2014).
- Burstein, P., "Policy Domains: Organization, Culture, and Policy Outcomes", *Annual Review of Sociology*, 17 (1991) 327–350.
- Burton, P., and Mustelin, J., "Planning for Climate Change: Is Greater Public Participation the Key to Success?", *Urban Policy and Research*, 31 (2013) 399–415.
- Bußjäger, P., "Austria's Cooperative Federalism", in G. Bischof and F. Karlhofer (eds.), *Austrian Federalism in Comparative Perspective* (The University of New Orleans Press 2015) 11–33.
- Bußjäger, P., "Demokratische Innovation und Verfassungsreform", in P. Bußjäger and A. Gamper (eds.), *Demokratische Innovation und Partizipation in der Europaregion* (New Academic Press 2015) 1–21.
- Bußjäger, P., "Multi-Level-Governance als Gegenstand und Herausforderung des Öffentlichen Rechts", *ZÖR*, 71 (2016) 307–330.
- Bußjäger, P., "Der Status quo: Amtsverschwiegenheit und Informationsrecht", in M. Bertel, E. Happacher and A. Simonati (eds.), *Die transparente Verwaltung in Österreich und Italien. Der Zugang zur Information zwischen Grundsätzen und Anwendung* (New Academic Press 2019) 43–55.
- Bußjäger, P., "Die territoriale Dimension der österreichischen Demokratie in vergleichender Perspektive", in L. Helms and D.M. Wineroither (eds.) *Die österreichische Demokratie im Vergleich* (Nomos 2017) 223–250.
- Bußjäger, P. and Egger, J.A., "Verfassungs- und verwaltungsrechtliche Grundlagen staatlicher Krisenkommunikation", *Österreichische Juristen-Zeitung*, 8 (2021) 63–71.
- Byskov, M.F., et al., "An Agenda for Ethics and Justice in Adaptation to Climate Change", *Climate and Development*, 13 (2021) 1–9.
- Candel, J.J. and Biesbroek, R., "Toward a Processual Understanding of Policy Integration", *Policy Sciences*, 49 (2016) 211–231.
- Capano, G. and Howlett, M., "Causal Logics and Mechanisms in Policy Design: How and Why Adopting a Mechanistic Perspective Can Improve Policy Design", *Public Policy and Administration*, 36 (2021) 141–162.

- Cappelletti, S., *et al.*, *Piano Generale di Utilizzazione delle Acque Pubbliche – Relazione Illustrativa* (Provincia Autonoma di Trento 2006).
- Caravita, B., *La Costituzione dopo la riforma del Titolo V: Stato, Regioni e autonomie fra Repubblica e Unione Europea* (Giappichelli 2003).
- Carinci, F., “Il principio di sussidiarietà verticale nel sistema delle fonti”, *forumcostituzionale.it*, (2006).
- Carli, M., *Diritto regionale: le autonomie regionali, speciali e ordinarie* (Giappichelli 2020).
- Carpita, F., *Aree protette e tutela della biodiversità. I parchi italiani nella cornice europea* (Edizioni ETS 2016).
- Carter, N., “Greening the Mainstream: Party Politics and the Environment”, *Environmental Politics*, 22 (2013) 73–94.
- Casado-Asensio, J. and Steurer, R., “Integrated Strategies on Sustainable Development, Climate Change Mitigation and Adaptation in Western Europe: Communication Rather Than Coordination”, *Journal of Public Policy*, 34 (2014) 437–473.
- Cassese, S., *et al.*, *P.A.: trasparenza amministrativa e accesso agli atti* (Ipsos 2018).
- Cattivelli, V., “Climate Adaptation Strategies and Associated Governance Structures in Mountain Areas. The Case of the Alpine Regions”, *Sustainability*, 13(5) (2021) 1–24.
- Ceccherini, E., “Intergovernmental Relationships in Italy a Feeble but Useful Model”, in E. Arban, G. Martinico and F. Palermo (eds.), *Federalism and Constitutional Law: The Italian Contribution to Comparative Regionalism* (Routledge 2021) 65–81.
- Cerulli Irelli, V., “Pianificazione urbanistica e interessi differenziati”, *Rivista trimestrale di diritto pubblico*, 2 (1985) 386–443.
- Chaffin, B.C., *et al.*, “Transformative Environmental Governance”, *Annual Review of Environment and Resources*, 41 (2016) 399–423.
- Chan, S., *et al.*, “Promises and Risks of Nonstate Action in Climate and Sustainability Governance”, *Climate Change*, 10 (2019) 1–8.
- Chieppa, R., “Le esperienze delle commissioni paritetiche e il valore delle norme di attuazione degli statuti speciali regionali”, *Le Regioni*, 6 (2008) 1051–1076.
- Choudry, A. and Kapoor, D., *NGOization: Complicity, Contradictions and Prospects* (Zed Books 2013).
- Christensen, T. and Lægreid, P., “Governmental Autonomisation and Control: The Norwegian Way”, *Public Administration and Development: The International Journal of Management Research and Practice*, 24 (2004) 129–135.
- Christensen, T. and Lægreid, P., “Regulatory Agencies—The Challenges of Balancing Agency Autonomy and Political Control”, *Governance*, 20 (2007) 499–520.
- Claroni, A., “Il mobility manager quale figura di impulso nella ricerca di una mobilità pienamente sostenibile”, *Il Diritto Marittimo*, III (2021) 463–483.
