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THE LEGAL DIMENSIONS OF ENERGY SECURITY IN EU LAW

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The opinion stated in this paper and all possible errors are the Author's only.

PAROLE CHIAVE

Unione Europea, Sicurezza Energetica, Dipendenza, Affidabilità, Resilienza

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ABSTRACT

The decarbonisation of the energy sector, climate change, ageing infrastructure and the digitalization of energy networks throw policymakers into the midst of a wicked problem. The era of energy transition, as the entirety of these challenges is commonly referred to, poses serious threats to energy security and raises the question on how it can effectively be guaranteed. The issue is of utmost importance, as a lack of access to affordable energy entails far reaching consequences for a country's economy, society and politics and can cause the loss of billions. Thus, the energy security policy paradigm has gained considerable attention in the European Union (EU) throughout the past decade. In this context, law is very significant. As a regulatory authority, in fact, the EU employs legal tools to achieve its goals and to impose its "will" on national and international actors. It is, thus, the overall legal framework that gives meaning to the concept of energy security within the EU and which determines the aspects that gain relevance in a certain period of time within the EU policy.

This master's thesis investigates the EU's legal approach to the energy security policy paradigm and aims to show that it can be divided in the legal dimensions of import dependency, network reliability, climate resilience and cybersecurity, which are given different weight and are approached in divergent ways, thus ultimately shaping the relevant meaning of the paradigm. It highlights the EU's limits as supranational regulatory authority and the solutions it enacts in the attempt to overcome them, by critically analysing the pertinent policy context, the pursued strategies, legally binding and non-binding acts of the EU, and relevant case law on energy security. For this purpose, it is divided in five chapters.

The analysis shows that energy security is not a concept that originated from a legal context, but from economic and societal studies. So far, no common agreement on its precise definition and content could be reached. In respect of the EU, the concept energy security is still predominantly framed in the traditional terms of "security of supply", due to the specific restrictions in legal powers by article 194 of the Treaty on the Functioning of the European Union (TFEU) and the overall importance of the legal dimension of

import dependency, in particular regarding natural gas. However, although officially proclaiming a rather anachronistic and narrow definition of energy security, the remaining dimensions highlight a more modern approach which concerns also the segments of transmission and distribution. It is worth noting, though, that these aspects are mostly addressed with reference to the functioning and implementation of the internal energy market. The nexus between energy security and the internal energy market is, indeed, very strong throughout all the legal dimensions and based on the assumption that the full implementation and effective functioning of the latter automatically ensures the former. However, this assumption did not take into account potential market failures, legal voids or impacts of the energy transition – like the missing money problem – as a consequence of which the market price of energy does not deliver the appropriate price signals for needed investments, hence undermining energy security.

Other political and legal limits of the EU emerge throughout the analysis. The EU struggles in pursuing its diversification efforts for natural gas due to the complex geopolitical relations with other countries, *in primis* Russia. Its regulatory framework on the internal gas market entered in conflict with applicable international trade law and was partially declared inconsistent with WTO trade agreements. Moreover, it violated the principle of energy solidarity as referred to in article 194 TFEU. In respect of Nord Stream 2, the EU pursues a questionable *lex specialis* approach by pushing through an amendment to the Gas Market Directive which would bind Gazprom to the key principles of the internal energy market also in relation to transmission pipelines from third countries. The legal dimension of network reliability highlights tensions with the member states on capacity mechanisms and their compatibility with fundamental EU market rules. The chapter on climate resilience shows difficulties for the EU in establishing a comprehensive framework, be it general or sector-specific.

The thesis highlights that a goal of EU energy security policy is not only to keep Russia at bay, but also to tame the member states. Thus, a shift in competences from the member states to the EU can be observed in the energy sector. It concerns, in particular, external energy security competences as well as a stricter approach and less leeway for national

discretion in secondary legislation.

Lastly, the legal dimension of cybersecurity presents a certain incoherence in the policy approach. While the EU acknowledges the potential cross-border impacts of a cyber-incident occurring in a member state, it ultimately recognizes a primary responsibility of the member states on the matter. It also shows a new approach in energy security policy that moves away from a vertical governance model towards a more horizontal one, in which the EU limits itself to set up the institutional context where the various actors can then develop the necessary policies together.

TABLE OF CONTENTS

INTRODUCTION

"Austria gas plant burns after deadly explosion" (BBC, 2017), "Huge power outage leaves most of Venezuela in darkness" (Pozzebon & Britton, 2019), "California's massive power outages show climate change is coming for everyone, even the rich" (Coren, 2019) – the news is recently filled with headlines about electricity outages and incidents affecting energy infrastructure caused by the most various reasons. It certainly seems that the wind of change has picked up in the energy sector. The "era of energy transition", as this change is commonly referred to (Szulecki & Kusznir, 2018), throws policymakers into the midst of a wicked problem[1]: How can energy security be effectively guaranteed?

The European Union (EU) finds itself in the same conundrum. The decarbonisation of the energy sector, climate change, ageing infrastructure and the digitalization of energy networks jeopardize the continuous supply of energy to its society. Moreover, the annexation of Crimea in 2014 by Russia has once more put the delicate relationship between the EU and its most important supplier of natural gas at the centre of public and scholarly attention. The issue is of utmost importance: in fact, a lack of access to affordable energy entails far reaching consequences for a country's economy, society and politics and can cause the loss of billions.

Thus, the energy security policy paradigm has gained considerable attention in Brussels throughout the past decade. In addressing these problems, however, the EU has to face and overcome major challenges. To name but a few: the resistance from member states that are reluctant to give up on a traditionally national policy sector, the level of dependence from the Russian Federation in the context of the persisting Ukrainian crisis, the integration of unreliable renewable energy sources in the existing energy networks, environmental hazards caused by global warming that affect the energy sector already today, and the digital world with its unlimited potential for cyber-criminals. In this context, law is of the utmost importance. As a regulatory authority, in fact, the European

[1] A problem is "wicked" when it defies complete solution due to its incomplete, contradictory and changing nature.

Union employs legal tools to achieve its goals and to impose its "will" on national and international actors. It is, thus, the overall legal framework that gives meaning to the concept of energy security within the EU and which determines the aspects that gain relevance in a certain period of time within the EU policy.

This master's thesis investigates the European Union's legal approach to the energy security policy paradigm and aims to show that it can be divided in the legal dimensions of import dependency, network reliability, climate resilience and cybersecurity, which are given different weight and are approached in divergent ways, thus ultimately shaping the relevant meaning of the paradigm. It highlights the European Union's limits as supranational regulatory authority and the solutions it enacts in the attempt to overcome them, by critically analysing the pertinent policy context, the pursued strategies, legally binding and non-binding acts of the EU, and relevant case law on energy security. For this purpose, this dissertation covers the most recent developments in EU energy law, such as the WTO panel report on the Third Energy Package, the controversies revolving around the construction of the Nord Stream 2 pipeline, the new measures on risk assessment and crisis management in the gas and electricity sector as well as the most recent legal acts on cybersecurity adopted in 2019. The analysis is divided in five chapters, which will be summarized in the following paragraphs.

Chapter one introduces the reader to the ambiguous concept of energy security and analyses its evolution throughout different periods in time by evaluating the traditional attempt, the inductive attempt, the abductive attempt and the deductive attempt in defining it. Likewise, the reader will be informed that initially the treaties did not confer any specific competences on energy to the European Union. Only with the Lisbon Treaty in 2009, a legal basis for EU policy in the energy sector was introduced. However, said legal basis does not cover the external competences, i.e. the power to conclude treaties and agreements with foreign countries and third parties. A careful investigation of the legal context will shed light on the issue. The EU Energy Security Strategy explains the sudden peak in interest of the EU in energy security, and an overview on its eight key-pillars is given.

Chapter two focuses on import dependency, the first legal dimension of energy security.

It presents the European Union as one of the biggest net importers of fossil fuels in the world which majorly depends on two supplying countries, namely Norway and Russia, and explains the risk of becoming a marionette to exporting countries when an adequate level of diversification is lacking. Subsequently, it introduces the reader to the legal regime of stockholding obligations in relation to crude oil and natural gas and shows the difference in governance. In fact, while the former features a more centralized, top-down approach within an international context, the latter builds on general principles and can on its own not adequately guarantee security of natural gas. Thus, the analysis regarding the natural gas sector continues and questions whether the recently introduced cooperation and solidarity mechanisms in Regulation (EU) 2017/1938 are an effective means to shield the member states from significant supply disruptions. Lastly, the focus turns on the energy relations between the EU and key supplier Russia. The chapter highlights that this relationship is of a co-dependent nature and not just characterized by geopolitics but also by legal approaches. Hence, it concentrates on two major legal controversies between Russia and the EU. The first one concerns the World Trade Organization panel report of 2018, which declared some provisions of the Third Energy Package of the EU inconsistent with WTO law, and its impacts on EU energy security. The second controversy regards the construction of the Nord Stream 2 pipeline by Gazprom, Russia's state-owned natural gas company, and the amendment of the Gas Market Directive enacted by the EU to counter adverse effects of this new project in the natural gas sector, which also led to a shift in competences between the EU and its member states.

The third chapter on network reliability introduces the reader to the concept of reliability and the challenges it faces, notably the so-called missing money problem and the intermittency of renewable energy sources. It then shows how the EU ensures reliability. In respect of the gas sector, member states must satisfy certain supply and infrastructure standards and follow rules on cross-border congestion management. In the electricity sector, Regulation (EU) 2019/941 requires specific risk assessments and crisis scenarios. Consequently, the chapter highlights the conflict between member states and EU on capacity mechanisms, the compatibility of which with fundamental Union rules is

questionable. The chapter concludes with reward-and-penalty schemes and single-user compensation mechanisms, yet another national innovation to guarantee continuity of supply.

The fourth chapter turns to the effects of climate change in the energy sector and explains the concept of resilience. It argues that despite the many adverse impacts on all the segments of the energy supply chain (generation/importation, transmission, distribution, supply) which can already be felt today, the European Union has so far done little to ensure climate resilience, unlike in other legal dimensions, and adopted a fragmented approach by adding climate-related aspects in existing crisis management mechanisms. Consequently, the chapter highlights the recent importance of international legal acts on the matter and argues that they may influence the future course of action of the EU.

The final chapter addresses the digitalization of the energy sector and introduces the reader to new ways of organizing energy networks, i.e. Smart Grids, Smart Energy Systems and microgrids. However, due to their cyber-physical nature, these new realities are more susceptible to cyber-incidents, thus potentially endangering data integrity, availability and confidentiality. The occurrence of large-scale cyber-attacks in the past decade led to the adoption of a general strategy on cybersecurity by the EU. The chapter argues that there have been three ways in which the topic has been tackled, namely in terms of a more general security and defence policy, in economic terms and in a more comprehensive approach encompassing the former two. Thus, the legal framework is composed of acts that address cybersecurity in general and of sector-specific acts dedicated to the area of energy.

CHAPTER 1: THE ENERGY SECURITY PARADIGM

1. A problem of definitions

In order to frame energy security problems and establish a coherent energy security policy paradigm[2], the definition conferred upon the concept of "energy security" is essential. A narrower or wider understanding of this concept determines which aspects will enter the policymaker's attention and will be addressed within the energy security policy framework, and which aspects, on the contrary, will not be considered at all. Thus, the definition dictates the policy debate. However, there is no common agreement on what energy security actually means. Throughout the past decades, policymakers, scholars, as well as international organizations – such as the International Energy Agency or the United Nations – have theorized and adopted a vast variety of definitions. In fact, Azzuni and Breyer (2018) have collected 66 different meanings, whereas Ang, Choong, and Ng (2015) list even more than 80 divergent energy security definitions. This results in uncertainty of conceptual limits and confusion[3] when addressing energy security issues, with the subsequent risk that unconsidered aspects might nonetheless prove important for tackling these challenges. As a consequence, relevant problems cannot be resolved in a sufficient and/or efficient manner. In the worst case, the concept can even be abused to push through questionable measures in the name of national security.

Hence, in order to assess the energy security paradigm of the European Union, the question "What is energy security?" must be answered first, keeping in mind that approaches change based on the historical period taken in consideration (Sovacool & Brown, 2010).

[2] Within this study, a policy paradigm will be intended as a "set of coherent cognitive and normative ideas intersubjectively held by people in a given policy community about the nature of reality, social justice and the appropriate role of the state, the problem that requires public intervention, policy ends and objectives that should be pursued, and appropriate policy 'means' to achieve those ends." (Daigneault, 2015, p. 49)

[3] In fact, common words used by scholars to describe the concept of energy security are, amongst others: fuzzy, dizzying, slippery, vague, elusive, contextual (Valentine, 2011; Cherp & Jewell, 2014; Azzuni & Breyer, 2018).

1.1. The classic understanding of energy security

Academic reflection on the topic at hand started rather recently, despite energy security being a primary concern for mankind since the discovery of fire (Azzuni & Breyer, 2018). In 1976, the first explicit definition was elaborated by Willrich, characterizing energy security as "Assurance of sufficient energy supplies to permit the national economy to function in a politically acceptable manner" (Willrich, 1976, p. 747). The new attention for energy security in this period was no coincidence given the 1973 oil crisis, which had enormous effects on global petroleum prices. It led to a general awareness on the actual importance of oil as the main source of energy for military, societal and industrial development, on the implications of an uneven distribution of primary energy carriers in the world, and on the subsequent vulnerability of importing countries in terms of energy dependence (Milina, 2013). Specific measures to reduce the degree of dependence have thus been adopted, such as stockholding obligations for petroleum and other fuels. However, also exporting countries received some attention in terms of "security of demand" (Yergin, 2006, p. 71), a specular idea to security of supply, defined as continuous and reliable international demand of domestic energy (sources) to uphold export revenues. Energy security was ultimately considered a condition, situation, and not necessarily a policy (Deese, 1979). Problems were addressed on the diplomatic level or, in extremis, by warfare (a classic example is the Gulf War at the beginning of the 90s). The rising significance of natural gas changed little, for its deposits are geographically just as unevenly distributed as petroleum. Representing an alternative to oil, however, the aspect of diversification of energy sources gained more attention[4]. In the end, though, it reinforced the principle of "energy nationalism", based on which the exporting countries shaped the market behaviour and oil and natural gas were used as geopolitical weapons (Milina, 2013).

These classic definitions focus, therefore, on the security of supply and availability of energy resources at affordable prices, while the perceived threats are mainly of

[4] See, for ex., Spooner, Energy: 1973-1983 the diversification decade, 1984; Alan, Kjell, & Gunter, Security of supply in the Western European market for natural gas, 1986; Neff, Improving Energy Security in Pacific Asia: Diversification and Risk Reduction for Fossil and Nuclear Fuels, 1997.

geopolitical nature (low physical control of energy sources, embargos, arbitrary prices). External aspects stand at the centre of the analysis: geopolitical and foreign policy, continuous and reliable import and export of primary energy carriers. Although the energy sector has changed considerably throughout the last decades, many actors still adopt a classic approach to energy security. The most notable one is probably the International Energy Agency (IEA), that considers energy security to be "the uninterrupted availability of energy sources at an affordable price" (2018). This narrow understanding of energy security, however, struggles to deal with the complexities of the 21st century and the challenges the energy sector has to overcome.

1.2. Modern energy security studies. The inductive approach

In his article, Willrich (1976) has, however, already touched upon other aspects relevant for energy security, such as national security, energy efficiency, and environmental sustainability[5], thus setting the premise for the progressive and continuous introduction of more so-called "dimensions" in later definitions. In fact, already in the 80's authors put forth the theoretical need for a wider approach, going beyond the mere aspect of security of supply[6]. In the 90's, energy security was introduced as a national and regional security concern[7] (Azzuni & Breyer, 2018, p. 3). Eventually, all the arising challenges of the 21st century, notably environmental sustainability, climate change and social aspects, have been added to the "umbrella term" (Ciută, 2010, p. 126) energy security[8]. This new literature surpasses, therefore, the classic understanding of energy security in terms of

[5] In particular, one of the environmental concerns at that time was the "impending shortage of conventional oil and gas" (Attiga, 1978, p. 41), which, in absence of alternative energy sources, would have sooner or later led to an "economic apocalypse" (Milina, 2013, p. 80). However, the recent shale gas revolution that started in 2008 has considerably reduced this preoccupation.

[6] Yergin (1991) discusses in particular the sparking tensions at the end of the 1980s between a "powerful and increasing support for greater environmental protection and, on the other, a commitment to economic growth and the benefits of Hydrocarbon Society" (p. 17).

[7] See, for ex., Painter, International Oil Security and National Security, 1991; Room, Defining National Security: The Nonmilitary Aspects, 1993; Clawson, Energy and National Security in the 21st Century, 1995; Neff, Improving Energy Security in Pacific Asia: Diversification and Risk Reduction for Fossil and Nuclear Fuels, 1997.

[8] This has been described by Ciută (2010) as the "logic of total security" (p. 135): since energy affects our every aspect of life, everything is subsequently also relevant in terms of energy security.

"stable supply of cheap oil [or gas] under threats of embargoes and price manipulations by exporters" (Cherp & Jewell, 2014, p. 415) by far. In detail, Szulecki (2018, pp. 7-12) identifies three different tendencies in modern energy security studies.

The first tendency is the inductive approach. Sceptical about the sheer possibility to coin a single definition, its advocates collect all the existing definitions adopted by policy-makers and scholars, sometimes even the perceptions of citizens[9] (Sovacool, 2016), in order to disassemble them into numerous single elements, the sum of which, in turn, should guarantee a comprehensive notion and clear conceptualization of energy security. Subsequently, the concept serves as a framework within which it would be possible to measure and compare the degree of energy security in different countries.

The inductive approach is usually based on the so-called "four As" (availability, accessibility, affordability, acceptability) or variations thereof[10]. First introduced by the Asia Pacific Energy Research Centre in 2007, the theory of the "four As" was rapidly adopted by many in literature for its advantage in representing a minimal common denominator of most energy security definitions. In fact, it is hard to deny that a steady supply, a certain degree in diversity of energy sources, reasonable energy prices, and a sustainable environmental impact can, or should, be part of a sound energy security understanding. However, not only did the Asia Pacific Energy Research Centre introduce this scheme without any justification whatsoever (Cherp & Jewell, 2014), it still does not convey anything about the ontological nature of the concept, nor are specific conceptual limits established. Proof of this are the disagreements on the actual content of these four dimensions[11], as well as on the actual amount of dimensions energy security should

[9] This method consisting in surveying people about energy security is criticized decisively by Cherp (2012), who remarks that "[d]efining energy security takes more than asking around" (p. 841).

[10] For ex., according to the World Economic Forum (2009), the energy security dimensions are autonomy, reliability, affordability, and sustainability (p. 20); for Elkind (2010), the elements of energy security are availability, reliability, affordability, and sustainability; Chester (2010) addresses them as availability, adequacy, affordability, and sustainability; Sovacool & Brown (2010) refer to them as availability, accessibility, energy efficiency and environmental stewardship.

[11] See, for ex., the different meanings of availability: Sovacool & Brown (2010) describe it as "Diversifying the fuels used to provide energy services as well as the location of facilities using those fuels, promoting energy systems that can recover quickly from attack or disruption, and minimizing dependency on foreign suppliers" (p. 87); Jingzheng & Sovacool (2014) see its elements in "security of supply", "self-sufficiency", "diversification", "renewable energy", and "technological maturity" (p. 841); Azzuni & Breyer (2018), on the other hand, identify its defining parameters in "availability of energy resources", "availability of means to transform resources into services", and "availability of energy consumer" (p. 6).

comprise. Scholars try to resolve the resulting uncertainties by either

(1) adding more and more dimensions (Azzuni & Breyer, 2018); or
(2) fragmenting the "four As" into even smaller dimensions (Sovacool, 2016); or
(3) a mix of (1) and (2) (Ang, Choong, & Ng, 2015); or
(4) reforming the "four As" into other dimensions (Kisel, Hamburg, Härm, Leppiman, & Ots, 2016).

The outcome is an absurd quantity of energy security dimensions, on which a clear overview becomes quickly challenging. Numbers range from seven (Ang, Choong, & Ng, 2015) to 15 (Azzuni & Breyer, 2018), or even more dimensions (Sovacool, 2011a). A fragmentation in addressing energy security issues becomes almost inevitable, and the initial goal to deliver a comprehensive approach is ultimately defeated. The same considerations apply to similar frameworks, such as the "five Ss" (Drexel, 2009) or the "four Rs" (Hughes, 2009).

It becomes obvious that "[e]nergy security clearly means many different things to different authors and actors, and even at times to the same author or actor"[12] (Ciută, 2010, p. 127). And ultimately, "the scope of the term, […] the temporal scale that is adopted […], and critical assumptions underpinning the assessment" (Valentine, 2011, p. 56) determine the content of this subjective construct[13].

Furthermore, many authors deduce from this conceptualization indexes and metrics which should be useful to measure and quantify the degree of energy security of a given country, in order to determine and compare the energy security performance over time or between different states. However, even more uncertainties have to be tackled: the unpredictability of certain factors, the availability of data, the weight and number of criteria needed, the interconnections between indexes, as well as the even more general problem of constructing the latter (Kisel et al., 2016). In fact, the "manner in which an energy security index is constructed ultimately determines what it measures and

[12] See, for ex., Sovacool: in 2007, he claims that energy security consists in technical feasibility, affordability, environmental protection, reliability, and security of supply; in 2010, it is framed, as already seen, in terms of availability, accessibility, energy efficiency, and environmental stewardship; in 2016, he proposes even 16 different energy security dimensions.

[13] Representative of it is the quote by Professor David Victor at Stanford University: "Energy security is like a Rorschach inkblot test – you can see whatever you want to see in it." (as cited by Sovacool, 2011b, p. 3).

constitutes and what are being left out" (Ang, Choong, & Ng, 2015, p. 1088). While this attempt of measuring energy security might deliver some input for the evaluation of relevant policy changes in a given country, its high degree of subjectivity defies any clear and uniform scientific assessment and, therefore, has to be valued cautiously.

The negative aspects of this approach have eventually "led some to question the usefulness and meaningfulness of the term" (Valentine, 2011, p. 56). However, the situation is inverse: it is not the term itself of little usefulness but the inductive approach to conceptualize it.

1.3. Modern energy security studies. The abductive approach

The abductive approach tries to explain why certain definitions are adopted by policymakers and actors in the energy sector. The main representative of this scholarly current is Ciută (2010), who identifies three basic logics that, according to him, inform all the existing energy security approaches: the logic of war, the logic of subsistence, and the logic of total security. Since each logic corresponds to a different way of framing energy security problems, it is possible to explain differences in definitions adopted by various policymakers and investigate the reasons why a particular definition has been chosen. Considering energy security "a category of politics and analysis" (p. 127), Ciută emphasizes its role as a policy tool, and, eventually, elevates it to "a new, distinctive logic of security" (p. 136).

Accepting, and even valorising the contextuality of the energy security concept, the abductive approach provides interesting input for analysing and predicting the position of policymakers in energy issues. For instance, a state acting in accordance with the logic of war is more inclined to use military force for securing its energy supply. However, although explaining how and why energy security is used in the daily routine, the abductive approach does not move beyond this descriptive aspect.

1.4. Modern energy security studies. The deductive approach

This third tendency tries to determine how energy security should be understood in order to be a useful teleological concept for the relevant actors in energy policies. Rather than trying to investigate and recompose how energy security is understood among experts and policymakers, it tries to connect to classic security studies and to adapt them to the particular characteristics of energy. In particular, the notions of threat and risk gain a central importance, as well as the whole energy system as such, including infrastructure and institutions. In fact, energy security is not only relevant at the energy source or at its end use, but also during its transmission and distribution (Szulecki, 2018, p. 10).

These aspects have been taken into account particularly by Cherp and Jewell (2014) with their definition of energy security as "low vulnerability of vital energy systems" (p. 418). Drawing from the security studies of Baldwin (1997), this definition tries to provide a framework capable of answering the following three questions:

(1) Security for whom?
(2) Security from which values?
(3) Security from what threats?