- Coccolito, R., “La competenza legislativa della Provincia di Trento in materia di energia alla prova degli standards minimi di tutela ambientale”, *Osservatorio AIC*, 2 (2014) 1–3.

- Courchene, T., “Reflections on the Federal Spending Power: Practices, Principles, Perspectives”, *Queen’s Law Journal*, 34 (2008) 75–124.
- Cox, M., Arnold, G. and Villamayor Tomás, S., “A Review of Design Principles for Community-Based Natural Resource Management”, *Ecology and Society*, 15(4) (2010) 38–57.
- Cudia, C., “Trasparenza amministrativa e pretesa del cittadino all’informazione”, *Diritto Pubblico*, 1 (2007) 99–154.
- Damro, C., Hardie, I. and MacKenzie, D., “The EU and Climate Change Policy: Law, Politics and Prominence at Different Levels”, *Journal of Contemporary European Research*, 4 (2008) 179–192.
- de la Esperanza Mata Pérez, M., Scholten, D.J. and Smith Stegen, K., “The Multi-Speed Energy Transition in Europe: Opportunities and Challenges for EU Energy Security”, *Energy Strategy Reviews*, 26 (2019) 1–6.
- della Porta, D. and Caiani, M., “Europeanization from Below? Social Movements and Europe”, *Mobilization: An International Quarterly*, 12 (2007) 1–20.
- della Porta, D., *et al.*, *Resisting the Backlash* (Routledge 2022).
- Delwiche, A. and Jacobs, H.J., *The Participatory Cultures Handbook* (Routledge 2012).
- de Moor, J., “Postapocalyptic Narratives in Climate Activism: Their Place and Impact in Five European Cities”, *Environmental Politics*, (2021) 1–22.
- de Moor, J., *et al.*, “New Kids on the Block: Taking Stock of the Recent Cycle of Climate Activism”, *Social Movement Studies*, 20 (2021) 619–625.
- Descheneau, P. and Paterson, M., “Between Desire and Routine: Assembling Environment and Finance in Carbon Markets”, *Antipode*, 43 (2011) 662–681.
- Dewulf, A., Meijerink, S. and Runhaar, H., “The Governance of Adaptation to Climate Change as a Multi-level, Multi-sector and Multi-actor Challenge: A European Comparative Perspective”, *Journal of Water and Climate Change*, 6 (2015) 1–8.
- Di Gregorio, M., *et al.*, “Multi-level Governance and Power in Climate Change Policy Networks”, *Global Environmental Change*, 54 (2019) 64–77.
- Dorsch, M.J. and Flachsland, C., “A Polycentric Approach to Global Climate Governance”, *Global Environmental Politics*, 17 (2017) 45–64.
- Dupont, C. and Jordan, A., “Policy Integration”, in A. Jordan and V. Gravey (eds.), *Environmental Policy in the EU* (Routledge 2021) 203–219.
- Dupont, C. and Oberthür, S., “Insufficient Climate Policy Integration in EU Energy Policy: The Importance of the Long-Term Perspective”, *Journal of Contemporary European Research*, 8 (2012) 228–247.
- Duwe, M., *Making EU Climate Governance Fit for Net Zero: An Analysis of the Current Landscape of Relevant EU Climate Policy Processes and Recommendations for Alignment with the Climate Neutrality Objective* (Federal Environment Agency 2022).
- Duwe, M. and Evans, N., *Climate Laws in Europe: Good Practices in Net-Zero Management* (Ecologic Institute 2015).

- Egger, J., *Untätigkeit im Öffentlichen Recht* (Verlag Österreich 2020).
- Eisendle, A., “Verkehr”, in W. Obwexer *et al.* (eds.), *EU-Mitgliedschaft und Südtirols Autonomie II* (Verlag Österreich 2019) 356–380.
- Eißel, D. and Peng Chu, C., “The Future of Sustainable Transport System for Europe”, *AI & Society*, 29 (2014) 387–402.
- Elstub, S. and Escobar, O., “Defining and Typologizing Democratic Innovations”, in S. Elstub and O. Escobar (eds.), *Handbook of Democratic Innovation and Governance* (Edward Elgar Publishing 2019) 11–31.
- Engel, K.H. and Orbach, B.Y., “Micro-Motives and State and Local Climate Change Initiatives”, *Harvard Law and Policy Review*, 2 (2008) 119–137.
- England, M.I., *et al.*, “Climate Change Adaptation and Cross-Sectoral Policy Coherence in Southern Africa”, *Regional Environmental Change*, 18 (2018) 2059–2071.
- Evans, N. and Duwe, M., *Climate Governance Systems in Europe: The Role of National Advisory Bodies* (Ecologic Institute and IDDRI 2021).
- Fankhauser, S., Gennaioli, C. and Collins, M., “The Political Economy of Passing Climate Change Legislation: Evidence from a Survey”, *Global Environmental Change*, 35 (2015) 52–61.
- Feik, R., “Art. 20(3) B-VG”, in B. Kneihns and G. Lienbacher (eds.), *Rill-Schäffer-Kommentar Bundesverfassungsrecht* (Verlag Österreich 2007).
- Ferrari, C., *et al.*, *Trentino Sostenibile. Verso la Strategia Provinciale di Sviluppo Sostenibile* (Provincia Autonoma di Trento 2019).
- Few, R., Brown, K. and Tompkins, E.L., “Public Participation and Climate Change Adaptation: Avoiding the Illusion of Inclusion”, *Climate Policy*, 7(1) (2007) 46–59.
- Fitz, J., *et al.*, “Klima, Luft und Mobilität”, *juridikum*, 4 (2019) 510–513.
- Fleig, A., *et al.*, “Legislative Dynamics of Mitigation and Adaptation Framework Policies in the EU”, *European Policy Analysis*, 3 (2017) 101–124.
- Fonderico, F., “Il diritto di accesso all’informazione ambientale”, *Giornale di diritto amministrativo*, 6 (2006) 675–685.
- Font, J., Pasadas del Amo, S. and Smith, G., “Tracing the Impact of Proposals from Participatory Processes: Methodological Challenges and Substantive Lessons”, *Journal of Public Deliberation*, 12(1) (2006) 1–25.
- Forster, A., “Art. 20 B-VG”, in A. Kahl, L. Khakzadeh, S. Schmid (eds.), *Kommentar zum Bundesverfassungsrecht* (Jan Sramek Verlag 2021) 444–465.
- Frediani, E., “Le garanzie partecipative nella valutazione di impatto ambientale: strumenti tradizionali e dibattito pubblico”, *Le istituzioni del Federalismo*, 3 (2020) 657–678.
- Furfari, S., “The Energy Dimension of Cities”, in M. Fernández-Prado and L. Domínguez Castro (eds.), *City Policies and the European Urban Agenda* (Palgrave Macmillan 2019) 195–223.

- Gadani, G., Galarraga, I. and Sainz de Murieta, E., “The Importance of Regional Governments in Climate Change Policies”, *CERCIS Working Paper*, (2020).
- Galarraga, I., Gonzalez-Eguino, M. and Markandya, A., “The Role of Regional Governments in Climate Change Policy”, *Environmental Policy and Governance*, 21 (2011) 164–182.
- Gamper, A., “Kompetenzgerichtsbarkeit und Kompetenzinterpretation in Österreich”, in A. Gamper *et al.* (eds.), *Föderale Kompetenzverteilung in Europa* (Nomos 2016) 575–606.
- Gamper, A., “Artikel 7 Ziele und Grundsätze des staatlichen Handelns”, in P. Bußjäger, A. Gamper and C. Ranacher (eds.), *Tiroler Landesverfassungsrecht* (Verlag Österreich 2020) 110–132.
- Giangaspero, P., “I decreti di attuazione degli Statuti speciali”, in R. Bin and L. Coen (eds.), *I nodi tecnici della revisione degli Statuti speciali* (I.S.G.Re 2008) 107–123.
- Giese, K., “Art 116 B-VG”, in A. Kahl and L. Khakzadeh and S. Schmid (eds.), *Kommentar Bundesverfassungsrecht* (Jan Sramek 2021) 1139–1151.
- Ginanjari, W. and Mubarok, A., “Civil Society and Global Governance: The Indirect Participation of Extinction Rebellion in Global Governance on Climate Change”, *Journal of Contemporary Governance and Public Policy*, 1 (2020) 41–52.
- Gores, S., *et al.*, *Turning Points for the Ambition of European Climate Targets: Getting Granular on the Process and Identifying Cornerstones for Discussion* (Öko Institut and Ecologic Institute 2020).
- Grabenwarter, C. and Holoubek, M., *Zur Auslegung des Art 17 B-VG* (ZfV 2016).
- Grafakos, S., *et al.*, “Integration of Mitigation and Adaptation in Urban Climate Change Action Plans in Europe: A Systematic Assessment”, *Renewable and Sustainable Energy Reviews*, 121 (2020) 1–20.
- Gupta, J. and Ringius, L., “The EU’s Climate Leadership: Reconciling Ambition and Reality”, *International Environmental Agreements: Politics, Law and Economics*, 1 (2001) 281–299.
- Gupta, J., *et al.*, “The Adaptive Capacity Wheel: A Method to Assess the Inherent Characteristics of Institutions to Enable the Adaptive Capacity of Society”, *Environmental Science & Policy*, 13(6) (2010) 459–471.
- Habermas, J., *Faktizität und Geltung. Beiträge zur Diskurstheorie des Rechts und des demokratischen Rechtsstaates* (Suhrkamp 1992).
- Habjan, T., “Das österreichische Klimaschutzgesetz”, in G. Kirchengast, E. Schulev-Steindl and G. Schnedl (eds.), *Klimaschutzrecht zwischen Wunsch und Wirklichkeit* (Böhlau Verlag 2018) 98–110.
- Hale, T., ““All Hands on Deck”: The Paris Agreement and Nonstate Climate Action”, *Global Environmental Politics*, 16 (2016) 12–22.
- Hale, T., “The Role of Sub-State and Non-State Actors in International Climate Processes”, *Chatham House Research Paper*, (2018).

- Hauenschild, H., "Kraftfahrlineiengesetz und Öffentlicher Personennahverkehr", in L. Bauer (ed.), *Handbuch Verkehrsrecht* (facultas 2009) 473–496.
- Härtel, I., "Klimaschutzverfassungsrecht: Klima-Staatszielbestimmungen im Föderalismus", *Natur und Recht*, 42 (2020) 577–588.
- Held, D. and Hervey, A., "Democracy, Climate Change and Global Governance: Democratic Agency and the Policy Menu Ahead", in D. Held, A. Fane-Hervey and M. Theros (eds.), *The Governance of Climate Change* (Cambridge Polity Press 2011) 89–110.
- Hellrigl, M., "Bürgerräte in Vorarlberg", in P. Bußjäger, A. Balthasar and N. Sonntag (eds.), *Direkte Demokratie im Diskurs: Beiträge zur Reform der Demokratie in Österreich* (New Academic Press 2014) 163–168.