Flexibility and usefulness of this definition are guaranteed by the fact that low vulnerability, vital energy systems and the threats that need to be addressed must be further specified depending on the relevant purpose. Therefore, it is "not restricted to specific sectors, elements of supply chains, or issues" (Cherp & Jewell, 2014, p. 418). While this characteristic has also been considered in negative terms[14], it serves as an "open container", susceptible to be filled with the meanings and values pursued by a certain country. In fact, "the presence of different meanings of energy security do not necessarily mean the existence of different concepts of energy security", especially considering the possibility that "the same concept finds different expressions under different conditions" (p. 416). This allows for objective benchmarks: considering, for instance, the aspect of supply, we can now identify clearly (a) the subject of the threat

[14] Azzuni and Breyer (2018), for example, criticize this definition for its "very wide, general and vague" formulation that necessitates "further explanation" (p. 4).

(the military, the households, companies, etc.), (b) the values that are endangered (the international relations, the transmission infrastructure, competition in the energy market, etc.), (c) the specific threats (cyber-attack, price volatility, missing investments for infrastructure, etc.), and assess the country's resilience and risk preparedness for this particular component of energy security. Detailed and effective framing of energy security issues is now possible, leading to a more coherent general policy.

Therefore, the deductive approach seems to be the most promising advancement in energy security studies.

1.5. The relevance of legal aspects in shaping energy security

The meaning of energy security is, however, not only shaped by the theories elaborated in the social and economic studies, but also by legal aspects. As observed by Ciută (2010), it is a concept already in use by various policymakers in the energy sector, who have tailored its contents accordingly to their legal characteristics and needs. Even before enacting legislative or regulatory measures, the legal nature of these policymakers can already determine a different understanding. The European Union, for instance, has to take into account its unique character of supranational entity and the subsequent division of powers in competences between the Union and its member states. The definition of energy security will, therefore, be wider or more restrictive depending on the extent of the competences the EU can exercise. Furthermore, international legal relations are relevant: the stability and quantity of such relations with other countries may lead to a different weight conferred to the single components of the definition. In a situation with several external energy suppliers, internal aspects become more relevant, compared to the case in which import dependency relies on few external suppliers. Energy security issues can also be caused by policy conflicts. For example, measures applied to the energy market may not deliver the necessary financial revenue to allow a sufficient expansion of transmission infrastructure, thus potentially generating a systemic vulnerability in terms of network reliability.

The legal aspects are therefore not merely the translation of the social and the economic

definitions into legal terms but constitute a *quid pluris* which actively shapes and modifies the meaning of energy security that becomes dominant in a certain area and period of time. Hence, these factors must necessarily be taken into account.
Having gained a general overview on the possible meanings and definitions, the following pages will assess the European Union's approach to energy security in more detail.

2. Energy security in EU primary legislation

The way in which the European Union conceives and addresses energy security is essentially determined by the fundamental principle of conferral. Only those legislative and regulatory powers that have expressly been conferred upon the EU institutions by the member states in primary legislation, i.e. the treaties, may be legitimately exercised by the Union. In fact, article 4, par. 1 of the Treaty on European Union (TEU) provides that "[i]n accordance with Article 5, competences not conferred upon the Union in the Treaties remain with the Member States". It is, thus, necessary to analyse the former and current EU treaties in order to understand the nature and content of EU competences in energy security.

2.1. EU energy competences before the Treaty of Lisbon

Although two of the three founding treaties of the European Union, namely the Coal and Steel Community Treaty and the Treaty establishing the European Atomic Energy Community, focused on regulating primary energy carriers as a means to achieve and maintain peace between the European countries after the horrors of the Second World War[15], responsibilities in energy policy as such have been given to the EU institutions only with the Maastricht Treaty of 1992. This has been referred to as the "paradox of integration" (Belyi, 2008) in EU energy policy: the active involvement of the

[15] In fact, coal was the main energy source at that time, which was believed to be surpassed by nuclear power in the near future.

supranational authorities in energy matters did not strip the member states of relevant competences, so that they continued to jealously guard their legislative and regulatory powers in energy matters. Energy was considered too closely tied with national security and, as a consequence, a very sensitive and delicate topic (Talus, 2016). In particular, the member states did not want to give up on the selection of the national energy-mix and the structure of the energy industry and hence refused to authorise regulation on the European level (Pielow & Lewendel, 2012).

Unsurprising is thus the vague and reluctant formulation of article 3 of the Treaty establishing the European Community (TEC), as amended by the Maastricht Treaty (Treaty on European Union), according to which the activities of the Community included, amongst others, "measures in the spheres of energy, civil protection and tourism", without any further specific empowerment. Therefore, the EU resorted to the general competences on the internal market foreseen by the treaties to introduce a progressive policy in the energy sector, in particular, article 95 TEC (approximation of laws) and the flexibility clause in article 308 TEC (Pielow & Lewendel, 2012).

In addition, two more detailed provisions were introduced by the Maastricht Treaty. Article 154 TEC prompted the Community to establish and develop trans-European networks, *inter alia*, in the area of energy infrastructures as well as to promote access, interconnection and interoperability of national networks. For this goal, specific guidelines and measures laid out in articles 155 and 156 TEC had to be adopted. Article 175 TEC, par. 2 on the other hand, invaded for the first time explicitly national energy security choices. In fact, the Council could adopt "measures significantly affecting a Member State's choice between different energy sources and the general structure of its energy supply". This opened the doors for a direct intervention in national energy security decisions regarding the energy supply and diversification of energy sources. However, the requirements were very restrictive: (a) the Council must act unanimously on a proposal from the Commission, (b) the European Parliament and the Economic and Social Committee have to be consulted, and (c) the Council must pursue at least one of the goals listed in article 174 TEC, i.e. the preservation and protection of environment and human health. Moreover, the fact that the Council represents the member states'

governments dampened the invasive power of this clause.

As can be seen, the framework of energy competences contained in the Treaty establishing the European Community was fragmented and incomplete, with almost no attention to energy security. While the development of trans-European networks was to be enacted with so-called soft law (guidelines, finance schemes, action plans), which is not legally binding, a member state's choice between different energy sources and the general structure of energy supply could only be affected when relevant for the protection of the environment, and not for compelling energy security concerns. Moreover, the rising energy demand and unpredictability of supplying countries (like Russia) called for a review and strengthening of energy security powers on EU level.

2.2. The new article 194 TFEU

The Treaty of Lisbon, which entered in force in 2009, represents the most recent turning point in EU energy powers and introduced several innovations[16] to the Treaty on European Union and to the Treaty on the Functioning of the European Union (TFEU).

Firstly, it provides a clear distinction of competences between the member states and the EU based on a "carefully balanced division of powers" (Krüger, 2016, p. 30). In fact, according to article 4, par. 2 TFEU energy is a shared competence. This means that the member states may exercise their competence only if the EU either has not already exercised its competence or has decided to stop exercising it (art. 2, par. 2 TFEU). Furthermore, the principle of subsidiarity applies: the EU can only intervene when "the objectives of the proposed action cannot be sufficiently achieved by the Member States, but can rather, by reason of the scale or effects of the proposed action, be better achieved at Union level" (art. 5, par. 3 TEU).

Secondly, a new title (Title XXI) specifically dedicated to energy policy has been introduced. Its sole article 194 TFEU specifies the powers of the EU in this sector and

[16] In fact, most of these innovations have already been foreseen by the Treaty establishing a Constitution for Europe (2005), which, however, failed to enter in force after the referendums in France and the Netherlands.

provides in its first paragraph four goals that have to be pursued:

(1) ensuring the functioning of the energy market;

(2) ensuring security of energy supply in the Union;

(3) promoting energy efficiency and energy saving and the development of new and renewable forms of energy; and

(4) promoting the interconnection of energy networks.

While the term "energy security" still does not appear in the EU treaties, article 194 TFEU expressively refers to the "security of energy supply in the Union", indicating that "ensuring the security of every member state's energy supply has to be understood as a common task" [17] (Krüger, 2016, p. 33). The second paragraph contains a proper enabling clause, granting the European Parliament and the Council the power to adopt, following the ordinary legislative procedure, all the necessary measures (thus including legally binding acts) to achieve the aforementioned goals. However, these measures meet precise limits in the second subparagraph of paragraph 2, also known as sovereignty clause (Fleming, 2017). In fact, the member states can deviate from these measures when the conditions for exploiting their domestic energy resources, the choice between different energy sources, and the general structure of their energy supply are concerned. On the other hand, measures based on article 192, par. 2 TFEU (former article 175 TEC) can overcome these national interests – except the right to determine the conditions for exploiting domestic energy resources – when "significantly" affected, by a unanimous decision of the Council. Therefore, obligations related, for example, to the promotion of renewable energy sources or the reduction of greenhouse gas emissions do not infringe art. 194, par. 2 TFEU.

Moreover, the general energy policy established by this new article has to be conducted "in a spirit of solidarity between Member States". This phrase is according to Pielow & Lewendel (2012, p. 268) interpretable in terms of a "corrective" to the principle of subsidiarity, indicating that the goals listed by article 194 can *a priori* not be sufficiently

[17] It seems preferable to adopt a wide interpretation of the wording "in the Union", referring not only to the situation in which energy supply issues affect at least two member states, jeopardizing the EU as a whole. Elsewise, the phrase "*of* the Union" would have been used, as for instance in the articles 14, 20, 86, 120 TFEU.

reached on national level, thus always legitimizing the intervention by the European Union. It is striking that the principle of solidarity emerges consistently throughout energy security provisions, for instance in the Directive 2009/119/EC imposing an obligation on member states to maintain minimum stocks of crude oil and/or petroleum products, Regulation (EU) 2017/1938 concerning measures to safeguard the security of gas supply or the new Regulation (EU) 2019/941 on risk-preparedness in the electricity sector. Moreover, article 122, par. 1 TFEU, introduced by the Treaty of Lisbon and collocated within the chapter dedicated to economic policy, contains a specific solidarity clause that confers to the Council the possibility to apply supportive measures in favour of one or more member states, "if severe difficulties arise in the supply of certain products, notably in the area of energy". Thus, it refers to the situation in which energy security is already considerably compromised, putting a member state's economic stability at risk. The principle of solidarity seems, therefore, fundamentally characterizing the governance of energy security in the EU and tries to overcome protectionist attitudes by the member states.

2.3. The appropriate legal basis for EU acts on energy security after the Lisbon Treaty

As it has been seen, article 194 TFEU is now the central provision for the identification of energy competences for the EU and contributes to the development of a coherent energy policy framework within the EU treaties. Its policy goal related to promoting the interconnection of energy networks extends, in fact, beyond the mere contribution to the development of trans-European networks foreseen by article 170, par. 1 TFEU (formerly art. 154 TEC), offering the EU the possibility to completely finance single projects, as well as more competences in the phase of planning (Krüger, 2016, p. 33). Given its nature of *lex specialis* (p. 34), for it being specifically dedicated to the EU energy policy, article 194 TFEU serves as general legal basis for all the issues it covers. However, other provisions contained in the treaties and applicable to energy matters (such as articles 122 and 192 TFEU) are not deprived of applicability: paragraph 2 explicitly states

that article 194 TFEU applies "[w]ithout prejudice to the application of other provisions of the Treaties". In practice, this can lead to difficulties in identifying and choosing the appropriate legal basis[18] for certain measures. Acts adopted on the basis of the wrong provisions of the treaties are invalid and can therefore be declared void by the Court of Justice of the European Union (CJEU) on the grounds of infringement of an essential procedural requirement *ex* articles 263 (action for annulment) and 267 (preliminary ruling concerning the validity) TFEU. In fact, the "choice of the appropriate legal basis has constitutional significance", and "since the Community has conferred powers only, it must tie […] to a Treaty provision which empowers it to approve such a measure" (Opinion 2/00 of the Court of Justice, par. 5). The indication of the legal basis is therefore crucial to assess whether the EU has the competence to act[19], which institutions have to act, and which procedure has to be followed[20]. In this context, the CJEU plays an important part in clearing up the uncertainties regarding the relationship between the various provisions of the treaties applicable to the energy sector. So far, there have been two occasions in which the Court could clarify some of the characteristics of the new energy policy framework within the EU treaties.

In the case *Poland v Commission*, T-370-11, the CJEU shed light on the relation among article 194, par. 2, and article 192, par. 2 TFEU and their respective limits. In detail, the General Court (EGC) had to decide on the action for annulment raised by the Republic of Poland of Commission Decision 2011/278/EU of 27 April 2011 determining transitional Union-wide rules for harmonised free allocation of emission allowances pursuant to Article 10a of Directive 2003/87/EC of the European Parliament and of the Council. In its first plea, Poland claimed that the Commission violated article 194, par. 2 TFEU, read in conjunction with article 192, par. 2 TFEU, by basing the emission benchmarks on natural

[18] The indication of the legal basis, that is the treaty provision that confers the EU the power to act, is an essential substantial requirement of all the legal EU acts. In fact, article 296, par. 2 TFEU provides that "[l]egal acts shall state the reasons on which they are based and shall refer to any proposals, initiatives, recommendations, requests or opinions required by the Treaties."

[19] See article 5, par. 1 TFEU: "The limits of Union competences are governed by the principle of conferral. The use of Union competences is governed by the principles of subsidiarity and proportionality."

[20] See article 13, par. 2 TEU: "Each institution shall act within the limits of the powers conferred on it in the Treaties, and in conformity with the procedures, conditions and objectives set out in them. The institutions shall practice mutual sincere cooperation."

gas for certain products affected by the greenhouse gas emission trading scheme, thus infringing on the member states' right to determine the conditions for exploiting its energy resources, its choice between different energy sources and the general structure of its energy supply. However, the Court clarified that the Decision is part of the EU environmental policy, given its nature of implementing measure to Directive 2003/87/EC, the legal basis of which is article 192 TFEU, and not article 194 TFEU. Although Poland did not contest the correctness of the legal basis of said Directive, it claimed that the member state's right described in paragraph 2 of article 194 TFEU "constitutes a principle relating to all policies of the European Union" (T-370/11, par. 16), and could therefore not be affected by measures taken in the context of other policies. However, this is not correct, according to the GC. In fact, article 194 TFEU applies exclusively to the energy sector, hence conferring only a sectoral competence to the European Union. Thus, "the right referred to in the second subparagraph of Article 194(2) TFEU is not applicable in the present case, since the contested decision constitutes an action taken by the European Union within the framework of its environment" (par. 17).

In the second case, *Parliament v Council*, C-490/10, the European Parliament asked the European Court of Justice (ECJ) to annul Council Regulation (EU, Euratom) No 617/2010 of 24 June 2010, concerning the notification to the Commission of investment projects in energy infrastructure within the European Union, for being adopted according to an incorrect legal basis, namely articles 337 TFEU and 187 Euratom. Instead, according to the European Parliament, article 194 TFEU should have been used for three reasons. Firstly, the regulation aims to "contribute to achievement of the objectives of the European Union policy on energy, set out in Article 194(1) TFEU, particularly as regards the security of energy supply" (C-490/10, par. 24). Secondly, the obligations foreseen (i.e. the collection of information and its transmission to the European Commission) are ancillary activities to reach the goals set forth in article 194, par. 1 TFEU. Lastly, the Parliament was just consulted in the procedure for the adoption of the act (even though

article 337 TFEU only requests a decision by the Council[21]), whereas article 194 TFEU requires the co-decision procedure, thus granting the Parliament significantly more powers. This last argument was immediately rebutted by the ECJ, which recalls the settled "centre of gravity" doctrine (Engel, 2018), first established in the case *Titanium Dioxide*, C-300/89, according to which "the choice of the legal basis for a European Union measure must be based on objective factors amenable to judicial review, which include the aim and content of that measure" and "where the Treaty contains a more specific provision that is capable of constituting the legal basis for the measure in question, the measure must be founded on that provision" (C-490/10, par. 44).

Little matter, therefore, the eventual benefits of a (major) democratization of the procedure from a closer involvement of the European Parliament. Hence, in principle the legal basis is not identified by the type of procedure but vice-versa[22]. Furthermore, if a measure pursues more aims or has more components arranged in a hierarchical order, so that one aim or element can be identified as the main one, the sole legal basis referred to the main purpose or element can apply. However, a measure can exceptionally be based on more than one legal basis when the multiple aims or components are "inseparably linked without one being incidental to the other" (par. 46), provided that the requested procedures are compatible with each other. Thus, the Court proceeded to assess aim and content of the contested regulation and found that both are essentially designed to allow the EU achieving the objectives foreseen by article 194, par. 1 TFEU. This however did not yet exclude article 337 TFEU as suitable legal basis. In fact, it is of general nature and enables the Commission "to collect any information needed for the achievement of the tasks which have been entrusted to it by the TFEU […] without requiring that such collection be necessary for the purpose of achieving the objectives of a given European Union policy" (par. 63-64). Article 194, par. 2 TFEU, on the other hand, is more detailed, requesting that the adopted acts are necessary to

[21] Article 337 TFEU provides as follows: "The Commission may, within the limits and under conditions laid down by the Council acting by a simple majority in accordance with the provisions of the Treaties, collect any information and carry out any checks required for the performance of the tasks entrusted to it."

[22] In fact, the Court suggested in *Kadi and Al Barakaat*, C-130/10, that "the rationale of 'democracy maximising' cannot determine by itself the correct legal basis but can only be an additional factor once the substantive requirements of a provision are fulfilled" (Engel, 2018, p. 89).

achieve the objectives of the sole EU energy policy. According to the Court, however, the provisions contained in the contested regulation are specifically related to the energy policy and appear to be "a prerequisite to the adoption by the European Union of appropriate measures" (par. 72), and thus factually necessary, to achieve the goals foreseen in article 194, par. 1 TFEU, ruling article 337 TFEU out. Similarly, article 187 EA also cannot be considered an appropriate legal base. Indeed, the contested regulation "concerns the implementation, not of European Union policy in the specific sector of nuclear energy as defined by the EAEC Treaty, but of the European Union policy on energy in general" (par. 82). Hence, the contested regulation is annulled for being adopted on an incorrect legal basis[23]. The Court confirmed that after the Treaty of Lisbon all the measures taken in the energy sector that allow the implementation of the general energy policy's objectives have to be based on article 194 TFEU. The safeguard clause "[w]ithout prejudice to the application of other provisions of the Treaties", however, has to be intended in the sense that article 194, par. 2 TFEU is only subject to the more specific provisions on energy foreseen by the TFEU. Other provisions applicable generally to all EU policies, like article 337 TFEU, can therefore not constitute a legal basis for these measures.

2.4. External energy security competences

The European Union is significantly dependent on external energy sources: in 2016, 53.6% of the consumed energy in the EU was provided by external suppliers (European Commission, 2018, p. 66). This evidence highlights the relevance of external aspects of energy security policy, wherein the competences of the EU institutions for concluding treaties and agreements with third parties on energy become crucial. However, the general provision on energy policy, article 194 TFEU, does neither explicitly foresee any external competences for the EU institutions nor implicitly refer to the possibility of a

[23] Upon request of the Parliament, the Court maintained the effects of the contested regulation until a new regulation based on article 194 TFEU has been adopted "within a reasonable period" (par. 93). To date, though, no such regulation has been passed.

foreign energy policy. On the contrary, the phrases “in a spirit of solidarity between Member States” and “security of energy supply in the Union” suggest that “external actions have not been envisioned in the energy sector, or should […] even be excluded” (Pielow & Lewendel, 2012, p. 270), even more so, when considering that the provisions in environmental policy do specify external actions by the EU[24].

The Lisbon Treaty introduced several general rules related to the Union’s external action. It officially recognized the legal personality of the EU[25], thus enabling it to negotiate international agreements and sign treaties with third countries, become a member of international organisations, and join international conventions. In fact, article 21, par. 1, subpar. 2 TEU, calls upon the EU to develop “relations and build partnerships with third countries, and international, regional or global organisations”. Therefore, the possibility to conclude supply contracts with private undertakings from third countries, for instance, is explicitly ruled out. Moreover, according to article 216 TFEU the EU can conclude international agreements in three situations: (a) when thus provided by the treaties, (b) when the conclusion of an agreement is necessary, within the framework of the EU policies, to achieve one of the objectives set forth in the treaties, or (c) when it is provided for in a legally binding EU act or is likely to affect common rules or alter their scope. However, Pielow & Lewendel (2012, p. 272) raise doubts on the applicability of this general and residuary provision, proposing the need for a narrower interpretation. In fact, if article 194 TFEU is believed to exhaustively regulate the EU energy policy, there appears to be no room left for article 216 TFEU. Furthermore, the sovereignty clause of article 194 TFEU seems to preclude external actions concerning the conditions for exploiting domestic energy resources, the national choice between different energy sources and the general structure of a member state’s energy supply. On the other hand, such an approach disregards the fact that the EU has already negotiated international agreements on energy in the past – such as the Energy Charter Treaty or the Treaty establishing the Energy Community – and there is no evidence to conclude that the participating parties to the treaties intended to negate this possibility henceforth. This

[24] For instance, article 191, par. 1 TFEU enables the EU to promote “measures at international level to deal with regional or worldwide environmental problems, and in particular combating climate change”.

[25] Article 47 TEU: “The Union shall have legal personality.”

is further backed up by the observation that the powers of the European Union on energy security and energy in general have continuously been enlarged, and not diminished. In fact, the mere presence of article 216 TFEU suggests that even if the conclusion of international agreements and the accession to international organizations are not supposed to be the general *modus operandi* in the common energy policy, they still represent possible and legitimate tools when (strictly) necessary to achieve the policy objectives or when explicitly requested by treaty provisions or legally binding acts. Admitting subsequently the possibility for the EU to carry out external actions in its energy policy, another aspect has to be analysed: the relationship of competences between the member states and the EU institutions. The Treaty of Lisbon has in this regard not clearly delineated the external division of competences. Article 3, par. 2 TFEU, however, provides information on when these competences are exclusively conferred to the EU. In fact, these competences are exclusive when the conclusion of an international agreement is (a) provided for in a legislative act of the Union, (b) is necessary to enable the Union to exercise its internal competence, or (c) may affect common rules or alters their scope. This formulation differs slightly from article 216 TFEU and is more restrictive. Article 3, par. 2 TFEU requires in situation (a) a legislative act, while in article 216 TFEU any legally binding act suffices. Moreover, in situation (b) it presupposes that an external act is necessary to simultaneously or subsequently exercise an internal competence, whereas article 216 TFEU only refers to the achievement of policy goals. Thus, "Article 216(1) can be regarded as the *lex generalis* on implied powers, with Article 3(2) as a *lex specialis*, indicating when those powers are exclusive" (Waele, 2017, p. 10). Based on a systematic and narrower interpretation, though, the EU has exclusive external competence – if the considered conditions of article 3, par. 2 TFEU are fulfilled – only in those areas that are covered by exclusive internal competence, that is, the subjects covered in article 3, par. 1 TFEU. However, as seen, energy is an area of shared internal competence. Since the treaty does not refer to any other types of external competences, there have been several "ingenious legal inventions" (Kamphof, Bonenkamp, Selleslaghs, & Hosli, 2017, p. 36), such as the concepts of shared external competences, joint responsibility or coordinated action. Either way, external actions in areas falling under

shared (internal) competence "necessitate a tandem approach of the EU and the Member States with regard to the issues at stake, as well as a joint effort in the relevant multilateral forums" (Waele, 2017, p. 12). This leads to a mixed participation in relevant international organisations and mixed agreements to which the member states must give their consent. Lately, however, the European Commission seems to circumvent all these uncertainties with informal mechanisms, such as memoranda of understanding, dialogues, partnerships, and bilateral cooperation with third countries.

The Court of Justice of the European Union, on the other hand, continues to apply the interpretation on external competences elaborated in its pre-Lisbon case law, in particular the so-called doctrine of implied powers (*ERTA*, C-22/70) according to which the member states lose the (individual or collective) right to engage in international obligations if the common rules that the EU adopted for the achievement of the objectives of the TFEU are affected. This also means, as Waele (2017) affirms, that the EU enjoys "external powers in all fields where it enjoy[s] corresponding internal powers" (p. 8). Indeed, in the case *Green Network*, C-66/13, the Court declared that article 3, par. 2 TFEU corresponds in its final part ("The Union shall also have exclusive competence for the conclusion of an international agreement […] in so far as its conclusion may affect common rules or alter their scope") to the doctrine of implied powers, in the light of which the EU's external competences have to be considered also after the Treaty of Lisbon. Therefore, the member states may not engage in international agreements which might adversely affect common EU rules or their scope. Moreover, it suffices that the international commitments taken on by the member states "largely cover" (par. 31) the area of common EU rules. Thus, in principle, the EU enjoys external competences in every subject area that has been at least harmonized, irrespective of the fact that the internal competence is exclusive or shared. In fact, *Green Network* concerned a Directive taken in the area of environmental policy, which is, just as energy, a shared competence between the EU and the member states. It follows that, according to the Court, article 3, par. 2 and article 216, par. 1 TFEU in respect of international obligations that may or are likely to affect common rules or alter their scope do not add anything to the regime of external EU competences in force before the Treaty of Lisbon.