- Heyvaert, V., "What's in a Name? The Covenant of Mayors as Transnational Environmental Regulation", *Review of European, Comparative & International Environmental Law*, 22 (2013) 78–90.
- Holoubek, M., "Säumnis des Gesetzgebers", in M. Holoubek and M. Lang (eds.), *Rechtsschutz gegen staatliche Untätigkeit* (Linde Verlag 2011) 247–264.
- Hood, C., "A Public Management for all Seasons?", *Public Administration*, 69 (1991) 3–19.
- Hsu, A., Weinfurter, A.J. and Xu, K., "Aligning Subnational Climate Actions for the New Post-Paris Climate Regime", *Climatic Change*, 142 (2017) 419–432.
- Hueglin, T. and Fenna, A., *Comparative Federalism: A Systematic Inquiry* (University of Toronto Press 2015).
- Hustedt, T. and Danken, T., "Institutional Logics in Inter-Departmental Coordination: Why Actors Agree on a Joint Policy Output", *Public Administration*, 95 (2017) 730–743.
- Jahnel, D., "Baurecht", in S. Bachmann *et al.* (eds.), *Besonderes Verwaltungsrecht* (Verlag Österreich 2022) 565–597.
- Jänicke, M. and Quitzow, R., "Multi-Level Reinforcement in European Climate and Energy Governance: Mobilizing Economic Interests at the Sub-National Levels", *Environmental Policy and Governance*, 27 (2017) 122–136.
- Jochim, A.E. and May, P.J., "Beyond Subsystems: Policy Regimes and Governance", *Policy Studies Journal*, 38 (2010) 303–327.
- Jordan, A., Huitema, D., Van Asselt, H. and Forster, J., (eds.), *Governing Climate Change: Polycentricity in Action?* (Cambridge University Press 2018).
- Jordan, A. and Lenschow, A., "Policy Paper Environmental Policy Integration: A State of the Art Review", *Environmental Policy and Governance*, 20 (2010) 147–158.
- Jordan, A. and Schout, J., *The Coordination of the European Union: Exploring the Capacities of Networked Governance* (Oxford University Press 2006).
- Kahl, A., "Art 17 B-VG", in B. Kneihns and G. Lienbacher (eds.), *Rill-Schäffer-Kommentar Bundesverfassungsrecht* (Verlag Österreich 2013).
- Kahl, A. and Weber, K., *Allgemeines Verwaltungsrecht* (facultas 2019).
- Kaldor, M., *Global Civil Society: An Answer to War* (Polity Press 2003).

- Keating, M., "Europe as a Multilevel Federation", *Journal of European Public Policy*, 24 (2017) 615–632.
- Keck, M.E. and Sikkink, K., *Advocacy Networks in International Politics* (Cornell University Press 1998).
- Keohane, R.O. and Victor, D.G., "The Regime Complex for Climate Change", *Perspectives on Politics*, 9 (2011) 7–23.
- Kettner, C. and Kletzan-Slamanig, D., "Climate Policy Integration on the National and Regional Level: A Case Study for Austria and Styria", *International Journal of Energy Economics and Policy*, 8 (2018) 259–269.
- Klaushofer, R., "Raumordnungsrecht", in E. Pürgy (ed.), *Das Recht der Länder* (Sramek 2012) 827–865.
- Kleewein, W., "Instrumente der Raumordnung – Überblick und Ausblick", *baurechtliche blätter:bbl*, 3 (2014) 89–106.
- Kment, M., "Europäische Raumentwicklung – Kompetenzen der Europäischen Union und Perspektiven", in S. Lorenzmeier and H.P. Folz (eds.), *Recht und Realität. Festschrift für Christoph Vedder* (Nomos 2017) 207–222.
- Knieling, J., (ed.), *Climate Adaptation Governance in Cities and Regions: Theoretical Fundamentals and Practical Evidence* (Wiley Blackwell 2016).
- Kona, A., et al., "Covenant of Mayors Signatories Leading the Way Towards 1.5 Degree Global Warming Pathway", *Sustainable Cities and Society*, 41 (2018) 568–575.
- Koppensteiner, F., "Transparenz im Unionsrecht, ein Überblick", in M. Bertel, E. Happacher and A. Simonati (eds.), *Die transparente Verwaltung in Österreich und Italien. Der Zugang zur Information zwischen Grundsätzen und Anwendung* (New Academic Press 2019) 1–39.
- Koppensteiner, F., "Unionsrechtliches Dokumentenzugangsrecht und staatliche Informationsfreiheit: Zwei Parallelen, die sich niemals treffen?", *Die Öffentliche Verwaltung*, 1 (2022) 21–28.
- Koubek, R., "Systembetrachtung CO₂-Reduktion, Elektrotechnik & Informationstechnik", *Elektrotechnik und Informationstechnik*, 129 (2012) 367–373.
- Krumm, T., *Föderale Staaten im Vergleich. Eine Einführung* (Wiesbaden 2015).
- Kruse, S. and Pütz, M., "Adaptive Capacities of Spatial Planning in the Context of Climate Change in the European Alps", *European Planning Studies*, 22 (2014) 2620–2638.
- Kulovesi, K. and Oberthür, S., "Assessing the EU's 2030 Climate and Energy Policy Framework: Incremental Change toward Radical Transformation?", *Review of European, Comparative & International Environmental Law*, 29 (2020) 151–166.
- Lafferty, W. and Hovden, E., "Environmental Policy Integration: Towards an Analytical Framework", *Environmental Politics*, 12 (2003) 1–22.
- Lambert, M.-L., et al., *Adapter les territoires au changement climatique : Outils juridiques d'urbanisme et d'aménagement* (Territorial éditions 2020).

- Landauer, M., Juhola, S. and Klein, J., “The Role of Scale in Integrating Climate Change Adaptation and Mitigation in Cities”, *Journal of Environmental Planning and Management*, 62 (2018) 741–765.
- La Rocca, R.A., “Soft Mobility and Urban Transformation: Some European Case Studies”, *TeMALab Journal of Mobility, Land Use and Environment*, 2 (2009) 85–90.
- Lehne, F. and Weismann, P., “Auf dem Weg zur Informationsfreiheit?”, *Österreichische Juristen-Zeitung*, 22 (2021) 1022–1029.
- Lélé, S.M., “Sustainable Development: A Critical Review”, *World Development*, 19 (1991) 607–621.
- Lienbacher, G., “Raumordnungsrecht”, in S. Bachmann *et al.* (eds.), *Besonderes Verwaltungsrecht* (Österreich Verlag 2020) 509–544.
- Lorenzoni, I. and Hulme, M., “Believing Is Seeing: Laypeople’s Views of Future Socio-Economic and Climate Change in England and in Italy”, *Public Understanding of Science*, 18 (2009) 383–400.
- Maggi, S., *Mobilità sostenibile. Muoversi nel XXI secolo* (Il Mulino 2020).
- Magnifico, L., “Stato, regione o autorità di regolazione alla guida del trasporto pubblico locale?”, *Osservatorio AIC*, 1 (2013) 1–14.
- Malnaca, K. and Yatskiv, I., “Impact of Critical Variables on Economic Viability of Converted Diesel City Bus into Electric Bus”, in E.G. Nathanail and I.D. Karakikes (eds.), *Data Analytics: Paving the Way to Sustainable Urban Mobility. Proceedings of 4th Conference on Sustainable Urban Mobility (CSUM 2018), 24–25 May, Skiathos Island, Greece* (Springer 2019) 847–855.
- Mancini, M., “La disciplina degli istituti di protezione della fauna selvatica e della biodiversità, nel quadro del riparto delle competenze tra Stato e Regioni”, *Ricerche giuridiche*, 6 (2017) 23–54.
- March, J. and Olsen, J., “The New Institutionalism: Organizational Factors in Political Life”, *American Political Science Review*, 78 (1983) 734–749.
- Marcinkiewicz, K. and Tosun, J., “Contesting Climate Change: Mapping the Political Debate in Poland”, *East European Politics*, 31 (2015) 187–207.
- Martines, T., Morelli, A. and Ruggeri, A., *Lineamenti di diritto regionale* (Giuffrè 2019).
- Massey, E., *et al.*, “Climate Policy Innovation: The Adoption of Adaptation Policies across Europe”, *Global Environmental Change*, 29 (2014) 434–443.
- Massey, E. and Huitema, D., “The Emergence of Climate Change Adaptation as a New Field of Public Policy in Europe”, *Regional Environmental Change*, 16 (2016) 553–564.
- Mayer, B., *The International Law on Climate Change* (Cambridge University Press 2018).
- Meadowcroft, J., *et al.*, (eds.), *What Next for Sustainable Development?: Our Common Future at Thirty* (Edward Elgar 2019).
- Mengozi, M., “Il “Governo del territorio” e la sua intersezione strutturale con la “tutela dell’ambiente”: linee di continuità e di evoluzione”, *federalismi.it*, 15 (2017).

- Meyer-Ohlendorf, N., *A European Climate Law – Analysis of the European Commission Proposal* (Ecologic Institute 2020).
- Mickwitz, P., et al., “Climate Policy Integration, Coherence and Governance”, *Partnership for European Environmental Research*, Report No. 2 (2009).
- Miller, D., “Deliberative Democracy and Social Choice”, *Political Studies*, 40 (1992) 54–67.
- Mintrom, M. and Luetjens, J., “Policy Entrepreneurs and Problem Framing: The Case of Climate Change”, *Environment and Planning C: Politics and Space*, 35 (2017) 1362–1377.
- Mogelgaard, K., et al., “From Planning to Action: Mainstreaming Climate Change Adaptation into Development”, *World Resources Institute Working Paper*, (September 2018).
- Monti, A. and Martinez Romera, B., “Fifty Shades of Binding: Appraising the Enforcement Toolkit for the EU’s 2030 Renewable Energy Targets”, *Review of European, Comparative & International Environmental Law*, 29 (2020) 221–231.
- Munafò, M., (ed.), “Consumo di suolo dinamiche territoriali e servizi ecosistemici”, *Report SNPA 22/21*, (2021).
- Musella, F., *Political Leaders Beyond Party Politics* (Palgrave 2018).
- Müllner, J., “Art 10 Abs 1 Z 10 B-VG”, in A. Kahl and L. Khakzadeh and S. Schmid (eds.), *Kommentar Bundesverfassungsrecht* (Jan Sramek 2021) 212–228.
- Neef, M., Dettmber, T. and Schebek, L., “Comparing Carbon Performances of Mobility Services and Private Vehicles from a Life Cycle Perspective”, in F. Teuteberg, M. Hempel and L. Schebek (eds.), *Progress in Life Cycle Assessment 2018* (Springer 2019) 47–60.