3. The EU Energy Security Strategy

On 28 May 2014, the European Commission transmitted a Communication to the European Parliament and the Council, entitled “European Energy Security Strategy”. The purpose of this non-binding policy act was the establishment of a future action plan for strengthening energy security in the EU. The geopolitical context at this time is significant: an armed conflict had just broken out in Ukraine, which culminated in the annexation of Crimea by Russia in March 2014. The relationship between the European Union and Russia had therefore worsened considerably, calling the Commission to take action against the growing dependence of the EU on Russian fossil fuels. This explains why energy security, although identified as one of the top five priorities in the common energy policy, occupied only a minor role in the former Communications related to the “Energy 2020”, “Energy Roadmap 2050”, and “Climate and energy in the period from 2020 to 2030” policy frameworks, whereas now it represented the sole topic of an entire communication. In fact, the Commission acknowledged a former neglect on the topic and admitted that energy security had not been “on par with other considerations” in the EU energy policy so far. Evident testimony of it is the slogan that was chosen in the “Energy 2020” Communication – “competitive, sustainable and secure energy” – with the security aspect being the last of the concerns and receiving little more than formal recognition.

The new European Energy Security Strategy, which shall form “an integral part of the 2030 policy framework on climate and energy”, is built on eight so-called “key pillars”: taking immediate actions to prepare for a possible major disruption in supply during the winter of 2014/2015;

(1) strengthening solidarity and emergency mechanisms;
(2) moderating energy demand;
(3) building a well-functioning and fully integrated internal energy market;
(4) increasing EU energy production;
(5) supporting the development of energy technologies;

(6) diversifying external supplies and related infrastructure; and
(7) improving coordination of national energy policies and "speaking with one voice" in external energy policy.

Given the context above, it does not surprise that the reduction of energy dependency and the securitisation of energy supply play a major role in the EU energy security concept. No less than five of the eight key pillars are dedicated to change the "strong dependence from a single external supplier", alias Russia, and to prevent the prospective risks of major energy disruptions caused by external aspects. As the beginning of the Communication states, "[t]he European Union's prosperity and security hinges on a stable and abundant supply of energy", which has been put at risk by the recent geopolitical changes. Diversification of energy sources, improvements in energy efficiency, increasing domestic energy production and strengthening emergency mechanisms stay therefore in the focus of the EU approach.

Another main aspect is the principle of solidarity, which permeates the entire energy security strategy. The Commission laments in particular that energy security issues have traditionally been of sole national concern, leading to policy incoherencies among the member states. Therefore, the strategy calls on a more collective approach, which should consist notably in a "greater cooperation at regional and European levels" as well as in "a more coherent external action". Moreover, the member states shall provide more assistance and support between each other, with particular attention to the countries on the eastern border. However, solidarity shall not only rule the relations between the member states themselves, but also between the member states and the Union, especially in external relations. In fact, the Commission should be informed by the member states before negotiations on international agreements that could affect energy security are initiated, allowing the former to be involved in the negotiation process.

The Commission addressed not only risks originating from outside of the EU, but also by internal problem zones. In fact, a stronger integration of the internal energy market on regional level is needed to guarantee a free and flexible flow of energy across member states at all times. Construction of key-connectors, coupling of energy markets, expansion of infrastructure, and implementation of network codes are listed as

necessary activities to achieve this flexibility.

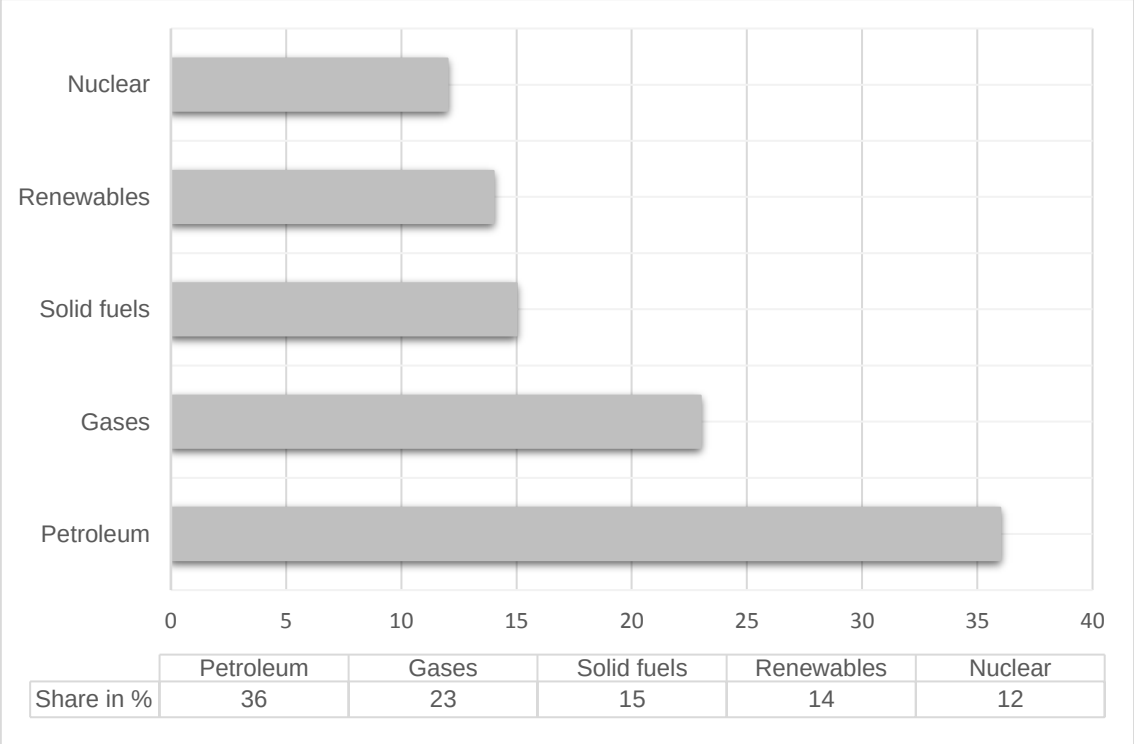
Accordingly, various measures have been adopted and are still being discussed. The following chapters will analyse in detail the steps taken by the EU for energy security in four key areas: import dependency, network reliability, climate resilience, and cybersecurity. While the former two have received major attention in the European strategy and are dimensions traditionally ascribed to energy security, the latter two have been considered only recently and still require a substantial effort in securing energy in the European Union for the future as phenomena of modern times.

CHAPTER 2: IMPORT DEPENDENCY

1. Implications of high import dependency for the European Union

Security of supply remains a vital issue for the European Union. As a net importer, it depends on external suppliers for more than half of the consumed energy. In theory, however, an elevated import dependency in itself does not necessarily pose a threat to energy supply. It has reasonably been observed – given the uneven distribution of primary energy carriers, the unpredictability of renewable energy production, and today's highly interconnected world – that total energy independence is merely a "myth" (Azzuni & Breyer, 2018, p. 8) and that import dependency becomes only an issue when diversification of energy carriers, sources and related infrastructure is missing. A lack of equivalent alternatives regarding the supply leads to a situation in which the importing country can potentially be conditioned to a high degree by the decisions of its supplier and ultimately find itself at the mercy of the latter, with energy becoming an effective

Figure 1: EU energy mix in 2017



	Petroleum	Gases	Solid fuels	Renewables	Nuclear
Share in %	36	23	15	14	12

Source: Eurostat database.

instrument by the exporting country to exercise power and imposition on the importing country. Currently, the European Union finds itself in a lack of alternatives: its gross energy consumption, according to the latest available Eurostat data, consists for the majority in fossil fuels (fig. 1), the demand of which cannot be satisfied by domestic production. In fact, in 2016 the EU energy production only amounted to 47% of the gross inland consumption (European Commission, 2018) and very few third countries are significant suppliers of fossil fuels, Russia and Norway being the most important ones of them (tables 1 and 2). Russia provides overall about a third of the oil and natural gas imported to the EU, Norway about a quarter – a significant quantity of energy sources guaranteed by only two suppliers. Moreover, some EU member states are almost completely dependent on Russia as a single supplier, such as Finland, the Baltic states and other member states in eastern Europe (for ex. Bulgaria and Romania). These

Table 1: Extra-EU imports of petroleum oil, shares of main trading partners in 2018

Partner	Share in %
Russia	27,3
Norway	11,2
Kazakhstan	8,1
Nigeria	7,8
Libyan Arab Jamahiriya	6,9
Iraq	6,6
Saudi Arabia	6,3
Iran	4,8
Azerbaijan	4,4
United States of America	3,6
Algeria	3,5
Mexico	1,7
Angola	1,3
Others	6,5

Source: Eurostat database (Comext) and Eurostat estimates.

Table 2: Extra-EU imports of natural gas, shares of main trading partners in 2018

Partner	Share in %
Russia	40,2
Norway	35,0
Algeria	11,3
Qatar	5,8
Nigeria	2,6
Libya	1,3
Others	3,8

Source: Eurostat database (Comext) and Eurostat estimates.

countries suffer particularly from the legacy of the Soviet Union's infrastructure which had been disconnected from the rest of Europe, resulting in Russia being the only physically accessible supplier of natural gas (Hoellerbauer, 2017).

While the EU keeps stable and reliable relations with Norway within the EEA framework, the partnership with Russia proves particularly challenging, not least because of the Ukrainian crisis. The adoption of restrictive measures by the EU and the response with countermeasures by Russia, as well as the efforts of the EU to impose unbundling measures on Russian gas companies for the access to import gas pipelines have determined mistrust and legal controversies. Although the European Union tries to weaken Russia's role, it is unrealistic to imagine a near future without Russian energy. As the Hungarian prime minister Viktor Orbán claimed, "locking Russia out of Europe is not rational, whoever thinks that Europe can be competitive, that the European economy can be competitive without economic cooperation with Russia, whoever thinks that energy security can exist in Europe without the energy that comes from Russia, is chasing ghosts" (2015). It is therefore crucial for EU energy security to prepare for the unpredictable fluctuations in the relationship with Russia, while gradually reducing the amount of imports and/or increasing the number of major suppliers in order to reach an acceptable level of dependency. The tensions between the EU and Russia result subsequently on one hand from the attempts by the EU to dethrone Russia as its most important supplier, on the other hand from the specular resistance of Russia.

Given this background, the legal dimension in this first segment of the energy supply chain is essential: stockholding obligations, cooperation mechanisms and solidarity obligations should make it possible to immediately react to supply interruptions and to grant flexibility to the network, while the measures of the third energy package are directly targeted at weakening Russia's power over the internal gas market. However, the fight for more diversification is ridden by legal obstacles.

2. Emergency stockholding and storage as a means to counter fuel supply risks

Stockholding obligations are not a recent development in the governance of energy security. The legal tool became essential in the aftermath of the 1973 oil crisis, when the new International Energy Agency (IEA) was tasked, among other objectives, to ensure an adequate response to future disruptions in the supply of oil among its member countries. In fact, article 2 of the Agreement on an International Energy Program (IEP), adopted on 18 November 1974 and establishing the IEA, obliges the member countries to assure "a common emergency self-sufficiency in oil supplies" by maintaining oil stocks the quantity of which is equivalent 90 days[26] of net imports. Furthermore, specific programs of demand restraint measures have to be put in place. Chapter IV of the agreement provides for the activation of two emergency measures in case of a major supply disruption of oil: the initiation of demand restraint measures and the allocation of available oil stocks to the affected member states in a spirit of collective solidarity (so-called stock draw). The trigger for these emergency measures is the "reduction in the daily rate of […] oil supplies at least equal to 7 per cent of the average daily rate of its final consumption during the base period"[27] (art. 13 and 17). In any case, according to article 22, the Governing Board can decide by unanimity to adopt any emergency measures that are not foreseen by the agreement yet necessary to govern the

[26] Initially, it sufficed that the stored oil supplies guaranteed a consumption of at least 60 days. This level has been raised to 90 days by paragraph 2 of article 2, with effect from 1st July 1975.

[27] The "base period" corresponds to the last four quarters with a delay of one quarter needed to collect information (art. 18).

contingency.

This system, however, has failed to activate in the 1979 oil crisis determined by the Iranian revolution, because the reduction in oil did not surpass the trigger of seven per cent in the IEA group. Nevertheless, the crisis had determined considerable economic damages to the member countries. This led to the adoption of the Decision on Preparation for Future Supply Disruptions (IEA/GB(81)86) and the Decision on Stocks and Supply Disruptions (IEA/GB(84)17), which introduced the so-called Co-ordinated Emergency Response Measures (CERM) (Üşenmez, 2011, p. 42). Since "oil supply disruptions involving a significant net loss of world oil supply, whether or not sufficient to activate the I.E.P. emergency oil sharing system, could result in severe economic damage to all nations of the free world" (IEA/GB(84)27, Annex 1, par. 1), CERM are based on a set of guidelines that allows the initiation of emergency response measures, upon authorization by the Governing Board, already below the seven per cent trigger. This more flexible mechanism has been able to keep the international oil markets relatively stable throughout the last decades and facilitated the mitigation of the effects on oil supply of the Gulf War in 1991, of the hurricanes in the Gulf of Mexico in 2005 and of the oil crisis in Libya in 2011 (Florini, 2011, pp. 41-42).

2.1. Stockholding obligations of crude oil and/or petroleum products for EU member states

How seriously the European Union considered energy security already in its beginnings is shown by the fact that European stockholding obligations preceded the aforementioned international framework. Already in 1968, the European Economic Community (EEC) adopted Council Directive 68/414/EEC of 20 December 1968 which imposed an obligation on member states to maintain minimum stocks of crude oil and/or petroleum products. The Directive was based on the economic policy of the EEC, and although all member states in 1968 were also signatories of the IEA, it did not represent a mere transposition of IEP and IEA rules. In fact, the recitals did not contain any references to international law at all and only paid attention to energy security

considerations for the EEC. In particular, the unpredictability of a supply crisis for crude oil and petroleum products required, according to recitals n. 2 and 3, an increase of security of supply. Therefore, the member states had to maintain oil stocks corresponding "to at least 65 days' average daily internal consumption in the preceding calendar year"[28]. Interestingly, while the IEP calculates the oil stocks based on net imports, the EEC chose the average daily internal consumption of the precedent year as criterion for calculation, thus imposing a potentially stricter stockholding obligation. Article 2 provided an exemption for member states with domestic crude oil production within the limits of the produced quantity. In any case, only those quantities that were fully at the disposal of the member states had to be considered for the stockholding obligations. Stocks of one country could also be located in the territory of another member state on the base of bilateral agreements that had to be notified to the Commission. In that case, the country hosting foreign stocks could not oppose the transfer of these stocks to other member states. Statistics on the quantity of stocks maintained at the end of every quarter year had to be transmitted to the Commission. Finally, coordination was furthermore guaranteed by consultations between the Commission and the member states when supply difficulties in the Community emerged. Council Directive 2006/67/EC of 24 July 2006 furthermore introduced a fix deduction limit of 25% from the average daily internal consumption for member states that produce crude oil and demanded fair and non-discriminatory conditions in stockholding arrangements, as well as more effort from the member states in supervising and controlling the stocks.

These rules generated, however, many uncertainties regarding the relationship of stockholding obligations between the IEA regime and EU obligations. Two aspects were especially problematic[29]:

(1) the difference in the criterion adopted to calculate emergency stocks and the reporting mechanisms lead to an administrative burden for member states that

[28] The period of 65 days has subsequently been increased to 90 days by article 1 of Council Directive 72/425/EEC of 19 December 1972.

[29] See Commission Working Staff Document: Mid-term evaluation of Council Directive 2009/119/EC imposing an obligation on Member States to maintain minimum stocks of crude oil and/or petroleum products, SWD (2017) 439 final, 24 November 2017.

were also signatories of the IEP, since adherence to the IEP rules did not automatically guarantee compliance with EU rules, and vice-versa[30]; and

(2) the ambiguity in interaction between EU and IEA, especially regarding compliance to the Directive in the case in which member states were forced to release emergency stocks under IEA rules.

In addition, the system suffered from some internal weaknesses. Many member states counted operational stocks of commercial undertakings as emergency stocks or fully delegated the stockholding to private entities, which raised questions about the immediate availability of these stocks in case of a sudden supply disruption. Moreover, it could not prevent the so-called free-riding problem, i.e. the situation in which member states with unreliable system would count on well-arranged member states, which jeopardized the risk preparedness of the Union as a whole.

Council Directive 2009/119/EC of 14 September 2009 tried to respond adequately to these problems. Unlike Council Directive 68/414/EEC, it was not adopted as part of the economic policy, but on the base of article 100 TEC which allows for the harmonization of national legislative and administrative provisions that have a "direct incidence on the establishment or functioning of the Common Market". Therefore – as seen in chapter 1 – prior to the introduction of article 194 TFEU energy security measures have been adopted on the assumption that a flawless functioning of the internal market also ensured a high level of energy security. This Directive, currently in force, addresses for the first time the commitments assumed by most member states under the IEP and the IEA and expresses the need to guarantee "greater convergence between the Community system and the system provided for by the International Energy Agency" (recital n. 4). Recital n. 28 addresses explicitly the coordination in the situation in which the IEA requests a stock draw:

"The Member States concerned should be allowed to fulfil any obligations they may be subject to as a result of a decision to release stocks taken pursuant to the IEA Agreement or its implementing measures. […] Member States should release part of their

[30] For instance, in 2000 Portugal would not have been compliant to EU law by the mere adoption of the IEP criteria, while Italy, on the other hand, would have been.

emergency stocks to the extent provided for in the IEA decision in question. The Commission should cooperate closely with IEA and […] should be in a position to recommend stock releases by all Member States, as appropriate to complement, and facilitate the implementation of, the IEA decision inviting its members to release stocks." The Commission's role shall therefore be of an intermediary between member states and IEA, supervising and facilitating the release of emergency stocks when so required by the latter. This also puts the Commission in a position of control as to how many stocks are released or remaining, permitting it to be informed at all times regarding the emergency preparedness of the whole Union.

As mentioned, particularly problematic was furthermore the difference in the criteria for calculating the minimum required stocks by the former European Community and by the IEA, which generated difficulties in coordinating the compliance with both rulesets. Hence, the new Directive tries to prevent possible conflicts between the international and the national level when trying to conform to EU rules. In fact, article 3 provides that both criteria are alternatively accepted: the maintained oil stocks have to be equivalent to "90 days of average daily net imports or 61 days of average daily inland consumption, whichever of the two quantities is greater". Commercial stocks are excluded from this calculation. The stocks calculated in this manner have to be "available and physically accessible" at all times (art. 5). The member states are, therefore, responsible for the removal and prevention of any obstacles and burdens that could restrain the availability and for the creation of arrangements for the identification, accounting and control of these stocks. Bilateral agreements are no longer needed to hold stocks abroad. Furthermore, a new sub-category of emergency stocks is introduced: specific stocks. The establishment of them is voluntary and subject to more restrictive requirements in substance (they may consist only in certain petroleum and oil products), calculation (they must correspond to the actual needs in case of a crisis) and location (they cannot be located on the territory of another member state). Furthermore, if a member state opted for specific stocks, they need to represent one third of the total stocks needed to comply with the stockholding obligations. Monthly and annual statistics of available emergency, specific and commercial stocks have to be sent to the Commission.

The Directive foresees a new body tasked with managing emergency stocks, called Central Stockholding Entity (CSE). The CSE is a “body or service without profit objective” (art. 7) and acquires, maintains and sells relevant oil stocks in the general interest for international or EU stockholding obligations. It also can, just like the government, delegate certain aspects of the management of stocks (with the exception of sale and acquisition of specific stocks) to other member States, CSEs or economic operators. Although the establishment of such an entity is optional, only five member states (Greece, Malta, Romania, Sweden, and the United Kingdom) have decided not to do so. In any case, member states that chose to maintain specific stocks are obliged to establish a CSE, as it is the only body that can own, alongside the government, specific stocks and “upon which powers may be conferred to acquire or sell” these. Only one CSE may be set up by a member state. Its legal nature, however, is not predetermined by the Directive. In most member states they take the form of an agency, while in the others they are either state-owned enterprises or industry-led (Trinomics, 2016, p. 33). A CSE is government-led when its managing members are appointed by the government; it is industry-led when the majority of the management board is composed by representatives of the oil industry. The stockholding obligations do not have to be put entirely on the CSE (except, as seen, for specific stocks), but can also be conferred upon the oil industry, thus allowing a mixed management system.

Another new institution established by the Directive 2009/119/EC is the Coordination Group for Oil and Petroleum Products. It is an advisory body and formed by representatives of the member states and the Commission, which chairs the Group. Its main tasks are the analysis of security of oil supply in the Union and the facilitation in coordinating and implementing relevant measures. The Coordination Group plays a central role in the emergency procedures laid out in article 20, as it has to be notified and consulted regarding the adoption of contingency measures, such as the release of emergency stocks. It can, therefore, be seen as an expression of the principle of solidarity between member states. Furthermore, the IEA partakes in the Group as an observer. Thus, coordination with the international level should be assured.

The member states are responsible to put in place contingency plans, procedures and

organisational measures to allow the quick, effective and transparent release of part or of all the maintained emergency stocks. They should also foresee general or specific consumption restrictions and plan the allocation of oil to certain groups on a priority basis. The procedures and plans can be reviewed by the Commission in coordination with the member states. Article 20 of the Directive provides also for three different supply emergency scenarios:

(1) stock release based on an "effective international decision"; the member states are allowed to release their stocks to comply with their international obligations, but have to notify the Commission immediately, which can decide to consult the Coordination Group. The Commission may also take the initiative and recommend to the member states, after consulting the Coordination Group, the release of their stocks, realizing its role of an intermediary defined by recital n. 28. However, it is unclear when such an international decision to release stocks has to be considered not effective. The definition contained in art. 2(e), of the Directive does not provide any indication in this regard and considers the effectiveness only referring to decisions taken by the Governing Board of the IEA. It can be assumed that an "ineffective international decision to release stocks" represents, therefore, a decision adopted by a different international organization. This would make little sense, though, considering that there are no other international stockholding obligations for oil and petroleum products than those foreseen by the IEP and the IEA. Similarly, a decision taken in lack of competence (for example, by the Ministerial Meeting instead of the Governing Board of the IEA), would not be binding for the member states anyway.

(2) difficulties of supply in the EU or to a member state in the absence of an "effective international decision"; the Commission has to inform and coordinate with the IEA as well as consult with the Coordination Group. Only if the supply disruption is deemed by the involved actors to be "major", i.e. when it consists of a "substantial and sudden drop in the supply of crude oil or petroleum products to the Community or to a Member State" (art. 2(g)), the Commission authorizes the release of emergency stocks by the member states.

(3) initial urgent response measures or local crisis; the member states can release an amount of stocks necessary in case of urgency or to counter a local crisis. The Commission has to be informed immediately and refers the information to the Coordination Group. This urgent release of stocks must not exceed the minimum level of stocks imposed by the EU stockholding obligations.

If any of these scenarios comes true, member states can temporarily hold stocks below the compulsory minimum level. Lastly, a safeguard clause provides that no international obligations of the member states are affected by the decisions of the Commission in the context of these procedures.

2.2. Problematic aspects of EU oil stockholding obligations

Even though Directive 2009/119/EC represents a significant advancement in the harmonization of stockholding obligations both between member states and the legal system of EU and IEA, it confers a lot freedom to the member states in the management of their stocks and thus raises questions on whether it represents an effective and optimal solution for security of oil supply of the Union. In particular, two key innovations of the Directive – namely the establishment of CSEs and of specific stocks – are left to the freewill of the member states, with two opposite outcomes.