- Neudorfer, S., “Kompetenzdeckungsklauseln außerhalb des B-VG Österreichische Provisorienkultur oder sinnvoller Pragmatismus?”, in S. Schmid et al. (eds.), *Auf dem Weg zum hypermodernen Rechtsstaat?* (Jan Sramek 2011) 111–150.
- Nevola, R., *La tutela dell’ambiente, degli ecosistemi e dei beni culturali nei giudizi in via principale di legittimità costituzionale* (Corte Costituzionale 2015).
- Nevola, R., (ed.), *Giurisprudenza costituzionale dell’anno 2020* (Corte costituzionale 2021).
- Newig, J., Challies, E. and Jager, N.W., “Democratic Innovation and Environmental Governance”, in S. Elstub and O. Escobar (eds.), *Handbook of Democratic Innovation and Governance* (Edward Elgar Publishing 2019) 324–338.
- Nilsson, M. and Nilsson, L.J., “Towards Climate Policy Integration in the EU: Evolving Dilemmas and Opportunities”, *Climate Policy*, 5 (2005) 363–376.
- Niro, M., *Rapporto sullo Stato dell’Ambiente – Energia* (Provincia Autonoma di Trento 2016).
- Niro, M., *Rapporto sullo Stato dell’Ambiente 2020* (Provincia Autonoma di Trento 2020).

- Nordbeck, R. and Steurer, R., “Integrated Multi-sectoral Strategies as Dead Ends of Policy Coordination: Lessons to Be Learned from Sustainable Development”, *Environment and Planning C: Government and Policy*, 34 (2016) 737–755.
- Oberthür, S., “Hard or Soft Governance? The EU’s Climate and Energy Policy Framework for 2030”, *Politics and Governance*, 7 (2019) 17–27.
- Obwexer, W., “Die Reform der Europaregion Tirol-Südtirol-Trentino: Erste Novellierung der Rechtlichen Grundlagen nach zehn Jahren”, *Europäisches Journal für Minderheitenfragen*, 3–4 (2021) 373–388.
- Obwexer, W., “Energie und Konzessionsvergabe”, in W. Obwexer et al. (eds.), *EU-Mitgliedschaft und Südtirols Autonomie. Die Auswirkungen der EU-Mitgliedschaft auf die Autonomie des Landes Südtirol am Beispiel ausgewählter Gesetzgebungs- und Verwaltungskompetenzen Handbuch* (Verlag Österreich 2015) 257–290.
- Obwexer, W., et al., (eds.), *L’impatto del diritto dell’Unione Europea sull’Autonomia dell’Alto Adige/Südtirol* (ESI 2015).
- Oppold, D., *Effekte deliberativer Demokratie am Beispiel der Bürgerräte in Vorarlberg*, Master’s thesis (University of Konstanz 2016).
- Osborne, T. and Gaebler, D., *Reinventing Government: How the Entrepreneurial Spirit Is Transforming the Public Sector* (Beacon Press 1992).
- Öhlinger, T. and Eberhard, H., *Verfassungsrecht* (facultas 2022).
- Pajno, S., “Il regionalismo italiano a vent’anni dalla riforma del Titolo V: prime riflessioni”, *Le Regioni*, 4 (2021) 81–94.
- Palermo, F., “Ruolo e natura delle commissioni paritetiche e delle norme di attuazione”, in J. Marko, S. Ortino and F. Palermo (eds.), *L’ordinamento speciale della Provincia Autonoma di Bolzano* (Cedam 2001) 832–836.
- Palermo, F. and Kössler, K., *Comparative Federalism: Constitutional Arrangements and Case Law* (Hart Publishing 2017).
- Palermo, F. and Parolari, S., (eds.), *Il futuro della specialità regionale alla luce della riforma costituzionale* (ESI 2016).
- Palermo, F. and Woelk, J., “Die Ständige Konferenz von Staat, Regionen und autonomen Provinzen in Italien”, in A. Rosner and P. Bußjäger (eds.), *Im Dienste Der Länder – Im Interesse des Gesamtstaates: Festschrift 60 Jahre Verbindungsstelle Der Bundesländer* (Braumüller 2011) 731–755.
- Papadopoulos, Y. and Warin, P., “Are Innovative, Participatory and Deliberative Procedures in Policy Making Democratic and Effective?”, *European Journal of Political Research*, 46 (2007), 445–472.
- Parker, C. and Karlsson, C., “Climate Change and the European Union’s Leadership Moment: An Inconvenient Truth?”, *Journal of Common Market Studies*, 48 (2010) 923–943.
- Parks, L., *Benefit-Sharing in Environmental Governance: Local Experiences of a Global Concept* (Routledge 2020).

- Pearce, D.W. and Warford, J.J., *World Without End: Economics, Environment, and Sustainable Development* (Oxford University Press 1993).
- Peel, J., Godden, L. and Keenan, R.J., "Climate Change Law in an Era of Multi-Level Governance", *Transnational Environmental Law*, 1 (2012) 245–280.
- Peeters, M. and Athanasiadou, N., "The Continued Effort Sharing Approach in EU Climate Law: Binding Targets, Challenging Enforcement?", *Review of European, Comparative & International Environmental Law*, 29 (2020) 201–211.
- Pellegrino, C., "Ambiente ed energia: la Corte costituzionale conferma i suoi orientamenti e il suo ruolo di supplenza ermeneutica", *Le Regioni*, 3 (2019) 843–855.
- Pernthaler, P., *Österreichisches Bundesstaatsrecht* (Verlag Österreich 2004).
- Persson, Å., "Environmental Policy Integration: An Introduction", *PINTS–Policy Integration for Sustainability Background Paper*, Stockholm Environment Institute (2004).
- Persson, Å., *et al.*, "Environmental Policy Integration: Taking Stock of Policy Practice in Different Contexts", *Environmental Science and Policy*, 85 (2018) 113–115.
- Peters, G., "Managing Horizontal Government. The Politics of Coordination", *Public Administration*, 76(2) (1998) 295–311.
- Peters, G., "What Is so Wicked About Wicked Problems? A Conceptual Analysis and a Research Program", *Policy and Society*, 36 (2017) 385–396.
- Pfefferkorn, W., *Raubildung Vorarlberg 2030. Rückmeldungen aus dem Beteiligungsprozess und ihre Berücksichtigung im Raumbild-Text. Zusammenfassung* (Rosinak & Partner 2019).
- Postal, G., "Le norme di attuazione statutaria", in M. Marcantoni, G. Postal and R. Toniatti (eds.), *Quarant'anni di autonomia. Le istituzioni e la funzione legislativa* (Franco Angeli 2011) 102–163.
- Powell, W.W. and DiMaggio, P.J., (eds.), *The New Institutionalism in Organizational Analysis* (University of Chicago Press 1991).
- Raschauer, B., "Verwaltungshandeln", in G. Holzinger, P. Oberndorfer and B. Raschauer (eds.), *Österreichische Verwaltungslehre* (Verlag Österreich 2013) 157–218.
- Rath-Kathrein, I., "Raumordnungsrecht", in P. Bußjäger and T. Müller (eds.), *Besonderes Verwaltungsrecht* (Studia 2020), 1–24.
- Rauken, T., Kristen Mydske, P. and Winsvold, M., "Mainstreaming Climate Change Adaptation at the Local Level", *Local Environment*, 20 (2015) 408–423.
- Rayner, T. and Jordan, A., "Climate Change Policy in the European Union", *Oxford Research Encyclopedias, Climate Science*, (2016).
- Revoll, J., *et al.*, *The Aarhus Convention: Tools for Compliance and Enforcement from Beyond WMD regimes* (UNIDIR 2021).
- Richardson, B., *From Student Strikes to the Extinction Rebellion: New Protest Movements Shaping our Future* (Edwar Elgar 2020).

- Ringel, M. and Knodt, M., “The Governance of the European Energy Union: Efficiency, Effectiveness and Acceptance of the Winter Package 2016”, *Energy Policy*, 112 (2018) 209–220.
- Rivosecchi, G., “L’armonizzazione dei bilanci degli enti territoriali: orientamenti e prospettive alla luce della giurisprudenza costituzionale”, *federalismi.it*, 17 (2016) 1–24.
- Rizzo, M. and Fontana, M., “Energia, clima ed economia circolare nella disciplina dell’attività edilizia (e pianificatoria)”, in M.A. Cabiddu (ed.), *Diritto del governo del territorio* (Giappichelli 2020) 265–291.
- Rolando, F., “L’attuazione del Green Deal e del Dispositivo per la ripresa e resilienza: siamo effettivamente sulla strada per raggiungere la sostenibilità ambientale?”, *Osservatorio europeo Diritto dell’Unione Europea*, (2022) 1–19.
- Ross, A. and Dovers, S., “Making the Harder Yards: Environmental Policy Integration in Australia”, *Australian Journal of Public Administration*, 67 (2008) 245–260.
- Runhaar, H., et al., “Environmental Assessment in the Netherlands: Effectively Governing Environmental Protection? A Discourse Analysis”, *Environmental Impact Assessment Review*, 39 (2013) 13–25.
- Russel, D.J., den Uyl, R.M. and de Vito, L., “Understanding Policy Integration in the EU—Insights From a Multi-Level Lens on Climate Adaptation and the EU’s Coastal and Marine Policy”, *Environmental Science and Policy*, 82 (2018) 44–51.
- Russel, D., et al., “Policy Coordination for National Climate Change Adaptation in Europe: All Process, but little Power”, *Sustainability*, 12 (2020) 1–18.
- Salvia, F. and Bevilacqua, C., *Manuale di diritto urbanistico* (Wolter Kluwer 2017).
- Savaresi, A., et al., “Making Sense of the LULUCF Regulation: Much Ado about Nothing?”, *Review of European, Comparative & International Environmental Law*, 29 (2020) 212–220.
- Schmidt, N.M. and Fleig, A., “Global Patterns of National Climate Policies: Analyzing 171 Country Portfolios on Climate Policy Integration”, *Environmental Science and Policy*, 84 (2018) 177–185.
- Schnedl, G., *Umweltrecht* (facultas 2020).
- Schreurs, M. and Tiberghien, Y., “Multi-Level Reinforcement: Explaining European Union Leadership in Climate Change Mitigation”, *Global Environmental Politics*, 7 (2007) 19–46.
- Schulev-Steindl, E., “Die Verantwortung des Staates bei der Energiewende”, *RdU-UT*, 6 (2014) 90–102.
- Sciullo, G., “Stato, Regioni, e servizi pubblici locali nella pronuncia n. 272/2004 della Consulta”, *www.lexitalia.it*, 7–8 (2004).
- Setzer, J. and Higham, C., *Global Trends in Climate Change Litigation: 2021 Snapshot*, Policy report (July 2021).
- Smorto, G. and Vinci, I., (eds.), *The Role of Sharing Mobility in Contemporary Cities. Legal, Social and Environmental Issues* (UNIPA Springer Series 2020).