23 member states have introduced CSEs. However, by 2017 only three of them (Denmark, France, Lithuania) have also established specific stocks (Trinomics, 2016, p. 175). In fact, their stricter regime without actual incentives gives little benefit to who chooses to hold specific stocks, especially considering the more complex calculation method. Furthermore, a sensible approach to energy security demands, in any case, that the petroleum products specific stocks must consist in are held in a substantial amount among the "general" emergency stocks. Therefore, this new sub-category does not contribute to more supply security and ends up being little more than an insignificant label (Trinomics, 2016, p. 51).

With regard to the model of the oil stocks management system, the Directive allows for three different possibilities:

(1) decentralized: all the stockholding obligations are incumbent on the oil industry, that is, economic operators, and no CSE is established;
(2) centralized: the CSE is the sole organization responsible for the stockholding obligations;
(3) mixed: the stockholding obligations are imposed on both the CSE and the oil industry.

It can be reasonably expected that a decentralised or mixed model presents more complexity in the coordination of the management as well as in the identification of the operator that has to release the stocks. Ensuring compliance with the stockholding obligations may also be more difficult and costly in case of a non-centralized system. Moreover, the legal nature of the CSE is not predetermined by the Directive, so that it can be government-led or industry-led, with varying degrees of influence that the government can exercise on the CSE. Even though the CSE could theoretically also be a completely private actor, this is difficult to reconcile with the requirements set out by article 7, according to which the CSE has to act in the general interest without profit objective. In any case, the different legal nature of the CSE does not appear to have a significant impact on the effective availability of oil stocks in case of emergency, as long as direct availability of the stocks is guaranteed.

Lastly, a weak point of the Directive is the absence of joint or regional risk assessments and common risk plans, as foreseen in the gas and electricity sector. Indeed, article 20 obliges the member states only to elaborate national procedures and plans, independently from each other. This could represent a potential *vulnus* to the system, when two or more member states are affected by a sudden supply disruption. Even though the Commission, together with the Coordination Group, should guarantee a common approach, the different procedures and plans set out by the member states could prevent an efficient reaction to the emergency.

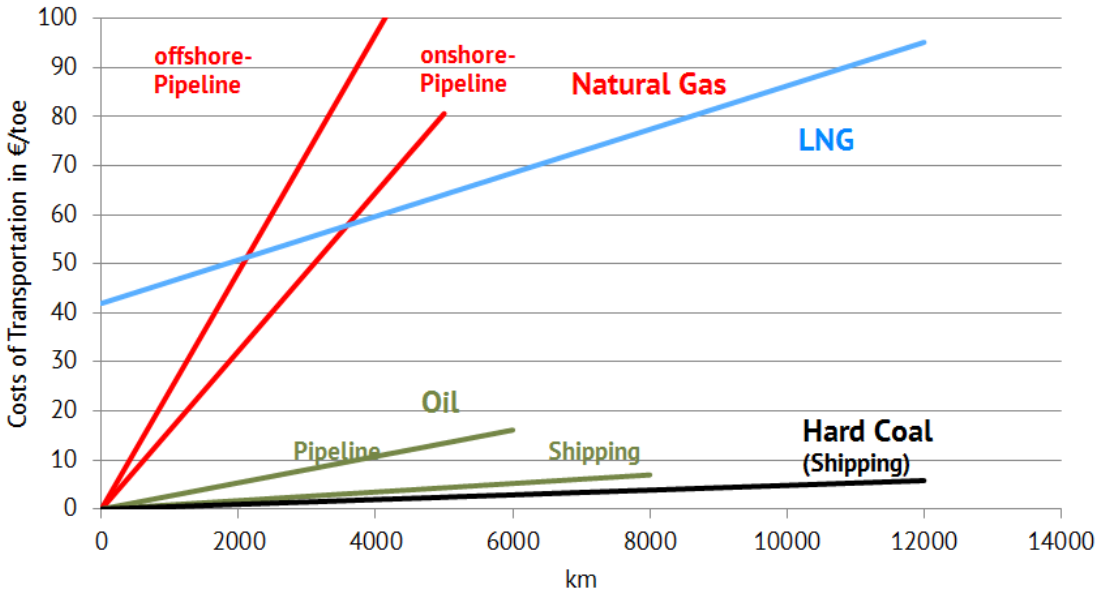
These problematic aspects have so far not been addressed either by the European Commission in its mid-term evaluation, nor in subsequent amendments. Thus, only a future supply disruption of oil and petroleum products will put the EU's regime to the test and show its actual effectiveness.

2.3. Natural gas storage for energy security

Unlike for crude oil and petroleum products, there are no storage obligations foreseen for natural gas by the IEA or by other international organizations. The main reason for this missing international attention was the lower significance of natural gas in the energy mix of the countries in the 1970s as well as the rather limited geographical extension of the gas market. Until the commercialization of liquefied natural gas (LNG) in the late 1990s, the transport of natural gas from one country to another one was only possible via pipelines, which implied a considerably higher cost than oil or coal shipments (fig. 2). The consequence of a missing world market in natural gas was therefore the relative independence of regional and local markets, as demand or supply disruptions in one part of the world did not have any significant repercussions on energy security in others.

In the absence of international drive and even though the EU gas dependency was continuously rising, gas storage facilities were not required by the EU to be immediately available to the government for releasing gas into the network in case of emergency. Nevertheless, natural gas storage is, considering its nature of "flexibility tool" (Gas

Figure 2: Comparison of transport costs of primary energy carriers over long distances



Source: Göß, 2017.

Infrastructure Europe, 2015, p. 2), crucial for energy security both in a short-term and long-term perspective. Traditionally, its main purpose is the prevention of temporary outages by balancing the demand-supply fluctuations both during the day and between the seasons – in fact, the demand of natural gas in winter can be up to six times higher than in summer[31] (OMV, 2016). Thus, it helps to maintain a stable national energy system and to hedge price risks. It also serves as an insurance in case of unexpected events that may cause supply disruptions – be it weather events, infrastructure failures or geopolitical reasons. Moreover, gas storage contributes to the liquidity of markets by assuring steady price signals with the overall advantage of being physically located close to demand areas (Gas Infrastructure Europe, 2015). Hence, many member states have introduced national public service obligations for the exploitation of gas storage to ensure energy security (European Commission, 2015). These can be divided in two categories[32]:

(1) storage obligations; a fixed amount of natural gas has to be stored during a certain period (usually winter) to safeguard sufficient supply against high peak demand. Although still allocated in the market, its use is determined by the need to assure supply standards and it represents therefore an *ex ante* measure. The member state has no direct control on the use of the storage.

(2) strategic gas reserves; a fixed amount of natural gas, usually allocated outside the market (unless its use is permitted), is stored permanently to respond non-market risks. The release of reserves is based on a decision of the member state. Strategic reserves, which are often considered equivalent to oil stocks, are therefore released *ex post* in reaction to a certain event that undermines security of gas supply.

The categories are not mutually exclusive, meaning that both storage obligations and strategic gas reserves may be introduced. Public service obligations can differ

[31] On the other hand, very high temperatures in the summer can also lead to a peak in demand of gas due to major air conditioning (International Energy Agency, 2014, p. 54).

[32] See Commission Staff Working Document, Accompanying the document Communication from the Commission to the European Parliament, the Council, the European Economic and Social Committee and the Committee of the Regions on an EU strategy for liquefied natural gas and gas storage, SWD(2016) 23 final, 16 February 2016.

substantially between the member states and are based on a variety of criteria, depending on the specific situation of the country that imposes them. Article 4 of Council Directive 2004/67/EC of 26 April 2004 concerning measures to safeguard security of natural gas supply legitimized the establishment of strategic gas reserves but did not introduce binding provisions for member states. Instead, the establishment of strategic gas storage and the cooperation between member states "to achieve the security of supply standards using gas storage facilities" with bilateral agreements was declared to be merely optional for the member states. It moreover allowed member states to "set or require the industry to set indicative minimum targets for a possible future contribution of storage". The year before, Directive 2003/55/EC had already recognized the use of public service obligations by many member countries, affirming that "[s]torage facilities are essential means, amongst other things of implementing public service obligations such as security of supply". However, "this should not lead to distortion of competition or discrimination in the access to storage." Article 3, par. 2, referring to article 86 TEC (now article 103 TFEU), explicitly allowed, therefore, the introduction of public service obligations "which may relate to security, including security of supply", provided they were clearly defined, transparent, non-discriminatory, verifiable and guaranteeing equality of access. It is worth noting that while oil stockholding obligations present a harmony in approach between international, supranational and national level, there appears to be a conflict between national energy security and energy security of the European Union regarding natural gas storage. In fact, the EU seeks to ensure energy security in a comprehensive approach encompassing also free competition and sustainability. The internal energy market is crucial in this context, as energy security is expected to be indirectly and automatically assured by the correct functioning of the former. Recital n. 1 of the Gas Market Directive (Directive 2009/73/EC) declares, indeed, that "the internal market in natural gas, which has been progressively implemented throughout the Community since 1999, aims to […] achieve efficiency gains, competitive prices, and higher standards of service, and to contribute to security of supply and sustainability." The nexus between competition, sustainability and energy security is ever-present in EU policy documents and legal tools and represents the slogan

of the EU energy framework and strategy[33]. This explains why the member states, by trying to ensure energy security on a domestic level with public service obligations that restrict access to gas storage to other market participants, may undermine the collective energy security on EU level. Uncoordinated and discriminatory national restrictions on storage access for third parties as well as a lack of information on available capacities can have undesirable spill-over effects and lead to shortcomings of natural gas supply in other member states.

Thus, regarding the storage that is offered as a service to the gas market participants, the EU took action to guarantee the non-discriminatory third-party access to available storage capacities, in the light of the integration and completion of the internal energy market and of the general underlying energy security risks. Since many storage facilities and services were owned and offered by vertically integrated undertakings, gas storage followed the liberalization of the energy markets with the First[34] and Second[35] Energy Package in 1998 and 2003, respectively, and has been, in parallel with transmission and distribution, functionally and legally separated from import/production and supply of gas. Additionally, The Sector Inquiry[36] carried out by the Commission in 2005 highlighted, indeed, that the use of gas storage infrastructure in a discriminatory manner regarding commercial storage capacities was still a concerning issue and needed closer regulatory attention (Klauser & Shavlak, 2017, p. 183). The third energy package[37] introduced a new body called "Storage System Operators" (SSOs). An SSO is any "natural or legal person who carries out the function of storage and is responsible for operating a storage facility"

[33] See, in particular, Communication from the Commission to the European Parliament, the Council, the European Economic and Social Committee and the Committee of the Regions, Energy 2020. A strategy for competitive, sustainable and secure energy, COM(2010) 639 final, 10 November 2010; Communication from the Commission to the European Parliament, the Council, the European Economic and Social Committee and the Committee of the Regions, A policy framework for climate and energy in the period from 2020 to 2030, COM(2014) 15 final, 22 January 2014.

[34] For natural gas, Directive 98/30/EC of the European Parliament and of the Council of 22 June 1998 concerning common rules for the internal market in natural gas.

[35] For natural gas, Directive 2003/55/EC of the European Parliament and of the Council of 26 June 2003 concerning common rules for the internal market in natural gas and repealing Directive 98/30/EC.

[36] See Commission Staff Working Document, Accompanying the Communication from the Commission Inquiry pursuant to Article 17 of Regulation (EC) No 1/2003 into the European gas and electricity sectors (Final Report), SEC(2006) 1724.

[37] For natural gas, Directive 2009/73/EC of the European Parliament and of the Council of 13 July 2009 concerning common rules for the internal market in natural gas and repealing Directive 2003/55/EC.

(art. 2, n. 10) designated as such by the member state or by a natural gas undertaking which owns storage (art. 12). However, the Directive 2009/73/EC did not extend to the SSOs ownership unbundling, or the alternative ITO or ISO unbundling models, which in contrast is requested for transmission system operators (TSOs).[38] Instead, stricter rules on third-party access to storage and ancillary services have been adopted for both member states and SSOs. Recitals n. 24 and 25 of Directive 2009/73/EC declare, in fact, that natural gas storage should contribute to energy security through "transparent and non-discriminatory market-based mechanisms" which are guaranteed by independent, legally separate bodies with "effective decision-making rights" on the management of storage services. In detail, article 13 of Directive 2009/73/EC dictates common rules for storage system operators, which can be summarized into three different groups:

(1) economic operation, maintenance and development of secure, reliable and efficient storage to guarantee an open market and to adequately meet service obligations;
(2) non-discrimination between system users;
(3) sufficient information-providing to other system operators to ensure secure and efficient storage of gas and to system users to grant efficient access.

Article 33 lays out two different procedures for access to natural gas storage already foreseen by Directive 2003/55/EC, which, however, are not binding for the member states. In fact, the member states can choose one of the procedures or both when "technically and/or economically necessary for providing efficient access" to customers – an evaluation ultimately left in the hands of member states. The first access procedure called "negotiated access" requires the member states or their regulatory authorities to take the necessary measures for natural gas undertakings and other customers inside or outside the territory that is covered by the interconnected system to be able to negotiate

[38] Article 15 of Directive 2009/73/EC, however, provides for the legal unbundling of storage system owners from independent system operators (ISOs), where the member state has opted for the ISO model, and from "company structures" of vertically integrated undertakings (VIUs) which are "responsible directly, or indirectly, for the day-to-day operation of the production and supply of natural gas". The staff responsible for the management of the system operator must be able to act independently and to have effective decision-making rights, independent from the VIU "with respect to assets necessary to operate, maintain or develop the storage facilities". For an explanation of the single unbundling models, see section 4.2.3.

in good faith access to storage and ancillary services. For the second procedure, referred to as “regulated access”, necessary measures have to confer natural gas undertakings and other customers a right to access based on tariffs. In any case, access can be refused for lack of capacity or incompatibility with public service obligations. This not very detailed discipline is complemented by Regulation (EC) No 715/2009 of the European Parliament and of the Council of 13 July 2009 on conditions for access to the natural gas transmission networks. Its goal is, *inter alia,* to improve and specify the implementation of existing rules on access to gas storage facilities, which was deemed “insufficient in some Member States” (recital n. 27). However, it applies, with the exception of the foreseen transparency requirements, only to storage facilities of those member states that have chosen to adopt one or both procedures *ex* article 33 of Directive 2009/73/EC. Article 15 of the Regulation concerns third-party access to storage, while article 17 lays down general principles regarding capacity-allocation and congestion-management. In detail, SSOs have to offer storage services in a non-discriminatory manner and provide relevant service information. The services must be compatible with the interconnected transport systems and facilitate access through cooperation with the transmission system operators. Offers have to include short and long-term as well as bundled and unbundled options. Furthermore, access must be firm and interruptible. Differences in tariffs may not be arbitrarily imposed for the mere fact that non-standard start dates or shorter durations of the services are negotiated. Limitations on minimum storage capacity can only be justified by technical reasons. Regarding capacity-allocation, SSOs have to offer the maximum storage available, considering public service obligations, system integrity and operation, to the market. The mechanisms for allocation have to be public, non-discriminatory, transparent, flexible, compatible with other market mechanisms, maximise capacity use and facilitate investment in new infrastructure. Congestion management shall be assured by offering unused capacity on a day-ahead and interruptible basis. Finally, storage users must be able to sell their capacity on the secondary market. Article 22 demands harmonised storage contracts and procedures to facilitate free trade of capacity. Specific transparency obligations laid out in article 19 apply to all SSOs and storage facilities and require the publication of information related

to offers and contractual conditions, tariffs, and (un)available capacity.

Access is however not only an energy security problem in terms of access to gas storage, but also in terms of access of storage facilities to the gas network in order to release stored volumes. Regarding public service obligations, stored gas will be given priority in order to balance the system (storage obligations) or to allow supply of gas (strategic gas reserves) and is regulated by the member states. For commercial gas storage, Directive 2009/73/EC imposes on the Transmission System Operators (TSOs) specific network connection obligations. In fact, article 23 requires TSOs to put in place and subject to the approval by the regulatory authority "transparent and efficient procedures and tariffs for non-discriminatory connection of storage facilities". Moreover, they cannot deny connection of a new storage facility "on the grounds of possible future limitations to available network capacities or additional costs linked with necessary [transmission] capacity increase."

In order to incentivize the construction or improvement of gas storage infrastructure, new storage facilities or significant increases of capacity in existing ones may be exempted from the rules on access to storage referred to in article 33, provided they fulfil the following conditions laid out in article 36:

(1) the infrastructure is major;
(2) the exemption has been requested;
(3) competition in gas supply and security of supply are enhanced;
(4) the exemption is necessary to obtain the needed investment;
(5) the owner of the infrastructure has to be legally separated "from the system operators in whose systems that infrastructure will be built";
(6) users of the infrastructure must bear the charges;
(7) the competition in the relevant markets which are likely to be affected, the effective functioning of the internal market in natural gas or of the concerned regulated system or the security of gas supply are not negatively affected by the exemption.

The exemption is granted on a "case-by-case basis" by the regulatory authority of the relevant member state, while the Commission can take a final decision requiring the

regulatory authority to amend or withdraw the decision to grant an exemption.

In more recent years, gas storage has been taken in consideration by the EU also in stricter terms as factor for EU energy security. This may very well be a consequence of the introduction of article 194 TFEU, which confers upon the EU the power to adopt measures to ensure security of supply, beyond the harmonization of national legislation and regulation to implement the internal energy market. Recital n. 7 of Regulation (EU) No 994/2010 of the European Parliament and of the Council of 20 October 2010 concerning measures to safeguard security of gas supply affirmed, in fact, that investments in storage facilities are one of the main elements security of supply will depend on in the future. Additionally, storage (both commercial and non-commercial) is identified as one of the factors state members have to take into account for the elaboration of Preventive Action Plans and risk assessments on security of supply. The Communication on an EU strategy for liquefied natural gas and gas storage of 16 February continues this approach and calls upon the member states to ensure that public service obligations are justified and subject to strict conditions specified in the risk assessments and plans set out by the Security of Supply Regulation. Furthermore, storage obligations and strategic reserves must not jeopardize security of supply in other member states and are not permitted to have a negative impact on competition and development of the national gas markets. Interestingly, the new Regulation (EU) 2017/1938 of the European Parliament and of the Council of 25 October 2017 concerning measures to safeguard the security of gas supply and repealing Regulation (EU) No 994/2010, identifies commercial storage also as a potential risk for energy security at interconnections between member states. In fact, “a situation could arise where firm booking of exit capacity into storage reduces the technically available capacity to be allocated at the interconnection point” (recital n. 29). Therefore, article 11 provides that, in case of supply emergency in a neighbouring member state, the capacity at an interconnection point has priority over competing capacity at exit points to storage. Fair compensation is due by the prioritized capacity user for the damages caused to the storage contract party.

2.4. Differences in EU supply risk governance of crude oil and natural gas

As seen, the EU governance in securing oil supply presents a more centralized, top-down approach. In an international context, the EU imposes specific stockholding obligations on the member states explicitly on the grounds of energy security. Although being enacted by Directives, the obligations leave little room for national discretion. The main obligations, i.e. the quantity of stocks, the management regime and the emergency mechanisms are mandatory and very specific, whereas only minor aspects, such as the establishment of specific stocks and CESs, are optional.

On the contrary, natural gas storage had primarily been of national concern, with the EU stepping in only two decades ago as coordinator and guarantee of access to commercial storage in the logic of the internal energy market. While not imposing, or even regulating, existing gas storage obligations, the market directives and regulations on security of gas supply seek to ensure non-discriminatory access to storage capacities and to avoid that non-transparent and arbitrary management of gas storage results in undesired cross-border effects. Although some key parts are mandatory (for example, the establishment of SSOs, the right to sell contracted storage on the secondary market, the consideration of natural gas storage in risk assessments), member states and SSOs enjoy more freedom in implementing these provisions. In fact, measures on access procedures, congestion-management and identification of tariffs, must, most of the time, respect only general principles or goals – such as non-discrimination, transparency, flexibility, efficiency and compatibility with the market – leaving to the member states and the SSOs the liberty to decide with which measures these principles and goals will be achieved.

These differences can partly be explained by the distinct physical properties of gas and oil (International Energy Agency, 2014, pp. 53-54). Due to the fact that natural gas is capacity-bound, transport and distribution are essentially limited by the available infrastructure, the construction of which is very costly and meets many political, geological and technical barriers. In case of damage to the downstream infrastructure, tanker trucks may distribute oil nonetheless, while gas cannot be alternatively delivered. Barriers exist also in the development of gas storage facilities. In particular, the operating

Table 3: EU supply risk governance for storage of fossil fuels

	Crude oil and petroleum	Natural gas
Role of the EU	Introduction of stock-holding obligations in addition to the IEA, since 2009 also intermediary between IEA and member states	Coordination of diverse national legal realities
Main reason of intervention	Security of supply	Implementation and functioning of the internal energy market
		Security of supply
Nature of obligations	Mandatory maintenance of a specific amount of stocks	Mandatory non-discriminatory and transparent access of market participants to commercial storage capacity
	Optional establishment of specific stocks	Voluntary adoption of public service obligations
	Optional establishment of CSEs	Mandatory establishment of legally separate SSOs
	Mandatory contingency plans and common emergency scenarios	Mandatory consideration of storage in risk assessments and contingency plans
		Mandatory adoption of common access procedures, but only when deemed necessary by the member state
Legal tools	Directive	Directive
		Regulation
		Communication

costs exceed well those required for oil storage. Natural gas needs to be contained at all time to prevent leaks and is less energy intensive than oil, meaning that it must be stored at a much higher pressure or in a liquefied form at very low temperature (p. 55). Moreover, only specific sites (such as aquifers, depleted reservoirs or caverns) are suitable to store natural gas underground. Thus, gas storage obligations imposed by the EU may enter in conflict with the second paragraph of article 194 TFEU in relation to member states that do not have enough available underground storage possibilities which, as a consequence, have to change their general structure of energy supply by constructing more expensive LNG facilities to store natural gas above ground.

The difference in legal approach has consequences for EU energy security. While it appears that security of oil supply is guaranteed by a relatively high degree, the same cannot be said about gas supply from the mere perspective of gas storage. In fact, even with the existing EU rules on storage member states and SSOs may still not be able to guarantee the security of supply on their own. Proof of this is the recent hibernal gas crisis of 2017/2018 in the United Kingdom caused by an unexpected cold snap. The shortage in supply was, *inter alia*, also the consequence of a lack of storage capacity for natural gas, which had been drastically reduced after the closure of the UK's biggest natural gas storage facility due to safety concerns in June 2017 (Moors, 2018). Moreover, the internal gas market is still very dependent on Russia as predominant supplier, making it more vulnerable to disruptions. Thus, the EU tried to further ensure the security of gas supply by other legal tools which will be discussed throughout the rest of this chapter.

3. Cooperation and solidarity mechanisms for the security of gas supply in the new Regulation (EU) 2017/1938

The liberalisation of the gas markets pushed on by the European Union throughout the past decades has led to an (almost fully) interconnected gas market between its member states. It is, therefore, of utmost importance to consider that "the risk of a major gas supply disruption to the EU is not confined to national boundaries and could directly or indirectly affect several Member States" (Ciszewski, et al., 2017, p. 90). Coordinated

action and solidarity between the latter have been identified to adequately prevent undesirable chain-reactions spreading across the Union. Hence, the European Union has gradually tackled this threat in its legal acts on security of gas supply, the latest of which – Regulation (EU) 2017/1938 – introduces two novelties: regional risk groups and a solidarity mechanism.

3.1. *Developments until 2017: solidarity as expression of cooperation and coordination*

Already the first legal act on measures to safeguard security of natural gas supply – Council Directive 2004/67/EC of 26 April 2006 – claimed that "genuine solidarity between Member States in major emergency supply situations is essential, even more so as Member States become increasingly interdependent regarding security of supply" (recital n. 13). However, this affirmation resolved into a mere political statement, as solidarity was not mentioned anymore in the rest of the Directive. In fact, the legal rules seemed to suggest that the cooperation mechanisms laid out therein are regarded to be necessary, if not sufficient, to reach such "genuine solidarity". Hence, the concept of solidarity was representing a basic principle that inspired the rules on security of supply and the behaviour of the member states in the specific context, with cooperation being the main tool to realize it. In fact, two cooperative mechanisms were foreseen:

(1) the Gas Coordination Group (GCG); chaired by the European Commission and composed of representatives of the member states and of the concerned industry and relevant consumers, the Group was tasked with facilitating the coordination of security of supply measures and the regular exchange of information on security of gas supply.