- Stelzer, M., *The Constitution of the Republic of Austria: A Contextual Analysis* (Bloomsbury 2011).
- Steurer, R. and Clar, C., "The Ambiguity of Federalism in Climate Policy-Making: How the Political System in Austria Hinders Mitigation and Facilitates Adaptation", *Journal of Environmental Policy and Planning*, 20 (2018) 252–265.
- Stevenson, H. and Dryzek, J. S., *Democratizing Global Climate Governance* (Cambridge University Press 2014).
- Stuart, D., "Radical Hope: Truth, Virtue, and Hope for What Is Left in Extinction Rebellion", *Journal of Agricultural and Environmental Ethics*, 33 (2020) 487–504.
- Sutter, F. and Pfalz, T., "Verteilungsnormen und Verteilungsgerechtigkeit im Finanzverfassungs- und Finanzausgleichsrecht", in G. Baumgartner *et al.* (eds.), *Verteilungsgerechtigkeit im Recht* (Verlag Österreich 2017) 487–612.
- Szulecki, K., *et al.*, "Shaping the Energy Union: Between National Positions and Governance Innovation in EU Energy and Climate Policy", *Climate Policy*, 16 (2016) 548–567.
- Themou, M., Mikiki, F. and Markou, M., "Mobility as a Service: Implications for Spatial and Social Cohesion", in E.G. Nathanail and I.D. Karakikes (eds.), *Advances in Mobility-as-a-Service Systems. Proceedings of 5th Conference on Sustainable Urban Mobility, Virtual CSUM2020, June 17 – 19, 2020, Greece* (Springer 2021) 626–632.
- Torney, D. and O'Gorman, R., "Adaptability versus Certainty in a Carbon Emissions Reduction Regime: An Assessment of the EU's 2030 Climate and Energy Policy Framework", *Review of European, Comparative & International Environmental Law*, 29 (2020) 167–176.
- Tosun, J. and Lang, A., "Policy Integration: Mapping the Different Concepts", *Policy Studies*, 38 (2017) 553–570.
- Toth, K., *Public Participation, Sustainability and Environmental Awareness. Case Study of the Effect of Wisdom Councils on Participants in the Region Bregenzerwald*, Master's thesis (University of Copenhagen 2017).
- Trettel, M., *La democrazia partecipativa negli ordinamenti composti: studio di diritto comparato sull'incidenza della tradizione giuridica nelle democratic innovations* (ESI 2020).
- Trettel, M., "Democratic Innovations in (Subnational) Constitution-Making: The Institutionalized Case(s) of the Italian Provinces of Trento and Bolzano", *Innovation: The European Journal of Social Science Research*, 34(5) (2021) 782–802.
- Underdal, A., "Integrated Marine Policy: What? Why? How?", *Marine Policy*, 4(3) (1980) 159–169.
- Underdal, A., "Complexity and Challenges of Long-Term Environmental Governance", *Global Environmental Change*, 20 (2010) 386–393.
- Valdesalici, A., *Federalismo fiscale e responsabilizzazione politico-finanziaria: comparazione giuridica ed esercizi di misurazione del diritto* (ESI 2018).

- Van Buuren, A., *et al.*, “Towards Adaptive Spatial Planning for Climate Change: Balancing Between Robustness and Flexibility”, *Journal for European Environmental and Planning Law*, 10 (2013) 26–50.
- Vandelli, L., (ed.), *Il governo delle Regioni: sistemi politici, amministrazioni, autonomie speciali* (Il Mulino 2013).
- Wamsler, C. and Pauleit, S., “Making Headway in Climate Policy Mainstreaming and Ecosystem-Based Adaptation: Two Pioneering Countries, Different Pathways, One Goal”, *Climatic Change*, 137 (2016) 71–87.
- Weber, K. and Rath-Kathrein, I., *Kommentar Tiroler Bauordnung 2018* (Verlag Österreich 2019).
- Weiß, L., *Partizipation im Kontext nachhaltiger Stadt- und Regionalentwicklung. Eine Wirkungsforschung am Beispiel der BürgerInnen-Räte in Vorarlberg*, Master’s thesis (University of Innsbruck 2019).
- Wettestad, J., Eikeland, P.O. and Nilsson, M., “EU Climate and Energy Policy: A Hesitant Supranational Turn”, *Global Environmental Politics*, 12 (2012) 67–86.
- Winter, S. and Goel, S., *Smart Parking in Fast-Growing Cities: Challenges and Solutions* (TU Wien Academic Press 2021).
- Wirtz, B. and Birkmeyer, S., “Open Government: Origin, Development, and Conceptual Perspectives”, *International Journal of Public Administration*, 38(5) (2015) 381–396.
- Zahl, T., “Gesellschaftliche Herausforderungen und objektives Verfassungsrecht”, in M. Becker *et al.* (eds.), *Gesellschaftliche Herausforderungen – Öffentlich-rechtliche Möglichkeiten* (Jan Sramek 2019) 35–63.
- Zamponi, L., *et al.*, “(Water) Bottles and (Street) Barricades: The Politicisation of Lifestyle-centred Action in Youth Climate Strike Participation”, *Journal of Youth Studies*, 6 (2022) 1–22.
- Zebisch, M., *et al.*, *Rapporto sul Clima Alto Adige 2018* (Eurac Research 2018).
- Zito, A., “I riparti di competenze in materia di servizi pubblici locali dopo la riforma del titolo V della Costituzione”, *Diritto amministrativo*, 2 (2003) 385–410.

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