(2) the Community Emergency Mechanism (art. 9); the Commission convened the Gas Coordination Group if an event was likely to determine a major supply disruption for a significant period of time or if a member state indicated such an event when it could not be adequately managed by the prepared national emergency measures. The Group facilitated coordination of security of supply

measures at Community level and assisted the member states in coordinating national measures, taking into account all the measures adopted by the industry and the member states.

However, both in 2006 and 2009 price disputes between Ukraine and Russia lead to gas supply disruptions in some member states, evidencing that prevention and collaboration within the European Union had to be further improved beyond the initial soft touch by Directive 2004/64/EC. In particular, crisis planning needed to extend beyond national borders and acquire a regional dimension in order to take into account emergency plans of other member states and the functioning of the EU gas market. Furthermore, the member states' reactions to an emergency situation had to be further harmonized given the fact that "[s]ome declared an emergency situation and applied measures in accordance with existing emergency plans, whereas others had no detailed emergency plans in place and needed to take *ad-hoc* measures" (Ciszewski, et al., 2017, p. 91). A first attempt to address these weak points was the Third Energy Package. In fact, article 6 of Directive 2009/73/EC of the European Parliament and of the Council of 13 July 2009 concerning common rules for the internal market in natural gas invites the member states to promote regional and bilateral solidarity by cooperating, in particular in situations that are likely resulting in a severe disruption of supply affecting a member state. The cooperation should consist in coordinating national emergency measures according to Council Directive 2004/67/EC, in identifying, developing or upgrading electricity and gas interconnections, and in the establishment of conditions and practices for mutual assistance. However, due to the lack of further detail, missing guidelines, and accountability mechanisms, this provision had only a marginal impact.

Eventually, Regulation (EU) No 994/2010 of the European Parliament and of the Council of 20 October 2010 introduced "transparent mechanisms, in a spirit of solidarity, for the coordination of planning for, and response to, an emergency at Member State, regional and Union levels" (art. 1) as well as a shared responsibility that "requires a high degree of cooperation" between natural gas undertakings, member states and the Commission (art. 3) by imposing several specific collaborative duties upon them. It was the first legal instrument to directly impose strictly binding legal rules on all member states on security

of gas supply and its core rules are still in force due to the fact that the new Regulation (EU) 2017/1938 kept them in place. Recital n. 5 criticised, in fact, that "Member States still enjoy a large margin of discretion as to the choice of measures", with the "clear risk that measures developed unilaterally […] may jeopardise the proper functioning of the internal gas market and the supply of gas to customers". Hence, "it is necessary to provide for solidarity and coordination in the response to supply crises, both concerning preventive action and the reaction to concrete disruptions of supply". The Regulation highlighted that there should be a three-level approach for emergency management, with natural gas undertakings, member states and the Commission bearing a shared responsibility for security of gas supply (recitals n. 23 and n. 24) and that – recalling the wording of article 194 TFEU – regional cooperation "in a spirit of solidarity" is essential to mitigate risks and to achieve cost-effectiveness for security of gas supply measures. The regional cooperation provided for in this ruleset can take on various forms: cooperation between the competent national authorities, between the member states that require new cross-border interconnections or extensions of existing ones, among natural gas undertakings, or even with civil protection assistance provided by the EU and its member states. Important innovations, most of which have been incorporated in the new Regulation (EU) 2017/1938 and are therefore still in force, were:

(1) the designation of a single competent authority; the member states had to designate a body for the implementation of the Regulation (EU) No 994/2010 which would carry out many of the tasks and planning foreseen. This allowed also for better coordination between the member states, as it was easier to identify the competent and responsible bodies.

(2) the concept of "protected customers"; this new category comprises household customers connected to a gas distribution network and, if the member states choose to do so, also small and medium-sized enterprises and essential social services, as well as district heating installations that deliver heat to the aforementioned customers. Protected customers have to be guaranteed by a supply standard; gas supply must be ensured for a minimum of 7 or 30 days according to specific scenarios laid out in article 8, par. 1. Member states may

impose higher supply standards based on their risk assessments, as long as they do not unduly distort competition or restrain the functioning of the internal gas market or impact negatively on the ability of any other Member State to supply its protected customers in the event of an emergency.

(3) the establishment of so-called Preventive Action Plans and Emergency Plans on national level (art. 4); while the former contains measures for the elimination or mitigation of risks identified in specific risk assessments, the latter provides for measures to remove or mitigate the impact of a gas supply disruption. Both could only be adopted by the competent authorities for the implementation of the Regulation after (a) consultations with natural gas undertakings, relevant organisation that represent the interests of household and industrial gas customers and the national regulatory authority, and (b) exchanges and consultations on a regional level with competent authorities of other – in particular neighbouring – member states. The plans also have to identify how increased supply standards exceeding the criteria of article 8, par. 1 or additional obligations imposed on natural gas undertakings could be temporarily reduced when a Union or regional emergency was declared. Risk Assessment and Plans had to be primarily based on market measures and updated every 2 years. This allowed for more dynamic planning and involved more relevant actors for security of gas supply.

(4) Article 5 also allowed for the possibility to establish joint plans at regional level, in addition to the national plans, by concluding specific agreements for their implementation. However, such joint planning was merely a voluntary option for the member states and therefore did not have much success. In fact, while the Baltic States performed a Joint Risk Assessment in 2012[39], only the United Kingdom and Ireland established a Joint Preventive Action Plan in 2014[40].

[39] Commission Staff Working Document, Report on the implementation of Regulation (EU) No 994/2010 and its contribution to solidarity and preparedness for gas disruptions in the EU, SWD(2014) 325 final, 16 October 2014.

[40] https://ec.europa.eu/energy/sites/ener/files/documents/opinions_SoS%20Plans.pdf; https://www.cru.ie/wp-content/uploads/2016/07/CER16339-UK-and-Ireland-Joint-Preventive-Action-Plan-JPAP-2016.pdf.

(5) the strengthening of the Gas Coordination Group; appreciating its usefulness for exchanging information and for defining common actions between the member states, Regulation (EU) No 994/2010 extends the role of the Group for security of gas supply considerably. Besides two new bodies joining its composition (the Agency for the Cooperation of Energy Regulators and the European Network of Transmission System Operators for Gas), article 12 provides an exhaustive list of issues which require the consultation and assistance of the Group by the Commission and which go well beyond the context of a declared supply emergency within the EU. In particular, the Group is now also involved in the adoption of best practices and guidelines, in the simulation of emergency scenarios, in the assessment and implementation of Preventive Action Plans and Emergency Plans and in the coordination of measures with third countries. Furthermore, the Group must be regularly convened by the Commission.

(6) the obligation to allow bi-directional gas flow; the natural gas network in the EU had been constructed in such a way that gas flowed only from the east to the west, with no possibility to transport natural gas in the reverse direction if member states in Eastern Europe had a supply disruption. Thus, transmission system operators (TSOs) had to enable permanent bi-directional capacity on all cross-border interconnections between member states within the 3 December 2013, except for connections to production facilities, to LNG facilities and distribution networks, or where an exemption has been granted according to article 7. This provision required TSOs to present a proposal for reverse flow capacity to their member states, unless bi-directional capacity already existed and no enhancement had been requested by one or more member states for security of supply reasons. The TSOs could also apply for an exception from this obligation if there was not any benefit from reverse flow capacity considering that there would not have been any significant increase of security of supply or the investment costs would have significantly outweighed the prospective advantages for security of supply.

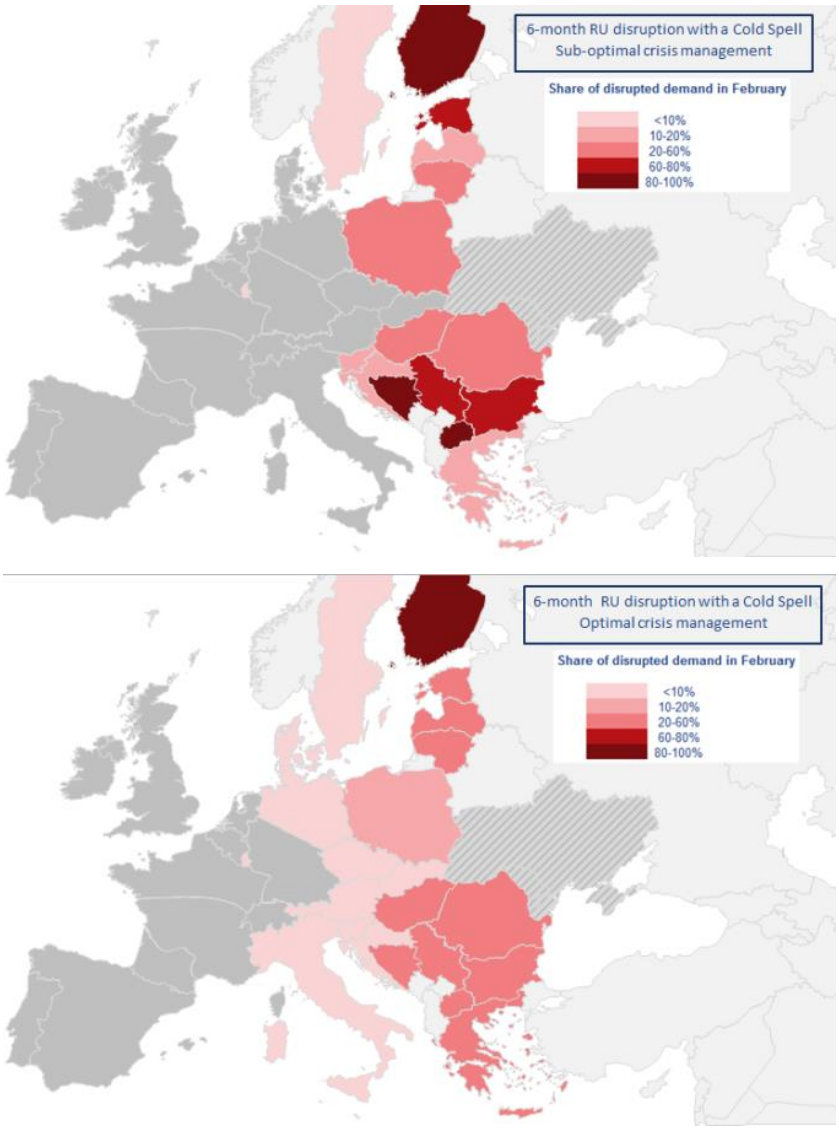
(7) the revised Union and regional emergency mechanisms; while the former Union

emergency mechanism in Directive 2004/67/CE was coordinated by the Gas Coordination Group, Regulation (EU) No 994/2010 provides that upon the request of one or two member states the Commission declares and governs a Union or regional emergency, consulted by the GCG. The Commission can also convene the crisis managers of the affected member states. If a Union or regional emergency is declared, member states are not allowed to adopt measures that unduly restrict the flow of gas within the internal market at any time nor to introduce measures that might seriously endanger the gas supply in another member state.

In 2014, the Ukrainian-Russian conflict reawakened fears about major gas disruptions in the European Union. Thus, the Commission proposed to conduct a stress test to assess the resilience and preparedness of the Union's gas system, which was endorsed by the European Council. The test was based on past natural gas crises and revealed that even though major steps had been taken for improving security of supply of the member states in a gas crisis, there were still two main weaknesses in the system that exposed the Union to severe supply disruptions in the simulated scenarios. On one hand, several infrastructure projects dedicated to enhancing security of supply had not been finished, on the other hand, the foreseen emergency strategies were still "either unilateral in nature, insufficiently coordinated and/or insufficiently cooperative"[41]. In fact, national planning resulted to still be concentrated too much on the national level rather than considering a regional approach. Furthermore, the stress test revealed, above all, a significant added value by an optimized and more efficient cooperation among the member states. By dividing the burdens of a major gas supply disruption between the member states in an optimal cooperative scenario, the negative impacts could indeed be mitigated in such a way that a sufficient amount of gas would still be available to guarantee protected customers in Eastern Europe (fig. 3).

[41] Communication from the Commission to the European Parliament and the Council on the short term resilience of the European gas system. Preparedness for a possible disruption of supplies from the East during the fall and winter of 2014/2015, COM(2014) 654, 16 October 2014, p. 16.

Figure 3: Maps of likely supply interruptions at the end of a 6-month Russian gas supply disruption scenario during a cold spell



Non-cooperative scenario

Cooperative scenario

Source: ENTSOG, 2017.

Hence, considering that security of gas supply of the EU cannot be achieved by a mere national approach of each member state and having shown that a stronger (regional) cooperation could more effectively reduce the vulnerabilities to a supply crisis, a revision of Regulation (EU) No 994/2010 was needed. On 25 October 2017, the new Regulation (EU) 2017/1938 was adopted with the specific intent to "boost solidarity and trust between the Member States and put in place the measures needed to achieve those aims" (recital n. 6). It represents therefore one of the main efforts in the context of the European Security Strategy of 2015, the second "key pillar" of which concerns

specifically the strengthening of solidarity and emergency mechanisms.

3.2. Compulsory regional cooperation and common risk assessment

The new Regulation's point of reference is precisely the stress test from 2014 and is thus based on the consideration that "purely national approaches are not very effective in the event of severe disruption, given their scope, which is by definition limited" (recital n. 1). The foreseen provisions are aimed at safeguarding the security of gas supply in the EU, *in primis*, by ensuring the proper and continuous functioning of the internal gas market. If the market can no longer deliver the required gas supplies, the new legal instrument allows for the adoption of exceptional measures in a logic of solidarity laid out therein. Lastly, the Regulation aims at establishing a clear line of responsibility and providing coordination and planning for gas supply emergencies at national, regional and Union level. Article 3 continues the already established three-level approach of Regulation (EU) No 994/2010 but includes now also "electricity undertakings where appropriate" on the first level. This evidences a concern that in the future, with the decline of coal fired power plants due to their high pollution, more gas fired power plants will be operational in the EU, so that a larger consumption of natural gas will be needed for electricity production (Fleming, 2019, p. 104). In such a scenario, a gas crisis could have even bigger impacts and an optimal emergency response will need to involve the electricity undertakings that are managing these gas fired power plants.

The first major novelty of Regulation (EU) 2017/1938 is the division of member states into 13 risk groups spread throughout four categories in Annex I: Eastern gas supply risk groups, North Sea gas supply risk groups, North African gas supply risk groups and South-East gas supply risk groups. A member state can also be part of several risk groups, depending on its role in the European gas system and its relevant supply situation (table 4). The composition of the risk groups should, in fact, reflect the actual gas supply structure in the EU and take into account the various supply sources. For example, Italy is included in the Eastern category for deliveries from Ukraine, but also in the North Sea category concerning the Norwegian gas source, as well as in all the risk groups of the

Table 4: Risk Groups for regional cooperation under Regulation (EU) 2017/1938

MS	Eastern gas supply					North Sea gas supply				North-African gas supply		Southern-East gas supply (not active)		Total
	Ukraine	*Belarus*	*Baltic Sea*	*North-Eastern*	*Trans Balkan*	*Norway*	*L-cal. gas*	*DK*	*UK*	*Algeria*	*Libya*	*South. Gas Corridor*	*Eastern Med.*	
AT	X		X							X	X	X		5
BE		X	X			X	X		X					5
BG	X				X							X		3
HR	X									X	X	X		4
CY													X	1
CZ	X	X	X											3
DK			X			X		Lead						3
EE		X		X										2
FI				X										1
FR			X			Lead	X			X				4
DE	X	X	Lead			X	X	X	X					7
EL	X				Lead					X		X	X	5
HU	X											X		2
IE						X			X					2
IT	Lead					X				X	Lead	X	X	6
LV		X		Lead										2
LT		X		X										2
LU	X	X	X			X		X	X					6
MT										X	X	X	X	4
NL		X	X			X	Lead	X	X					6
PL	X	Lead												2
PT						X				X				2
RO	X				X							X		3
SK	X	X	X									X		4
SI	X									X	X	X		4
ES						X				Lead				2
SE			X			X		X						3
UK						X			Lead					2
Total	13	10	10	4	3	12	4	5	6	9	5	10	4	

Source: European Commission.

other two categories. This reflects the high degree in diversification of the Italian natural gas supply. The attribution of member states among these risk groups *a priori* presents also an element of rigidity, that the member states were opposing critically during the legislative process. The complaints concerned mostly the "great variety of importance and roles that gas plays in the different energy mixes" of the countries. Furthermore, it was doubted that in case of a supply emergency there would be equal burden sharing, as other member state within the same risk group may enjoy exemptions from infrastructure standards, such as Slovenia (Fleming, 2019, p. 105). However, flexibility is granted by article 3, par. 8 which allows the Commission to update the composition of the risk groups in accordance with changing transnational risks of supply shortages by amending Annex I. And ultimately, the established risk groups do not prevent "any other form of regional cooperation" that the member states may set up voluntarily to strengthen security of supply. The risk groups represent, therefore, the new fundament for regional cooperation and agreements on cross-border measures, and are responsible for carrying out important tasks, the first of which is a common risk assessment that takes account of all relevant risk factors for the group's members. This assessment is expected to be more comprehensive and more precise, allowing a consistent emergency response and reducing the risk of negative spill-over effects (recital n. 11) due to the fact that the national risk assessments have to be fully consistent with the relevant groups' common risk assessment. The establishment of risk groups also has repercussions on Preventive Action Plans and Emergency Plans. In place of the mere exchange mechanism of draft plans introduced by Regulation (EU) No 994/2010 both plans must feature a so-called regional chapter for every risk group the member state is part of (art. 8, par. 3). These chapters must be elaborated jointly and agreed to by all the members of the risk group and need to comprise appropriate and effective cross-border measures. Moreover, the plans have to be drafted following specific templates laid out in Annex VI and VII of the Regulation, in order to harmonise and streamline crisis planning among the EU. The Gas Coordination Group plays a bigger role in this context as well: while previously merely consulted by the Commission on the adopted Plans, Regulation (EU) 2017/1938 provides that the GCG has to be regularly informed by the Competent

Authorities on the progress in the elaboration and adoption of the plans, with special attention to the regional chapter(s) and the cooperation mechanism the risk group has agreed on. The Preventive Action Plans and Emergency Plans had to be published and notified to the Commission by 1 March 2019. The risk assessment and both plans must be updated every 4 years thereafter. In this manner some flaws of the Regulation (EU) No 994/2010 could be overcome. Previously, in fact, risk assessment and plans were commonly drafted in the countries' mother tongue, the exchange of which bore a significant administrative burden for the other member states in terms of translating technical documents into their own language for review. Furthermore, the exchange mechanism suffered from systematic delays, so that member states were in different stages of compliance (for ex. country A was already reflecting on country B's Preventive Action Plan while country A itself had not yet finished its risk assessment) and a useful exchange was thus often impossible (Ciszewski, et al., 2017, p. 106).

Besides the GCG, the Commission is also more closely involved in this cooperative process. It has a facilitating role for the preparation of the common risk assessment and the establishment of the cooperation mechanism therefor. In case of disagreement between the members of a risk group, the Commission proposes a cooperation mechanism after consulting the relevant parties. The member states have to take "utmost account" of the proposal when deciding on their final cooperation mechanism (art. 7, par. 2). Similarly, the competent authorities have to take "account" of the Commission's proposal on a cooperation mechanism for the establishment of the plans when they cannot reach an agreement (art. 8, part. 4). The Commission also revises the adopted plans and issues an opinion on them if they are ineffective or do not comply with risk assessments, the proper functioning of the internal market or EU law. In this case, the Competent Authority can amend its plans according to the observations made by the Commission or diverge from the latter by publicly providing justification for its position. It appears, therefore, that the Commission's opinion is non-binding. In fact, the final word in this matter lies in the hands of the member states, which seems to be in line with the principle of subsidiarity ex article 5, par. 3 TFEU; indeed, the plans have to be elaborated and implemented by the member states, which most likely are more

aware of their national and regional peculiarities than the Commission may be (Fleming, 2019, p. 107).

3.3. Solidarity from vague principle to operational right

The second major novelty introduced by Regulation (EU) 2017/1938 is the solidarity mechanism of article 13, the implementation of which is another main task of the risk groups. Although the principle of solidarity is not new to European Union law[42], it gained relevance within the common energy policy rather recently. Although Directive 2004/67/EC mentions the "genuine solidarity"[43], it is only with the Treaty of Lisbon and its article 194 TFEU that the "spirit of solidarity" became the fundamental "go-to" phrase for the adoption of legal instruments in the EU energy policy. So far, however, this expression remained a political statement for justifying the introduction of certain rulesets, or if at all a general and noble objective worthy to aspire but without any concrete content[44] in secondary legislation. Until 2017, the obligation to allow bi-directional gas flow foreseen by Regulation (EU) No 994/2010 was considered the first "concrete solidarity measure" (Fleming, 2019, p. 107) to be introduced for security of gas supply, but it formally lacked any specific reference to the principle of solidarity. Moreover, the excessive grant of exemptions from this obligation undermined its overall relevance, as more than 50 percent of interconnectors "still cannot have their gas flows reversed" (Fleming, 2019, p. 107). Regulation (EU) 2017/1938 intervenes in this regard as well, restricting the number of exemptions that can be granted[45] and asking for a

[42] While in the Treaty establishing the European Economic Community (1957) the preamble refers to solidarity in an external dimension ("intending confirm the solidarity which binds Europe and overseas countries"), the Single European Act (1986) and the Maastricht Treaty (1992) introduced the promotion of economic and social cohesion and solidarity between the member states, thus establishing the principle of solidarity as a fundamental principle of the European Union.

[43] Recital n. 13 Directive 2004/67/EC: "The establishment of genuine solidarity between Member States in major emergency supply situations is essential, even more so as Member States become increasingly interdependent regarding security of supply."

[44] The recent case T-883/16, however, annulled a Commission Decision for violating the principle of energy solidarity, specifying the content of said principle. See chapter 2, section 4.2.9.

[45] An exemption can now only be granted only in case of connections to production facilities, to LNG facilities and to distribution networks (art. 5, par. 4(a)).

detailed assessment in case of already granted exemptions under Regulation (EU) No 994/2010 according to the template in Annex III. In this way, discretion of member states should be more limited in terms of interpretation and necessity assessment of exemptions from the bi-directional gas flow obligation.

The new solidarity mechanism, on the other hand, is designed to ensure the security of supply in extreme situations by reducing and spreading the effects of a gas crisis out evenly. As such, it is intended to be a measure of last resort that can be triggered by a member state in need when, despite the implementation of all the possible emergency measures, gas supply for "solidarity protected customers" cannot be guaranteed. This new category of customers is defined in a narrower way than the already familiar group of "protected customers" introduced by Regulation (EU) No 994/2010 and includes households that are connected to a gas distribution network and, optionally, essential social services (except educational and public administration) and district heating installations that deliver heating to household customers or essential social services. Article 13 provides that a country affected by the gas crisis may request a directly connected member state for solidarity if it cannot satisfy the gas supply for the solidarity protected customers. Hence, in order to invoke the right to solidarity, several requirements must be met:

(1) the market in the member state in need and in the directly connected member states fails to provide the necessary amount of natural gas;
(2) all market-based measures and all the other measures foreseen by the emergency plan have been implemented;
(3) the curtailment of customers without solidarity protection in the Member State requesting solidarity is not sufficient to guarantee supply to solidarity protected customers;
(4) the temporary reduction of increased gas supply standards or additional obligations imposed on natural gas undertakings in other member states of the same risk group is insufficient;
(5) the member state in need has notified an explicit request to the Commission and to the competent authorities of all the member states with which it is directly

connected;

The member state providing solidarity must "ensure that the gas supply to customers other than solidarity protected customers in its territory is reduced or does not continue to the extent necessary and for as long as the gas supply to solidarity protected customers in the requesting Member State is not satisfied" (art. 13, par. 1). Hence, the solidarity mechanism consists essentially in the prioritisation of supply to a certain group of customers (solidarity protected customers) over other customers in the territory of the member state providing solidarity, reducing its overall gas consumption, and in the temporary reallocation of the excess volume of gas to the requesting member state. The member state providing solidarity may be connected also via a third country, as long as gas flows are not restricted and an agreement between the relevant member state which involves the third country has been concluded. Solidarity may be provided also by non-market-based measures (for ex. curtailment of certain customer groups), if market-based measures[46] are insufficient to ensure supply to solidarity protected customers of the requesting member state. Recital n. 38 stresses that this mechanism does not require or enable a member state "to exercise public authority" in another member state. Hence, it is the responsibility of the requesting member state to ensure that the provided gas is effectively delivered to its solidarity protected customers.

Solidarity can only be provided if no "unsafe" situation is created (art. 13, par. 1) and is limited by the technically safe and reliable operation of the gas system (art. 13, par. 7). It is imaginable that these exceptions could allow an unwilling member state to circumvent its obligations by referring to the different national configuration of the gas stream and to other technical reasons, arguing that a technically safe and reliable operation would not be possible (Fleming, 2019, pp. 108-109). However, there may be purely objective reasons that limit the possibility to grant solidarity to a requesting member state[47]. In fact, the proper functioning of the solidarity mechanism

[46] Possible market-based measures are for example voluntary demand-side measures or reversed auctions, in which certain customers indicate the price at which they would reduce or stop their consumption of gas.

[47] See Annex of Commission Recommendation (EU) 2018/177 of 2 February 2018 on the elements to be included in the technical, legal and financial arrangements between Member States for the application of the solidarity mechanism under Article 13 of Regulation (EU) 2017/1938 of the European Parliament and of the Council concerning measures to safeguard the security of gas supply.

fundamentally depends on a sufficient reverse gas flow capacity, considering that a severe gas crisis requiring the initiation of the mechanism would hit the member states in Eastern Europe first, so that natural gas must be delivered from the west to the east[48]. The maximum available interconnection export capability is thus a vital element that has to be considered first. Equally, the existing infrastructure between the relevant member states must be in a condition to allow the safe reallocation and transport of natural gas. Supply to the solidarity-protected customers of the connected member state solidarity may be threatened as well, so that the necessary amount to satisfy the consumption of these customers must be taken into account. Similarly, some member states must keep critical gas-fired power plants operational to secure their electricity supply.

If more than one member state can provide solidarity, the requesting one must consult all of them, request offers and choose the "most advantageous offer on the basis of cost, speed of delivery, reliability and diversification of supplies of gas" (art. 13, par. 4). This has been referred to as a "burden-sharing mechanism" (recital n. 44). The single criteria can be discretionary interpreted by the member states and might allow the requesting country to decline offers for political rather than logistical reasons, with the risk that not an optimal solution is found. The rejection of the remaining offers suspends the obligations for those member states, but the requesting country may resubmit its request to them if the crisis worsens[49]. The Commission monitors whether the requests are justified. If a request is unjustified, the requesting member state must pay for the received gas and bear all the additional costs the helping member state incurred.

However, solidarity is not charity in case of a justified request. In fact, the requesting member state must agree to pay fair and prompt compensation to the member state providing solidarity (art. 13, par. 8). In order to be fair, the compensation must cover several elements:

(1) the gas delivered into the territory of the requesting Member State;

(2) all the other relevant and reasonable costs incurred when providing solidarity,

[48] The solidarity mechanism has, in fact, been designed to ensure cooperation with "more vulnerable member states" (recital n. 38 Regulation (EU) 2017/1938), which the stress test from 2014 has revealed to be the countries in Eastern Europe.

[49] See Annex of Commission Recommendation (EU) 2018/177.

including, where appropriate, the costs of such measures that may have been established in advance;

(3) the reimbursement for any compensation resulting from judicial proceedings, arbitration proceedings or similar proceedings and settlements and related costs of such proceedings involving the Member State providing solidarity vis-a-vis entities involved in the provision of such solidarity;

(4) all the reasonable costs that the Member State providing solidarity incurs from an obligation to pay compensation by virtue of fundamental rights guaranteed by Union law and by virtue of the applicable international obligations when implementing article 13 and further reasonable costs incurred from payment of compensation pursuant to national compensation rules (for ex. compensation claims by enterprises that suffered supply interruptions in the member state providing solidarity);

(5) the reimbursement of any costs incurred by the European Union by virtue of any liability, other than for unlawful acts or conduct pursuant to the second paragraph of Article 340 TFEU, in respect of measures that Member States are required to take pursuant to article 13 (art. 13, par. 16).

The compensation mechanism must not be used to create perverse incentives or to unduly distort the markets but should, on the contrary, provide incentives to participate in market-based solutions such as auctions and demand response mechanisms (art. 13, par. 10). In fact, speculations and perverse incentives themselves could trigger the need for solidarity. Furthermore, the compensation must not become a source of profit for the member state providing solidarity[50]. The very strict and comprehensive mechanism makes sure that triggering another member state's solidarity is not taken lightly, as many costs are associated with it. This is important to reduce the risk of "free-riders", that is the risk that member states rely on solidarity from others without taking the important steps that would avoid its necessity, as much as possible.

By 1 December 2018, member states had to take the necessary measures and conclude bilateral agreements that cover technical, legal and financial aspects to allow the proper

[50] See Annex of Commission Recommendation (EU) 2018/177.

functioning of the solidarity mechanism. Paragraph 11 grants an exemption from concluding the bilateral arrangements when the member state can cover the gas supply for its solidarity protected customers from its own production. However, it does not exempt from the obligation to provide solidarity to other member states. If the member states did not manage to conclude these agreements in due time, the Commission proposed a framework with the principles needed to make them operational. The Commission's proposal, however, was not final, as member states only had to take "utmost account" of it for the finalisation of the arrangements by 1 December 2018. If the technical, legal and financial arrangements are missing completely, the member states must agree on the necessary measures *ad hoc*.

In Commission Recommendation (EU) 2018/177 of 2 February 2018, the various elements that should be included in the technical, legal and financial arrangements between the member states for the application of the solidarity mechanism have been stated and further explained in legally non-binding guidelines. These guidelines also call the attention to the prerequisites needed to have a proper last resort solidarity mechanism. First and foremost, the Regulation (EU) 2017/1938 is based on the principle that the market should be given maximum room to solve a supply crisis on its own. Only later non-market-based measures should be implemented. Equally, the wholesale prices must not be regulated during the crisis, otherwise incorrect price signals are created that no longer reflect the actual demand for gas. Furthermore, technical and safe maintenance of cross-border access points to infrastructure has to be guaranteed at all times, so that LNG terminals, gas storage facilities, hubs and demand-side offers are always fully available to transnational market players. Finally, cooperation between member states should be established already in early emergency stages to delay the need to invoke the right to solidarity. The guidelines provide the minimum aspects for an efficient solidarity request, which should be short, standardised and equipped with a minimum amount of necessary information to allow fast responses. Recommendation (EU) 2018/177 also clarifies the start and end of the solidarity obligations. They trigger, in fact, from the moment the request is made. The request is thus immediately valid and effective and not susceptible to conditions. The member state providing solidarity ceases

to be bound by the obligations in various cases:

(1) the Commission has verified that a declaration of emergency is not or no longer justified;
(2) the solidarity-protected customers can again be supplied in a steady and continuous by the requesting member state;
(3) the gas supply of the solidarity-protected customers in the member state providing solidarity can no longer be satisfied;
(4) the requesting member state renounces on its right to solidarity; the renouncement has an *ex nunc* effect, as the received gas does not have to be returned, but fair compensation for it is due. The recommendation provides the example in which the requesting member state can no longer afford the fair compensation. However, a systematic interpretation suggests that it also allows the possibility to renounce on the right to solidarity in order to switch between offers, as the renouncement only takes effect in the bilateral relationship between the requesting member state and the member state providing solidarity, provided that the request is then resubmitted to the other member states that have issued such offers.

Although no legal form for the bilateral arrangements is foreseen by Regulation (EU) 2017/1938, it must be suitable to create rights and obligations. Their nature should not be political, but operational and legally binding. As such, a memorandum of understanding is not appropriate, whereas a binding administrative arrangement is deemed to be sufficient to oblige with article 13. Finally, it is stressed that the member states are responsible for the functioning of the solidarity mechanism, as no new specific entities for this purpose are established by Regulation (EU) 2017/1938.

3.4. State of the art: the need for better convincement

As of September 2019, half a year beyond the foreseen deadline, only seven member states[51] have submitted a Preventive Action Plan and only six member states have

[51] Czechia, Denmark, Germany, Ireland, Spain, Sweden and UK.

notified their Emergency Plan[52]. Moreover, the submitted plans only partially comply with the requirements of Regulation (EU) 2017/1938. The Commission's opinions[53] reveal that there are indeed several common shortcomings:

(1) the Preventive Action Plan and/or the Emergency Plan do not (sufficiently) follow the mandatory templates of Annex VI and VII of the Regulation (Czechia, Denmark, Ireland, Sweden, UK);
(2) the absence or superficiality of regional chapters (Czechia, Denmark, Ireland);
(3) missing information on cross-border measures and/or expected contributions of the foreseen measures (Czechia, Spain);
(4) insufficient detail of the economic, environmental and consumer impact for the measures set in place to guarantee the supply standard (Denmark, UK)
(5) the lack of detailed provisions for the application of the solidarity obligations according to art. 13 of the Regulation (Czechia, Denmark, Spain, Sweden).

As can be observed, the implementation of some of the major novelties of Regulation (EU) 2017/1938, that is the introduction of regional chapters in the crisis plans and the adoption of measures for the application of the solidarity mechanism, is so far unsatisfactory and proceeds slowly. The problems and uncertainties encountered by the member states in this phase is highlighted by the latest meetings of the Gas Coordination Group[54]. While there is good progress and high commitment within the risk groups, member states are reportedly struggling in the conclusion of the technical, legal and financial arrangements for the functioning of the solidarity mechanism. In fact, the implementation of the compensation mechanism has been declared to be the most challenging aspect.

[52] Czechia, Denmark, Greece, Ireland, Spain, Sweden.

[53] See Commission Opinion of 17 July 2019, C(2019) 5421 (for Czechia); Commission Opinion of 9 July 2019, C(2019) 5311 (for Denmark); Commission Opinion of 20 February 2019, C(2019) 1302 (for Ireland); Commission Opinion of 8 July 2019, C(2019) 5229 (for Spain); Commission Opinion of 17 July 2019, C(2019) 5422 (for Sweden); Commission Opinion of 8 July 2019, C(2019) 5238 (for UK).

[54] See Summary Note of the meeting of the Gas Coordination Group of 20 February 2018, available at https://ec.europa.eu/transparency/regexpert/index.cfm?do=groupDetail.groupMeetingDoc&docid=14844; Summary Note of the meeting of the Gas Coordination Group of 11 June 2018, available at https://ec.europa.eu/transparency/regexpert/index.cfm?do=groupDetail.groupMeetingDoc&docid=14850.

The lack of consequences for the incompliance with deadlines and the strong labelling of the solidarity mechanism as a measure of last resort may be partly to blame for the so far poor implementation of Regulation 2017/1938. In fact, the latest stress test of 21 November 2017 carried out by the European Network of Transmission System Operators for Gas (ENTSOG) as requested by article 7, par. 1 of Regulation (EU) 2017/1938, revealed that in none of the tested scenarios the solidarity mechanism would have been required to trigger. In fact, even though severe gas supply disruptions would take place in Bulgaria and Finland, the solidarity mechanism could not help mitigate the situation "as the curtailment is infrastructure related" (ENTSOG, 2017, p. 25). Thus, the problem of missing interconnection capability will have to take priority over the effective implementation of the solidarity mechanism. In the other scenarios, a different allocation of natural gas (unified allocation[55] or distance-based allocation[56]) within the risk groups would suffice to deal with the supply disruption.

However, it can be legitimately doubted that the initiation of infringement procedures against member states which are not yet compliant with Regulation (EU) 2017/1938 will lead to a successful outcome. In fact, "the imposition of solidarity in a top-down manner proved to be not very successful in the past in Regulation (EU) No 994/2010" (Fleming, 2019, p. 110). On the contrary, the Commission needs to better convince member states of the concrete advantages the new measures will bring and must set up positive incentives for the implementation thereof to effectively ensure solidarity for the security of gas supply in the European Union.

[55] All the member states within a risk group enable other supply sources and share the demand curtailment equally between each other.

[56] All the member states within a risk group enable other supply sources and let demand curtailment happen in the countries that are closer to the supply disruption.

4. The complex relationship with Russia in the ongoing Ukrainian crisis

4.1. Framing the EU-Russia energy relations

Russia is the most important trading partner of the European Union for energy. In fact, Russian energy products accounted for 60% of all extra-EU imports in 2017, providing a substantial amount of crude oil (27.3%) and natural gas (40%) to the member states. However, the situation is not as one-sided as it may seem at first glance, as Russia itself is dependent on the reliable energy markets of the EU and the revenue and investment opportunities they offer. About 90% of natural gas exports and over 60% of oil exports, which amount to 70% of all Russian exports, are destined to the European markets (Tichý, 2019, p. 18). In 2018, the revenues from energy trade with the EU amounted, according to Eurostat, to about 120 billion euro, which represent an important part of the Russian economy considering that "approximately 50% of Russia's state budget revenues are generated from the production, sale and export of energy commodities" (Vijay, 2016, p. 101) and that 40% of the GDP in Russia is obtained through the energy sector (Tichý, 2019, p. 18). The relationship between the European Union and Russia is thus of interdependent nature, but at the same time paradoxical and tense. While it appears to be in the mutual interest to establish and maintain a trusty and reliable trading partnership, the last two decades have shown distrust, threats and snarls from both parties. Scholarly literature has traditionally explained this tension in geopolitical terms by overplaying the contrasting approach in energy security governance between the EU and the Russian Federation. While the former is said to have adopted a market-based approach, considering energy a mere commodity like any other and providing legal rules for transparent conditions and clearly defined institutions, the latter is supposed to rely on a solid geopolitical paradigm, treating energy as a strategic commodity that requires state involvement in its management and *ad hoc* agreements with centralised top-down decision-making (Romanova, 2016). In fact, Dannreuther highlights that "[t]he EU is presented as a defender and promoter of a classical liberal framework, where energy security is assured through liberalisation, deregulation and promoting transnational market and regulatory frameworks. Russia, in contrast, is

presented as promoting an unreformed geopolitical and realist approach, seeking to enhance its influence and power through the 'Achilles heel' of Europe's energy dependence on Russia. In this geopolitical struggle, Ukraine acts as the strategic epicentre, a country pulled variously to Europe or back to Russia, and where the major instrument that Russia has is its 'gas weapon' so as to place pressure on both Ukraine and the EU" (2016, p. 915). This results in an oversimplification that completely neglects the historical and cultural context and ignores the complexity of energy systems and political decision-making.

Although a detailed retrace of all the factors that have contributed to the troublesome EU-Russia energy relations goes beyond the scope of this section, a short outline must be nonetheless given. It can, in fact, be observed, that the current situation is the outcome of a more general global phenomenon starting at the end of the 20th century. After the collapse of the Soviet Union, the Russian energy production was unclosed to private and foreign investments, with the "general optimism that the newly freed global markets would ensure energy security" (Dannreuther, 2016, p. 913). Rising oil prices throughout the early 2000s, however, and the appearance of new big energy consumers on the global scene – such as China and India that did not share the Western approaches – generated a shift in energy governance, with many countries trying to obtain more state control over their energy sector. Moreover, the continuous enlargement of EU and NATO towards the east over the years put Russia in a pushed back position and grew suspicion and concerns towards the West. With the Orange Revolution of 2004, Ukraine, too, adopted a pro-western attitude, which eventually led to the first deliberate temporary stops of gas supply to Europe by Russia in 2006 and 2009 (Siddi, 2017a, p. 109). Henceforth, the EU abandoned its former paternalistic approach and started to consider Russia "hostile to European values" (Dannreuther, 2016, p. 915) and a critical vulnerability to domestic energy security. Efforts in more diversification of supply sources and the reduction of dependence on Russia were put on the top of the EU agenda. While it seems easy to blame Russia for the tensions, it must be considered that – apart from expansion towards Eastern Europe – the EU regulatory framework is a source of power as well, with significant impacts on

neighbouring non-EU countries. As an outsider to the decision-making process of the EU, "Russia has only a limited voice or capacity to influence the eventual decisions taken" (p. 919) and is nonetheless subject to the full consequences of the European energy market framework. However, the path dependency created by the historically consistent energy trade between them suggests that there won't be alternatives in the near future. Even though the EU could in theory replace almost all of the oil and gas imports from Russia with other energy sources (Larrabee, et al., 2017), it can do so only in a costly way, and in this manner potentially even create new vulnerabilities. Russia, on the contrary, cannot relinquish on the European energy markets as cornerstone for its economy. In fact, the deal struck between Gazprom and the China National Petroleum Corporation in May 2014 on large-scale gas exports to China will not create competition for the European gas market, due to missing development of infrastructure for gas exports to China (Dannreuther, 2016, p. 915) and "Gazprom's inability to extract a 'European' price" (Sharples, 2016, p. 880). Thus, Russia has still every interest to remain a viable supplier for the EU. In this context, it can be observed that the newest conflict between the EU and Russia after the annexation of Crimea by the latter did, in fact, attest the stability and necessity of EU-Russia energy relations, as for both "it was important to keep energy out of the conflict and to ensure that this vital economic interdependence was not harmed by the deterioration in political relations" (Dannreuther, 2016, p. 916). This is confirmed by the content of mutual sanctions. While Russia did not consider stopping the gas and oil supply to the west, the EU sanctions targeting the Russian energy sector are very limited and only concern[57]:

(1) the sale, supply, transfer or export of certain goods and technologies used in oil exploration and production projects in deep-water, in the offshore area north of the Arctic Circle and for shale extraction;
(2) the direct or indirect provision of associated services;
(3) the sale, supply, transfer or export to Crimea or Sevastopol of certain goods and

[57] See Council Regulation (EU) No 692/2014 of 23 June 2014 concerning restrictions on the import into the Union of goods originating in Crimea or Sevastopol, in response to the illegal annexation of Crimea and Sevastopol and Council Regulation (EU) No 833/2014 of 31 July 2014 concerning restrictive measures in view of Russia's actions destabilising the situation in Ukraine.

technology used in the energy sector and for the exploration of oil, gas and mineral resources and any associated financial assistance;

(4) certain direct or indirect financial dealings with the Russian energy companies Rosneft, Transneft and Gazprom Neft.

In the same vein, it cannot be claimed that the EU-Russia energy relations are characterized solely by geopolitical approaches. The Third Energy Package, in particular, has been the focus of two major disputes conducted with legal instruments, which shall be analysed throughout this section. The first one concerns key provisions of the Package related, *inter alia*, to the unbundling of and transparent third-party access to gas infrastructure, the second controversy involves the construction of the North Stream 2 gas pipeline.

4.2. Russia's complaint to the World Trade Organization

The Third Energy Package introduced by the EU in 2009 had significant impacts on the Russian gas sector and its state-owned monopolist Gazprom. The objectives of this legislative package were, above all, the further disclosure of the European energy markets to competition by separating the transmission networks from activities related to production and supply (so-called "unbundling") and by enabling non-discriminatory third-party access to them under effective supervision of independent regulatory authorities. Other measures affecting Russian gas exports related to a required certification for third-country enterprises that operate networks on the impact for EU energy security and limitations in the construction of new pipelines. As a vertically integrated undertaking that is "focused on geological exploration, production, transportation, storage, processing and sales of gas" (Public Joint Stock Company Gazprom, 2019) and that owns "directly or through subsidiaries considerable downstream assets in the EU (mainly gas transmission systems), which fall into the scope […] of the Third Energy Package" (Wüstenberg & Talus, 2018, p. 368), Gazprom was subject to significant changes of its business model and threatened by a significant loss of influence and power in the European gas market – potentially even of its role as largest

single exporter of natural gas to the EU – with the consequence that energy security in its aspect of security of demand for Russia was challenged.

The Russian Federation has resorted repeatedly to legal instruments[58] in order to exclude or mitigate the application of this new ruleset to its energy sector (Romanova, 2016). Already during the negotiation phase of the Third Energy Package, it invoked the so-called grandfather clause contained in bilateral treaties on investment with EU member states and in the Energy Charter Treaty, which shields investments from effects *in peius* caused by successive legislation, and claimed that the new ruleset would considerably alter the investment business in Europe. Moreover, it asserted a violation of article 34 of the Agreement on Partnership and Cooperation (PCA), according to which "[t]he Parties shall use their best endeavours to avoid taking any measures or actions which render the conditions for the establishment and operation of each other's companies more restrictive than the situation existing on the day preceding the date of signature of the Agreement".

Eventually, given that the European Union continued to ignore the comments on the Package's inconsistency with legal provisions, the Russian Federation requested consultations according to the Dispute Settlement Understanding (DSU) of the World Trade Organization (WTO) on 30 April 2014 and subsequently the establishment of a panel on 11 May 2015 for a ruling on the conformity of the Third Energy Package with applicable WTO rules. This lawsuit represents the second case filed by Russia under the DSU since its accession to the WTO on 22 August 2012[59]. The almost 400-pages long panel report (*European Union and its member States – Certain Measures Relating to the Energy Sector*, WT/DS476/R) was published on 10 August 2018 and decided the controversy partially in favour of the European Union, upholding only four of the many claims raised by the Russian Federation. In order to analyse this case, however, it is first

[58] "Legal instruments include not only the use of legal arguments, but also judicial (or para-judicial) procedures to enforce them" (Romanova, 2016, p. 867).

[59] The first lawsuit (DS474) filed by Russia concerned the anti-dumping methodologies in cost adjustment employed by the EU against imports of energy-intensive goods from Russia. In short, the EU asserts that producers in the Russian market buy energy below normal value and accordingly considers the higher export prices of natural gas to the EU for its import duties instead of the costs the Russian producers actually bear for natural gas (Wüstenberg & Talus, 2018, p. 366). Although a panel was established, there has not been a ruling on the case yet.

necessary to clarify the applicability of the WTO framework to the energy sector and trade therein.

4.2.1. The paradox role of energy within the WTO framework

The energy trade sector can be regarded as the most significant one in the world (Leal-Arcas & Abu Gosh, 2014, p. 2). It is estimated that half of the world trade in services is significantly dependent on energy (p. 6) and since the deposits of primary energy carriers are unevenly distributed in the world, countries have been engaging in the trade of these natural resources and of associated services to ensure a stable and continuous energy supply at an affordable cost. Thus, it may be reasonably expected that the World Trade Organization (WTO) serves as the most important forum for issues in energy trading. This assumption is justified by the overall success of the WTO as an international organization: with 164 members it represents over 96.4% of global trade and 96.7% of global GDP (World Trade Organization, 2017) and features the best international dispute settlement mechanism (Meyer, Explaining Energy Disputes at the World Trade Organization, 2017, p. 392). Until recently, however, the international energy discussions have mostly bypassed the WTO. Several reasons are at cause for this paradox. In fact, both the General Agreement on Tariffs and Trade (GATT) and the General Agreement on Trade in Services (GATS) do not provide a comprehensive framework for energy regulation, nor does the WTO feature a sector-specific agreement similar to the ones foreseen for trade in agriculture and textiles. Furthermore, the most important fossil fuel-exporting countries, such as the members of OPEC and the Russian Federation, have not been involved in the founding process of GATT 1947. Considering also the fact that the regulation of the energy sector has traditionally always been jealously guarded by the countries, the WTO rules have, as a consequence, not been drafted with energy trade in mind.

Throughout the years, countries have, however, been trying to overcome the lack of specific rules on international trade in energy by negotiating regional agreements specifically dedicated to energy, the most important of which are the North American Free Trade Agreement (NAFTA) and the Energy Charter Treaty (ECT) (Meyer, 2016, p.

140). This has led part of the scholarly literature to believe that the general WTO rules do not automatically apply to energy and that trade in energy must be considered "a special case that was excluded *de facto*, not *de iure*, from the GATT/WTO disciplines" by a "Gentlemen's Agreement" (Leal-Arcas & Abu Gosh, 2014, p. 24), due to its special characteristics that distinguishes this trade sector from the other ones. Nonetheless, the majority of the scholars agree that WTO rules apply to all sectors of trade, including trade in energy, affirming that energy trade has never been explicitly excluded by the WTO agreements, that energy-related matters had repeatedly been discussed during GATT negotiation rounds and that energy and fossil fuels were important topics in the accession protocols of energy-endowed countries to the WTO (Marhold & Weiss, 2018). This opinion is further backed up by the recent accessions of Saudi Arabia (2005), Russia (2012) and Kazakhstan (2015), which are key players in global fossil fuel production, and the dramatically rising number of disputes concerning energy trade under the WTO DSU in the last decade. This appears to suggest that the parties do, indeed, consider trade in energy to be covered by the international trade regime. In fact, starting from 2009, energy disputes represent a frequent workload of the panels and can be divided in four different categories (Wüstenberg & Talus, 2018, p. 361):

(1) disputes on renewable energy subsidies, which are the most common;
(2) disputes on anti-dumping measures related to biofuels;
(3) disputes on anti-dumping measures related to energy-intensive goods produced by input dumping of energy;
(4) disputes on measures related directly to the energy market and energy security.

As the only panel report of the last category so far, the case *European Union and its member States – Certain Measures Relating to the Energy Sector* has been defined as an "important milestone in the history of the WTO" (Pogoretskyy & Talus, 2019, p. 1). Besides showing (once more) that the WTO allows for the cooperative settlement of politically highly sensitive disputes in an institutionalized context with clear rules and procedures, it is the first decision on the compatibility of the regulatory framework of a domestic energy market with international trade rules and, thus, addresses legal questions that have not yet been considered by WTO case law.

4.2.2. Russia's claims against the Third Energy Package

Russia raised several claims against different measures of the Third Energy Package asserting the infringement of multiple WTO rules[60]:

(1) the unbundling measure with regard to article II:1 of the GATS, and articles I:1 and III:4 of the GATT 1994;
(2) the LNG measure regarding article I:1 of the GATT 1994;
(3) the infrastructure exemption measure concerning articles I:1, X:3(a) and XI:1 of the GATT 1994, and article II:1 of the GATS;
(4) the upstream pipeline networks measure in respect of articles I:1 and III:4 of the GATT 1994;
(5) the third-country certification measure as regards articles II:1, VI:1, VI:5(a) and XVII of the GATS;
(6) the Trans-European Networks for Energy (TEN-E) measure in reference to articles I:1 and III:4 of the GATT 1994, and article II:1 of the GATS.

The Panel's findings rejected most of the claims, deciding in favour of Russia only with reference to the infrastructure exemption measure, the third-country certification measure and the TEN-E measure.

However, before examining the conformity of the challenged measures to the WTO framework, the Panel had to assess a more general question. Since Russia asserted several infringements of the GATS, it was a necessary premise to identify the energy services affected by the EU measures. In its request, Russia referred to "natural gas pipeline transport services" or "pipeline transport services" (WT/DS476/R, par. 7.252), holding that these services should be interpreted in a broad way as to comprise, but not be limited to, the transmission and supply of natural gas and LNG, including all related and associated services. In fact, Russia argued that the entire gas market could be

[60] Russia also challenged some measures contained in the implementing laws of the Third Energy Package of Croatia, Hungary and Lithuania, namely:
the unbundling measure in respect of articles XVI:2(a), XVI:2(e), and XVI:2(f) of the GATS;
the public body measure regarding article XVII of the GATS;
the third-country certification measure under article XVII of the GATS;
Of these only the last claim will be analysed, as the others do not raise relevant issues for the scope of this chapter.

considered a supply system, in which the supply of natural gas is not just a separate market segment but a service that overlaps with production, sale and transmission, given that natural gas is produced and transported for the purpose of supplying customers. The European Union, on the contrary, disagreed that the definition of pipeline transport services encompasses the supply of natural gas, supply services and/or LNG services. The Panel recalled that the supply of natural gas does not really consist in trade of a service, as required by the GATS[61], but in trade of a good and as such not covered by this agreement. As to the notion of "supply services", the panel held that Russia's excessively broad definition was too vague, making it impossible to ascertain exactly which services had to be considered for the panel's assessment. Furthermore, the principle of mutual exclusivity of sectors and sub-sectors for the interpretation of the GATS commitment schedules demands that "a given service cannot fall under two different sectors or subsectors at the same time" (par. 7.273). With regard to LNG services, the Panel observed that there is a complementarity between them and pipeline transport services. However, "a service concerning or enabling the supply of another service must not necessarily and automatically be that other service" (par. 7.282). Therefore, the services that were considered by the panel report only concerned the transportation of natural gas with transmission pipelines.

4.2.3. The Panel's findings: the unbundling measure

Starting with the unbundling measure, Russia did not challenge the unbundling requirement as such, but argued that permitting the member states to choose between different unbundling models for transmission systems that belonged to a vertically integrated undertaking (VIU) on 3 September 2009 results in a discrimination. Directive 2009/73/EC, in fact, foresees three different options for member states to effectively separate transmission from production and supply activities and to prevent in this manner conflicts of interests and cross-subsidization by VIUs:

(1) ownership unbundling (OU) model; the person or entity engaged in production

[61] Article I:1 of the GATS: "This Agreement applies to measures by Members affecting trade in services."

and supply of natural gas must be structurally separated from the person or entity engaged in the transmission of natural gas and the operation of the transmission system, with the consequence that VIUs must divest their control and rights over either the transmission systems and TSOs or the natural gas production and supply activities.

(2) independent System Operator (ISO) model; a VIU may own the transmission system, but a separated system operator that complies with OU requirements is designated by the member state and approved by the Commission (art. 9, par. 8 and 14 Directive 2009/73/EC).

(3) independent Transmission Operator (ITO) model; the owner of the transmission system and the TSO belong to the same VIU, but independence of the latter is guaranteed by structural and organizational requirements (art. 9, par. 8 and 17 ff. Directive 2003/67/EC).

Moreover, according to article 9, par. 9 of Directive 2003/67/EC, ownership unbundling is not required if the transmission system is owned by a VIU, but already existing national provisions guarantee a more effective independence of the TSO than the ITO model[62].

According to Russia, allowing the member states to choose which model to implement in respect of transmission systems that belonged to a VIU on 3 September 2009 resulted in a *de facto* violation of article II:1 of the GATS. This provision spells out the so-called Most-Favoured Nation (MFN) principle according to which "each Member shall accord immediately and unconditionally to services and service suppliers of any other Member treatment no less favourable than that it accords to like services and service suppliers of any other country". The implementation of the OU model, Russia argued, accords less favourable treatment of Russian pipeline transport service suppliers when compared to the treatment of pipeline transport service suppliers of other non-EU countries which supply their services in EU member states that have implemented the other models. In order to determine whether the MFN principle had been violated, Russia had to show that (a) the unbundling measure falls within the scope of the GATS, (b) the relevant services and service suppliers are like and (c) that the unbundling measure in the

[62] This option is also referred to as "ITO+ model" (Oyewunmi, 2018, footnote 572).

Directive accords less favourable treatment to Russian services and service suppliers than that accorded to like services and service suppliers of any other country. Although the Panel acknowledged that the first two elements were established, it found that Russia failed to provide the third requirement. In fact, although the Panel concluded that "pipeline transport services and service suppliers are accorded less favourable treatment under the OU model in comparison with the ITO model" (WT/DS476/R, par. 7.473), it did not detect a *de facto* less favourable treatment accorded to Russian pipeline transport services vis-à-vis service suppliers of any other non-EU member state. Even though the latter were able to continue supplying pipeline transport services in member states that implemented the ITO model while Gazprom had to divest its assets in member states with OU model, the argumentation of Russia was at fault for neglecting that the same was true vice versa. As a matter of fact, according to the Panel's opinion the actual reason why the unbundling measure may have had a greater impact on Gazprom than on service suppliers from other non-EU countries was not the design, structure and expected operation of the unbundling measure in the Directive, but the "factual particularities of the EU market" in which "Russian pipeline transport service suppliers had a greater commercial presence than those of other non-EU countries, when the Directive entered into force on 3 September 2009" (par. 7.510).

Russia also failed to demonstrate that the unbundling measure grants less favourable treatment to imported Russian natural gas than that accorded to domestic EU natural gas under article III:4[63] of the GATT. Article III of the GATT establishes the so-called National Treatment (NT) clause which prohibits discrimination between imported and domestically produced goods in relation to national taxation or other government regulation. The Panel assessed that there is no less favourable treatment under the OU model in comparison with the treatment accorded to natural gas under the other models, considering that, *inter alia*, "the rules on third-party access and capacity allocation render it "illegal" for an ITO, which belongs to a VIU under the ITO model, to

[63] Article III:4 of the GATT: "The products of the territory of any contracting party imported into the territory of any other contracting party shall be accorded treatment no less favourable than that accorded to like products of national origin in respect of all laws, regulations and requirements affecting their internal sale, offering for sale, purchase, transportation, distribution or use. […]"

favour the natural gas of that VIU" (par. 7.548). Therefore, the sale of natural gas under the ITO model does not occur on more favourable competitive terms.

Russia's claim under article I:1 of the GATT involved, as well, an assessment on whether the unbundling measure modified the conditions of competition in the gas market to the detriment of imported Russian natural gas and to the advantage of domestically produced gas. However, the assertion lacked any relevant evidence, as Russia limited itself to "compare the treatment of imported Russian gas with that of imported natural gas from any other non-EU country, rather than domestic EU natural gas" (par. 7.580).

Thus, the unbundling measure of the Third Energy Package was not inconsistent with WTO law.

4.2.4. The Panel's findings: the LNG measure

The LNG measure consists in an exemption from the unbundling requirements. In fact, it provides that LNG system operators[64] are not requested to fulfil the unbundling requirements foreseen for TSOs. Russia challenged the measure under article I:1 of the GATT, claiming that in this manner LNG imported into the EU via LNG facilities gains an advantage that is not accorded to Russian national gas imported via pipelines. The advantage would consist in the reduction of costs and the possibility to create more competitive opportunities for the sale, purchase and transportation of natural gas on the EU market. Article I:1[65] of the GATT is the equivalent provision to article III:4 of the GATS, establishing the MFN principle for the trade in goods.

The analysis of the Panel on this measure boiled down to the fundamental question on whether imported Russian natural gas and LNG imported from other countries can be

[64] The responsibilities of LNG system operators include the operation and management of an LNG facility and the carrying out of importation, offloading and regasification of LNG.

[65] Article I:1 of the GATT: "With respect to customs duties and charges of any kind imposed on or in connection with importation or exportation or imposed on the international transfer of payments for imports or exports, and with respect to the method of levying such duties and charges, and with respect to all rules and formalities in connection with importation and exportation, and with respect to all matters referred to in paragraphs 2 and 4 of Article III, any advantage, favour, privilege or immunity granted by any contracting party to any product originating in or destined for any other country shall be accorded immediately and unconditionally to the like product originating in or destined for the territories of all other contracting parties."

considered “like products” pursuant to article I:1 of the GATT. In fact, a different treatment of imported products is prohibited only if the relevant products are “like”. To solve the legal question, the Panel employed the likeness test as traditionally applied by the Appellate Body in article III:4 of the GATT. This test requires to consider several criteria on a case-by-case basis for assessing the likeness between products in their competitive relationship:

(1) the properties, nature and quality of the products;

(2) the end-uses of the products;

(3) consumers' tastes and habits in respect of the products;

(4) the tariff classification of the products.

As to the first criterion, the Panel observed that “LNG is liquid while natural gas is gaseous” (par. 7.847). Even though regasified LNG has identical end-uses to pipeline gas, LNG before regasification may have other end-uses such as a transport fuel, and consumer preferences (for ex. storage). Furthermore, the classification of LNG and pipeline gas is different under the World Customs Organization Harmonized Commodity Description and Coding System, which is used in the GATT tariff commitments by the WTO parties. Thus, Russia’s claim failed to pass the likeness test and was rejected by the Panel.

The assessment of the Panel appears to be rather simplistic (Pogoretskyy & Talus, 2019). It neglects, for example, that both LNG and pipeline gas are fluids with the same molecular structure. Furthermore, LNG is always regasified before consumption and its use as a transport fuel is currently of negligible significance. At the same time, the Panel may have been sensitive to the on-going evolution of the gas market, taking into account the ongoing development of an international LNG market that can be regulated differently than the traditional pipeline gas market under WTO rules.

4.2.5. The Panel’s findings: the infrastructure exemption measure

Article 36 of Directive 2009/67/EC[66] provides an exemption for major new gas

[66] See also chapter 2, section 2.3.

infrastructure (interconnectors, LNG and storage facilities) and projects that significantly increase capacity of existing infrastructure or modify such infrastructure if they allow the deployment of new sources of gas supply. The exemption covers key provisions of the Directive, such as the unbundling rules, third-party access requirements to transmission and distribution systems, rules on storage facilities and upstream pipeline networks, and rules on terms, conditions, tariffs and methodologies for the access of the latter. However, these provisions cease to apply only if certain conditions are fulfilled:

(1) competition in gas supply and security of supply are enhanced;
(2) the exemption is necessary to obtain the needed investment;
(3) the owner of the infrastructure has to be legally separated from the system operators in whose systems that infrastructure will be built;
(4) users of the infrastructure must bear the charges;
(5) the competition in the relevant markets which are likely to be affected, the effective functioning of the internal market in natural gas or of the concerned regulated system or the security of gas supply are not negatively affected by the exemption.

The relevant national regulatory authority (NRA) decides whether the exemption is granted and notifies the Commission, which can ask to withdraw or amend the NRA's decision. The NRA can also impose, case-by-case, conditions in respect of the scope and duration of the exemption and non-discriminatory access to the infrastructure.

Russia challenged the infrastructure exemption measure under four different WTO rules. The first one, article X:3(a) of the GATT[67], requires that WTO members administer their trade regulations in a uniform, impartial and reasonable manner. Russia argued, in fact, that the Commission had shown inconsistencies with its own internal guidelines and decisions when applying the different criteria and did not review its decisions even though changing circumstances demanded that. However, the panel rejected the claim, highlighting that Russia's argumentation involved the substantive content of the criteria and the assessment of the merits rather than the administration of the exemption.

[67] Article X:3(a) of the GATT: "Each contracting party shall administer in a uniform, impartial and reasonable manner all its laws, regulations, decisions and rulings of the kind described in paragraph 1 of this Article."

Moreover, the Panel showed self-restraint in reviewing the consistency of EU decisions with its domestic law or practice, as this task does not represent an intended function of the WTO dispute settlement mechanism and would go beyond the scope of the ruling.

The next WTO rules invoked by Russia are article II:1 of the GATS and article I:1 of the GATT. According to Russia, the implementation of article 36 of Directive 2009/67/EC was inconsistent and discriminatory, which negatively affected the supply of pipeline transport services and natural gas, thus violating the MFN principles of the GATS and the GATT. However, the Panel found that "the differences identified by Russia […] in each of the individual situations concerned do stem from the Commission's assessment of the specific circumstances, distinct geographical situations and competitive impacts of the different pipelines concerned" (par. 7.962).

Lastly, Russia asserted a violation of article XI:1 of the GATT[68] on, *inter alia*, prohibitions and restrictions that limit the quantity or amount when importing a product. In detail, the object of the claim was the 2009 OPAL infrastructure exemption decision[69]. The Ostseepipeline-Anbindungsleitung (OPAL) gas pipeline is an inland transmission route to the west of the Nord Stream 1 offshore pipeline and delivers Russian gas to the German/Czech border. This infrastructure asset has a strong political connotation, considering that in this manner Russia does not have to rely on Ukrainian and Belarus transport routes to deliver natural gas to Western Europe (fig. 4). The infrastructure exemption decision on OPAL imposed conditions which, according to Russia, determined *de facto* a quantitative restriction on the volume of imported Russian gas by limiting "Gazprom's ability and incentive to import Nord Stream gas for OPAL transport, which has the same effect as banning a certain volume of imports directly" (par. 7.977). In fact, it was required that 50% of the exit capacity of the pipeline had to be annually allocated on one of the Czech gas markets (so-called capacity cap), unless 3 billion m³/year were

[68] Article XI:1 of the GATT: "No prohibitions or restrictions other than duties, taxes or other charges, whether made effective through quotas, import or export licences or other measures, shall be instituted or maintained by any contracting party on the importation of any product of the territory of any other contracting party or on the exportation or sale for export of any product destined for the territory of any other contracting party."

[69] Commission Decision of 12 June 2009 on the exemption of the OPAL pipeline from the requirements on third party access and tariff regulation laid down in Articles 18, 25(2), 25(3) and 25(4) of Directive 2003/55/EC, C(2009) 4694.

Figure 4: The OPAL pipeline delivers Russian natural gas from the north to the south, with the entry point at German Greifswald and the exit point at Brandov in Czechia.

Source: ENTSOG, 2017b.

offered in an open, transparent and non-discriminatory way (so-called gas release programme). The Panel ascertained that the measure at issue cannot be considered a simple internal regulatory measure that is not administered at the border, as such outside of the scope of article XI:1 of the GATT, but a measure effectively affecting the importation of Russian gas given the "fixed nature of pipeline infrastructure and the necessity for natural gas transported by pipeline to flow along predetermined paths and to be imported through a limited number of fixed entry points" (par. 7.994). The Panel

also acknowledged other facts:

(1) 100% of the natural gas transported via OPAL is of Russian origin;
(2) Gazprom is the only undertaking affected by the capacity cap;
(3) Gazprom is the only importer of natural gas via the Nord Stream 1 pipeline;
(4) no other undertaking has tried to use the vacant capacity of the OPAL pipeline;
(5) the natural gas transported through Nord Stream 1 and OPAL is exclusively of Russian origin;
(6) OPAL is transporting only half of the amount of Russian gas that it has the capacity to transport.

It is furthermore irrelevant that there exist other possibilities for Russian natural gas to be imported in Western Europe, such as the NEL, Brotherhood and Yamal pipelines. In fact, "Russian natural gas imported via other pipelines goes to other EU destinations and cannot be substituted for natural gas that could have been transported through the additional capacity on the OPAL pipeline" (par. 7.999, footnote 1639), the consequence of which is a limit in competitive opportunities that is prohibited by article XI:1 of the GATT. Therefore, the Panel recognizes that the measure at issue is discouraging and disincentivizing importation of natural gas through the Nord Stream and OPAL pipelines and as such not in line with the WTO legal regime.

4.2.6. The Panel's findings: the upstream pipeline networks measure

Directive 2009/67/EC does not apply the rules on unbundling, third-party access *ex* article 32 and tariff regulation to upstream pipeline networks, since they are excluded from the definition of "transmission"[70]. Article 34 provides a separate legal regime on access to these networks, which does not require third-party access to upstream pipeline networks if they are used for local production at the production site of natural gas.

Russia raised two claims against this measure. The first one consisted in the assertion

[70] Article 2, n. 3 of Directive 2009/67/EC: "'transmission' means the transport of natural gas through a network, which mainly contains high-pressure pipelines, *other than an upstream pipeline network* [italics added] and other than the part of high-pressure pipelines primarily used in the context of local distribution of natural gas, with a view to its delivery to customers, but not including supply;"

that natural gas provided by other non-member countries via upstream pipelines obtains an advantage that is not granted to Russian natural gas delivered by transmission lines, thus violating article I:1 and article III:4 of the GATT. Having concluded that "imported natural gas of Russian origin transported via transmission pipelines and imported natural gas originating in any other third country transported via upstream pipelines are like products" (par. 7.1022), the legal question at issue was whether the application of a special legal regime to upstream pipeline networks grants more favourable competitive opportunities to imported natural gas from third countries via such networks over imported Russian gas via transmission pipelines. Russia argued, in particular, that "a VIU transporting natural gas via upstream pipelines whose operators it controls would be in a better position than a VIU transporting natural gas via transmission pipelines whose operators it does not control" (par. 7.1027) and that the operators of upstream pipeline networks are not required to ensure access to third parties. However, in relation to the first argument, the Panel highlighted that Russia did not explain how the alleged better position of the VIU translates into a competitive advantage. As to the second argument, the Panel observed that although the article 34 on access to upstream pipeline networks is different from article 32 on access to transmission pipelines, there is nevertheless an obligation on third-party access. Thus, it could not be reasonably claimed that the operators are exempted. Consequently, Russia was not able to demonstrate a violation of article I:1 of the GATT.

The second claim was raised under article I:1 of the GATT as well. Russia argued that the rejection of exemptions from third-party access and tariff regulation rules for the operator of the NEL pipeline and the imposition of conditions on the exemption for the operator of the OPAL pipeline showed how the alleged "automatic exemption" for operators of upstream pipeline networks were at a competitive advantage. However, it did not provide any new explanation in what this advantage consisted. Therefore, the Panel rejected the claim.

4.2.7. The Panel's findings: the third-country certification measure

Article 11 of Directive 2009/67/EC provides a special regime for the certification of transmission systems and TSOs which are controlled by an entity from a third country or third countries. The most important difference is that the Commission issues an opinion on whether the entity complies with the unbundling requirements and on whether the certification will put at risk the security of energy supply to the EU, taking into account the specific facts of the case and the relevant third country, as well as the rights and obligations of applicable international law between the EU and the third country.

Russia challenged this measure firstly under the MFN principle *ex* article II:2 of the GATS, claiming that there is a *de facto* less favourable treatment of Russian pipeline transport service suppliers compared to pipeline transport service suppliers of other non-EU countries, due to the fact that the certification procedure for the former involves a security of supply assessment. However, the examples brought forth by the claimant were not sufficient to demonstrate an infringement of article II:2 of the GATS. "On the contrary, these examples appear to demonstrate that pipeline transport service suppliers from other origins than Russian are [also] subject to third-country certification under Article 11 of the Directive, including a security of energy supply." (par. 7.1110).

Secondly, Russia invoked article XVII of the GATS with respect to the implementing laws of Croatia, Hungary and Lithuania[71] of the measure at issue, due to the fact that the difference in the certification procedure violates the National Treatment principle by granting Russian pipeline transport service suppliers less favourable treatment compared to domestic transmission service suppliers. The Panel did indeed highlight that the latter are not subject to the security of supply assessment. Considering moreover the fact that only TSOs can supply pipeline transport services in the EU, the security of supply assessment complicates taking control or ownership of a TSO for third-country pipeline transport service suppliers, which consequently translates into a change of competitive conditions in favour of domestic service suppliers. The European Union did not contest that there was an infringement of the GATS, but claimed that it

[71] This was possible due to the specific national treatment commitments regarding pipeline transport services in the GATS schedules undertaken by these EU member states.

was justified under article XIV(a) of the GATS. Article XIV of the GATS lists the general exceptions to the obligations contained in the GATS and allows the parties, at the letter a, to adopt or enforce measures that are "necessary to protect public morals or to maintain public order". In footnote 5, the GATS also provides an authentic interpretation of this exception clause, declaring that it "may be invoked only where a genuine and sufficiently serious threat is posed to one of the fundamental interests of society". The EU based its defence subsequently on the following considerations:

(1) the disruption of energy supply can have severe consequences for the society, the economy and politics; for that reason, security of energy supply as classically defined is a fundamental interest of society within the meaning of footnote 5 to Article XIV(a) of the GATS.

(2) the foreign control of TSOs poses a genuine and sufficiently serious threat to the security of energy supply in the EU in a series of situations; in fact, foreign governments have conflicting interests with the EU and may effectively undermine the EU's security of supply via controlled TSOs. Furthermore, the EU recognizes difficulties in detecting and investigating violations of obligations and the enforcement of sanctions with respect to foreign controlled TSOs.

(3) the third-country certification measure is designed to ensure the EU's security of energy supply, as it is "specifically aimed at ensuring the security of gas supply in the European Union by addressing the threats […] posed by foreign controlled TSOs" (par. 7.1205);

(4) the screening mechanism contained in the challenged measure allows to detect and assess *ex ante* the potential threats and allows to effectively prevent them by denying access to the transmission market; the measure is therefore "manifestly apt" (par. 7.1214) to ensure the security of supply.

(5) the trade-restrictiveness of the third-country certification measure is limited; in fact, it is less restrictive than a complete ban and restrictions are imposed only on a case-by-case basis.

(6) the available alternative measures proposed by Russia cannot reasonably dispel the necessity of the measure at issue.

The Panel agreed with the European Union in all of these passages. However, it found that the measure at issue is inconsistent with the requirements of the chapeau[72] of article XIV of the GATS. In its findings, it emphasised in particular that the reasoning according to which foreign controlled TSOs might be subject to legal obligations and inducements by third countries that conflict with the EU's interests is also applicable to domestic TSOs, insofar they conduct similar or related economic activities in a non-EU country. In the words of the Panel, "while the risk or threat to the European Union's security of energy supply posed by domestically controlled TSOs may be different or less than that posed by foreign controlled TSOs, the European Union has not demonstrated that this risk or threat does not exist, nor that it is entirely speculative or hypothetical" (par. 7.1251). In fact, the rationale of the measure requires that there must also be an "assessment of threats posed by foreign governments requiring or inducing domestically controlled TSOs to undermine the European Union's security of energy supply" (par. 7.1253). As a consequence, the third-country measure was deemed to be an arbitrary and unjustified discrimination which could not be covered by the general exceptions in article XIV of the GATS.

Given that the Panel ascertained the violation of article XVII GATS, it refrained from examining the remaining claims of the same measure under articles VI:1 and VI:5(a) of the GATS according to the principle of judicial economy.

4.2.8. The Panel's findings: the TEN-E measure

The last contested measure is not contained in Directive 2009/67/EC, but in Regulation (EU) No 347/2013 of the European Parliament and of the Council of 17 April 2013 on guidelines for trans-European energy infrastructure. The Regulation provides guidelines for the "timely development and interoperability of priority corridors and areas of trans-European energy infrastructure" (art. 1) and sets out the criteria for the designation of projects of common interest (PCIs). An infrastructure project has to respect a set of

[72] Chapeau of article XIV of the GATS: "Subject to the requirement that such measures are not applied in a manner which would constitute a means of arbitrary or unjustifiable discrimination between countries where like conditions prevail, or a disguised restriction on trade in services […]."

different criteria in order to be designated as PCI as provided by article 4, par. 1 of the Regulation. But more importantly, energy infrastructure projects concerning gas must satisfy additional criteria set out in article 4, par. 2(b). In detail, they must "contribute significantly to at least one of the following specific criteria:

(1) market integration, inter alia through lifting the isolation of at least one Member State and reducing energy infrastructure bottlenecks; interoperability and system flexibility;

(2) security of supply, inter alia through appropriate connections and diversification of supply sources, supplying counterparts and routes;

(3) competition, *inter alia through diversification of supply sources* [italics added], supplying counterparts and routes;

(4) sustainability, inter alia through reducing emissions, supporting intermittent renewable generation and enhancing deployment of renewable gas".

Russia challenged the measure under articles I:1 (MFN principle) and III:4 (NT principle) of the GATT due to the fact that the criteria used to designate PCIs are discriminating Russian natural gas. In Russia's opinion, by pursuing a diversification of gas supply the measure is designed to reduce the supply and transmission of imported Russian gas within the EU and to ultimately reduce its competitive opportunities compared to domestic natural gas and imported natural gas from other third countries.

The Panel started its analysis by examining the definition of the single priority gas corridors and concluded that the meaning of "diversification of supply sources" embodies the development of infrastructure aimed at connecting sources of natural gas supply other than Russia, with the consequence that only those infrastructure projects that are going to deliver non-Russian gas would be eligible to be designated as PCIs.

Continuing with Russia's claim under the National Treatment principle of the GATT, the Panel observed that the Regulation provides specific incentives of administrative, regulatory and financial nature to PCIs, with the consequence that the completion of such projects is faster and less expensive compared to other projects. Thus, projects that do not contribute to the diversification of gas supply, i.e. the development of infrastructure for the import of Russian gas, will not receive any of the aforementioned

benefits. These considerations sufficed for the panel to declare an infringement of article III:4 of the GATT.

As to the alleged inconsistency of the measure at issue with article I:1 of the GATT, the Panel decided in the same manner. Even though the EU pointed out that the TEN-E measure "contributes […] to achieving greater equality of competitive opportunities for natural gas from all potential sources, including Russia" (WT/DS476/R, par. 7.1302), the Panel rejected this defence for the same reasons as above. Given the fact that the measure is "designed to increase the availability of new projects developing pipeline infrastructure to transport natural gas of non-Russian origin and decrease the availability of new projects developing pipeline infrastructure to transport natural gas of Russian origin" (par. 7.1312), it does not provide immediately and unconditionally the same advantages to Russian natural gas as requested by article I:1 of the GATT.

The EU furthermore defended the TEN-E measure on the basis of the general exception contained in article XX(j) of the GATT, according to which the WTO parties may adopt and enforce measures that are "essential to the acquisition or distribution of products in general or local short supply". However, the Panel did not agree with the EU's argument that the existence of genuine and serious risks of a gas supply disruption represents a situation of "short supply" within the meaning of the exception. In fact, the wording of the provision requires that the supply of the product is at risk in the present and does not cover the eventuality that said product may be hypothetically of short supply in the future. Thus, the Panel rejected the EU's defence under article XX(j) of the GATT.

The last claim against the TEN-E measure was based on article II:1 of the GATS and the argument that "the criteria for PCI designation under the TEN-E measure are inherently biased against Russian services and service suppliers" (par. 7.1383) in favour of services and service suppliers of any other WTO member. However, Russia failed to show a necessary connection between the infrastructure projects and Russian pipeline transport service suppliers. In fact, the panel observed that "a project to develop infrastructure precedes the use of such infrastructure, and therefore does not itself involve the supply of pipeline transport" (par. 7.1426). Hence, it could not ascertain a

discrimination in the origin of project promoters in the TEN-E measure. Therefore, the National Treatment principle of the GATS was not infringed.

4.2.9. Impacts of the WTO ruling and final remarks

Both the European Union and Russia partially appealed the panel report on 21 September 2018 (WT/DS476/6) and on 26 September 2018 (WT/DS476/7), respectively. However, given the current blockade of the (re-)appointment of the members of the Appellate Body caused by the USA and the backload of pending appeals (Bloomberg L.P., 2019), it is highly uncertain when the appeal will be heard and decided[73]. The appeals, though, do not cover all the parts of the report that have been decided to the detriment of one of the parties, potentially allowing for a quicker ruling on the matter. Especially Russia limited its request for review considerably and asked the Appellate Body to decide only on the Panel's decision in regard to:

(1) the unbundling measure under article II:1 of the GATS;
(2) the public body measure under article XVII:1 of the GATS;
(3) the LNG measure under article I:1 of the GATT 1994; and
(4) the upstream pipeline networks measure under articles I:1 and III:4 of the GATT 1994.

Ad interim, the panel report already allows for some interesting considerations on the controversy. Firstly, the WTO framework seems to leave ample space for the EU to freely develop its energy market, as many of the key provisions contained in the Third Energy Package – such as the unbundling requirements, the LNG treatment and the TSO provisions – seem unlikely to be inconsistent with international trade rules. In fact, the Panel ascertained problems only in relation to very specific provisions that confer

[73] The Communication from the Appellate Body from 20 November 2018 (WT/DS476/8) addressed this issue as follows: "[…] The Appellate Body is also not able to circulate its report within the 90-day timeframe provided for in the last sentence of Article 17.5 of the DSU. In this respect, we refer to the size of the Panel record and the complex issues appealed. We further note that in view of the backlog of appeals pending with the Appellate Body at present, the overlap in the composition of all divisions resulting in part from the reduced number of Appellate Body Members, together with the shortage of staff in the Appellate Body Secretariat, Division Members can currently spend only very little time preparing for this appeal. It will not be possible for the Division to focus on the consideration of this appeal and for it to be fully staffed for some time."

benefits to either the management of transmission lines (infrastructure exemption measure) or the development of new infrastructure (third-country certification measure and TEN-E measure).

However, if the Appellate Body were to uphold the panel report in the parts that declared the infringement upon WTO rules, the implementation of the ruling by the EU would have important consequences for the EU energy security, especially under the aspect of diversification of supply. As regards the certification of TSOs, an energy security assessment would have to be introduced also for domestic TSOs, which would represent an additional regulatory burden for the authorities. However, said assessment could be less intense than the one foreseen for TSOs that are controlled by foreign countries, considering that the Panel recognized the different nature and likeliness of the threats. In this manner, the ruling could actually contribute to strengthen energy security from within, as it would further minimize the risk that domestic TSOs act against the EU's interests.

In respect of the TEN-E measure, the EU would have to change its regulation so that the criteria for the PCI designation cannot exclude projects that will deliver Russian gas. This is certainly the most problematic aspect, as it would, instead of contributing to the objective of diversification of gas supply, undermine diversification efforts and potentially even increase dependency on Russia. The EU would need to find WTO-compatible ways to foster the development of new infrastructure that connects other sources, which is easier said than done. In fact, any benefit accorded to the importation of natural gas from other third countries that results in a limitation of competitive opportunities for Russia seems likely to infringe upon WTO rules. In such a context, the diversification of supply routes in the EU will be significantly hampered and will proceed more slowly. A bigger focus on LNG and associated infrastructure could represent a possible solution for this dilemma, given the Panel's conclusion that LNG is not like natural gas within the meaning of the MFN-principle. In fact, by increasing the LNG capacities and establishing continuous and reliable maritime trade routes, a considerable amount of Russia natural gas could eventually be replaced by LNG imports in the future.

Table 5: Overview of the Panel's findings

Challenged measure	Criterion of assessment	Inconsistency	
		Yes	No
Unbundling measure	Article II:1 of the GATS	☐	☒
	Article I:1 of the GATT	☐	☒
	Article III:4 of the GATT	☐	☒
LNG measure	Article I:1 of the GATT	☐	☒
Infrastructure exemption measure (in particular, the OPAL exemption decision)	Article X:3(a) of the GATT	☐	☒
	Article II:1 of the GATS and article I:1 of the GATT	☐	☒
	Article XI:1 of the GATT	☒	☐
Upstream pipeline networks measure	Article I:1 of the GATT	☐	☒
	Article III:4 of the GATT	☐	☒
Third-country certification measure	Article II:1 of the GATS	☐	☒
	Article XVII of the GATS	☒	☐
TEN-E measure	Article I:1 of the GATT	☒	☐
	Article III:4 of the GATT	☒	☐
	Article II:1 of the GATS	☐	☒

The OPAL decision, on the contrary, has already been reviewed during the WTO proceedings by the Commission[74], following a settlement agreement between Gazprom and the German regulatory authority. The new decision kept the exempted capacity cap of 50%, but provided that only 20% of the pipeline capacity must be auctioned, if there was sufficient demand, to third parties. The remaining 30% of capacity were auctioned without any conditions, allowing Gazprom to effectively reserve a total of 80% of the OPAL capacity. However, a total of three actions of annulment have been advanced at the General Court of the European Union against the 2016 OPAL exemption decision.

[74] Commission Decision of 28 October 2016 on review of the exemption of the Ostseepipeline-Anbindungsleitung from the requirements on third party access and tariff regulation granted under Directive 2003/55/EC, C(2016) 6950 final.

Interestingly, the claims were brought to the attention of the Court by Polish entities. In the cases T-130/17 and T-849/16, the Polish energy company Polskie Górnictwo Naftowe i Gazownictwo SA (PGNiG) and its German-based subsidiary PGNiG Supply & Trading GmbH asked the General Court to annul the new OPAL decision. However, both cases were declared inadmissible, as the claimants failed to satisfy the standing requirements laid out in article 263 TFEU. In fact, the Court ruled that the decision was not of direct and individual concern to them, nor a regulatory act of direct concern to them that did not entail implementing measures. The third case T-883/16, however, was promoted by the Republic of Poland and led to the annulment of the decision for the violation of the principle of energy solidarity. The judgement of 10 September 2019 marks an important milestone for European energy security, as it is the first time that a legal act of the European Union was declared void for the breach of the energy solidarity principle contained in article 194 TFEU, thus providing important information on the future interpretation and application of the principle. The Republic of Poland, which was supported by Latvia and Lithuania, claimed, *inter alia*, that the 2016 exemption decision threatened the security of gas supply in the EU, especially in the Central European region. More specifically, it argued that by allowing Gazprom to redirect additional volumes of gas onto the EU market and by the resulting limitation of gas transmission via the Yamal and Brotherhood pipelines its energy security would be considerably weakened and its efforts in diversifying its gas supply sources significantly undermined. Thus, Poland supposed a violation of article 36, par. 1(a) of Directive 2009/73/EC in connection with article 194, par. 1(b) TFEU. The Court, at first, rejected the alleged violation of article 36, par. 1(a) of Directive 2009/73/EC, considering that the 2016 exemption decision did not newly grant the exemption but only consisted in a review of the already existing exemption, which had already been established by the preceding 2009 OPAL decision. Therefore, it was not mandatory for the Commission to consider that the exemption must enhance security of supply. However, the General Court observed that the Commission failed to examine and consider the impacts and consequences of the decision on the member states' interests in the energy sector, especially in relation to their security of supply. In fact, according to the Court, the

principle of energy solidarity goes beyond emergency situations and mutual assistance duties, requiring every actor to avoid adopting measures that affect the interests of the EU and other Member States in relation to security of supply, its economic and political viability and the diversification of supply, taking also into account their interdependence and *de facto* solidarity. Thus, the 2016 OPAL decision violated article 194, par. 1(b) TFEU. The judgment is immediately applicable and, as a consequence, the conditions of the 2009 OPAL decision are reinstated. Thus, Gazprom can no longer bid for additional capacity and the network operator is "no longer allowed […] to transport gas volumes through these capacities which are already booked" (OPAL Gastransport GmbH & Co. KG, 2019). If the Commission chooses to appeal the judgement, it will be interesting to see whether it will introduce the WTO panel report in its argumentation as *ius superveniens* and, if so, how the ECJ will approach this multi-level judicial conflict. Based on past rulings, however, it is unlikely that the Court of Justice will reverse the General Court's decision on the grounds of the WTO panel report. In fact, panel reports are considered by the Court in the same manner as the substantive WTO rules for the purpose of reviewing the legality of EU acts (Zang, 2017). Consequently, "it is only where the Community intended to implement a particular obligation assumed in the context of the GATT/WTO, or where the Community measure refers expressly to the precise provisions of the GATT/WTO agreements, that it is for the Court to review the legality of the Community measure in question in the light of the WTO rules" (*Portugal v. Council,* C-149/96, par. 49). As Zang (2017) notes, "unfavourable WTO rulings do not include any special obligations" and "the legal effect of WTO rulings is inextricably linked to the effect of the WTO rules under dispute" (p. 279). The WTO ruling on the OPAL decision will therefore most likely only play a minor role in a potential appeal to the Court of Justice.

Another remark on the report that can be made concerns the difficulties that Russia was experiencing in its argumentation. Throughout the report, the Panel remarked multiple times that the claims against the challenged measures were not clear or inconsistent[75]. Moreover, Russia sometimes failed to establish the correct comparisons to demonstrate

[75] See, for example, WT/DS476/R, par. 7.13, 7.381, 7.412, 7.506, 7.738, 7.968, 7.1070.

a violation[76] or remained at a too general level in its argumentation. Particularly striking in this regard was the request directed at the Panel to undertake a "simple internet search" that would "quickly" prove the truthfulness of Russia's claims (par. 7.479). These observations can only be explained by the recent membership of Russia at the WTO. Considering that the dispute was initiated only two years after the accession of Russia to the WTO in 2012, it is (or was) most likely not yet entirely familiar with the complexity and the legal canons requested by the panels to demonstrate *prima facie* violations and inconsistencies with WTO rules. In fact, it can be reasonably excluded that Russia approached the dispute light-heartedly, considering that such undertakings involve a substantial economic cost that would not be voluntarily borne if chances of "winning" were regarded to be low. On the contrary, the WTO dispute settlement features a legal tradition of almost 25 years and over 500 disputes that requires time to carefully analyse and grow accustomed to. It is without a doubt, though, that this inexperience might have undermined the outcome of the dispute for Russia. It can, indeed, be supposed that a more solid argumentative apparatus may have conferred more strength to its claims, potentially even reversing some of the Panel's findings. Furthermore, the argumentation provided in this manner may remain a burden also in the upcoming appeal. In fact, even though "new arguments are not per se excluded from the scope of appellate review, simply because they are new", they are outside of the Appellate Body's terms of reference if they "solicit, receive and review new facts that were not before the Panel, and were not considered by it" (*Canada – Aircraft*, WT/DS70/AB/R, par. 211), in compliance with the general principle according to which the panels are the trier of facts and appeals limited to legal questions.

Thirdly, the Panel showed some inconsistencies in its assessments. While some claims were analysed to the full detail and considered in the context of the unique characteristics of gas infrastructure[77], other times it showed less accuracy or a particular deference. It has already been mentioned in section 4.2.4 how the Panel failed to meet a proper scientific standard for its comparison of physical properties between natural

[76] See, for example, WT/DS476/R, par. 7.484-7.509, par. 7.580.

[77] For ex. in respect of the unbundling measure and the infrastructure exemption measure.

gas and LNG. Furthermore, while the Panel upheld Russia's claim against the OPAL decision for "the particular facts and circumstances of this case, and the particularities of natural gas pipeline transport" (WT/DS476/R, par. 7.1002), it did not confer any relevance to such circumstances and particularities when assessing the third-country certification measure. In fact, "the Panel did not examine sufficiently the content of the measure, i.e. […] the specific criteria on the basis of which the screening is conducted by the EU Commission and the relevant NRAs" (Pogoretskyy & Talus, 2019, p. 16), while traditionally other Panels have been way more strict in examining the aptitude of the challenged measure to reach its stated objective and the degree of its trade-restrictiveness.

Lastly, the Panel's assessment on the TEN-E measure raises a systemic issue which was not entirely addressed by the report (Pogoretskyy & Talus, 2019). It relates specifically to network-bound trade that is based on insufficiently developed infrastructure and to the question on whether a measure can still be considered to negatively affect competitive opportunities of a WTO member if it aims to remove existing inequality of competition caused by objective factors such as the lack of fixed infrastructure. While in its assessment on the unbundling measure the Panel acknowledged the "factual particularities of the EU market" that conferred Russian pipeline transport service "a greater commercial presence" (par. 7.510), it completely neglected this aspect in the context of the TEN-E measure. The development of new gas infrastructure involves, in fact, high investments and a lot of time, even more so if no incentives are accorded. As Pogoretskyy & Talus (2019) highlight, "[t]he lack of adequate energy interconnectors in the EU led to a situation in which, in 2013, Russia was a single or predominant gas supplier in many of its Member States […]. In these circumstances, one can hardly argue that, at the time of the adoption of the TEN-E measure, there was a completed gas market at an EU-wide level with the effective gas-to-gas competition, where consumers could choose freely between different sources of gas supply" (pp. 17-18). Consequently, considering that there was *de facto* no competition for Russia in its role as a monopolist in the majority of the EU, that Russia already disposed of almost all the existing infrastructure to deliver gas to the EU and that the incentivized construction of

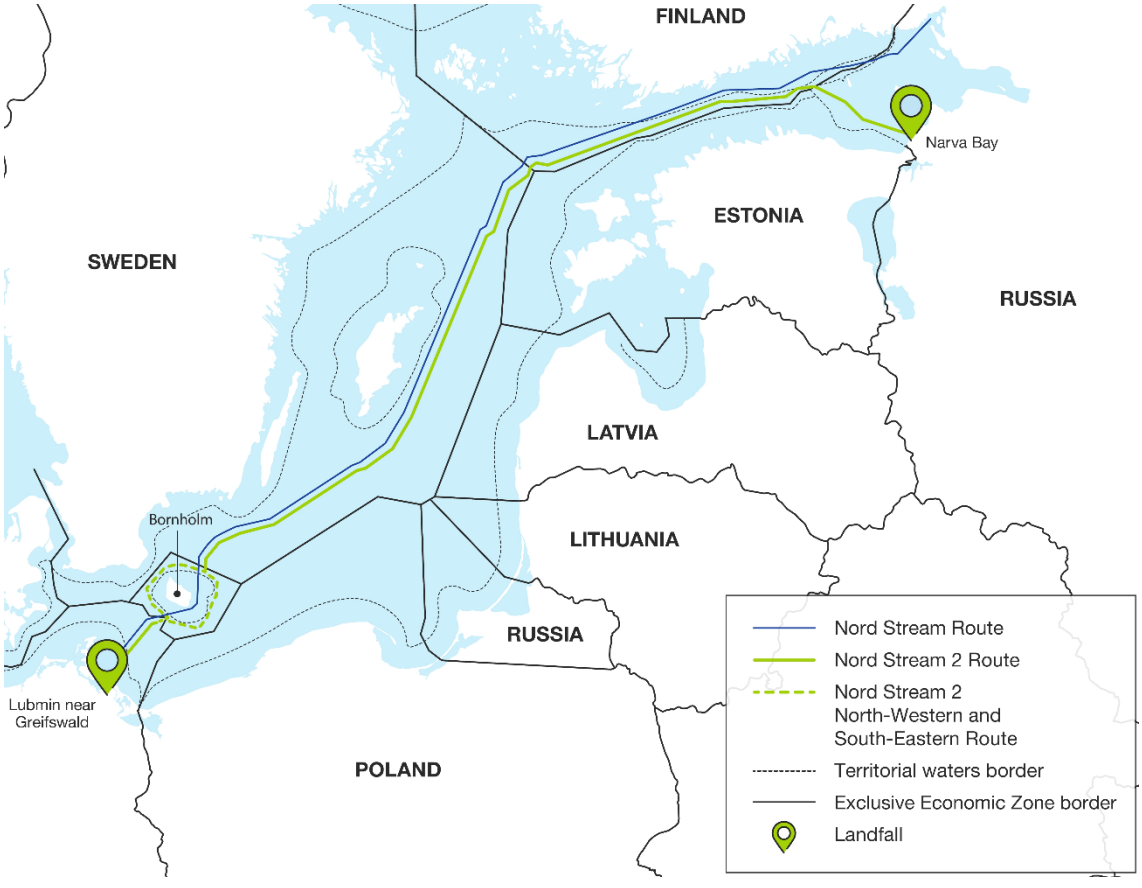
infrastructure towards new supply sources introduced to the market actual competition, it seems ridiculous to claim that in this manner Russia lost *competitive* opportunities. On the contrary, it can be argued – as the EU did – that measures such as the TEN-E regulation created effective competitive opportunities for everyone, including Russia. While it is certainly debatable whether "articles I:1 or III:4 of the GATT contain an obligation to address a perceived distortion of competition in the domestic market of a Member" (WT/DS476/R, par. 7.1321), it is unclear whether this particularity of network-bound trade can find space within the WTO framework. The panel report suggests "that measures that, through regulatory or financial incentives, aim to diversify away from a monopolistic supplier, or to promote infrastructure connections between an importing WTO Member and other Members with which the importing Member would otherwise not trade, will likely be inconsistent with Articles I:1 or III:4 [of the GATT]" (Pogoretskyy & Talus, 2019, p. 18), which however would not be compatible with the WTO's implicit objective of achieving trade efficiency by preventing trade manipulation, protectionism and unnecessary trade restrictions. If the Appellate Body were to confirm the Panel's ruling, the second issue will be whether such measures can find shelter in other general provisions besides article XX(j) of the GATT. A possibility in this regard represents article XX(d), which allows for measures that are necessary to secure compliance with laws or regulations which are in conformity with the provisions of the GATT (Pogoretskyy & Talus, 2019). However, the progression of the EU gas market over the years may have reduced the importance of the issue at hand, as the increase in cross-border reverse flow capacity, in LNG capabilities and in storage facilities has created a very different scenario compared to 2014.

Either way, the dispute is going to remain a looming shadow over the EU-Russia energy relations for the upcoming years and represents yet another element of complexity for the already problematic relationship between the two energy actors, which extends now to legal instruments as well. At the moment it seems, however, that another topic has taken the stage in EU-Russia energy relations: the Nord Stream 2 pipeline.

4.3. Nord Stream 2: boon or bane of EU energy security?

Nord Stream 2 is a pipeline in construction by Gazprom that is going to carry a considerable amount of gas from the Yamal peninsula to the European Union, following the same route as the already constructed Nord Stream 1 pipeline (fig. 5). With an annual capacity of 55 bm^3, it is going to double the volume of natural gas that can be delivered by the existing Nord Stream infrastructure. Due to these characteristics, it "has become one of the most contested pipeline projects in European history" (Mikulska, 2018, p. 45) and raised concerns about an increase of Russian influence on the EU gas markets and about the diversification of supply sources. While some member states of the EU support the project and claim that it will be beneficial for EU energy security, many consider it to negatively affect the declared objectives of the 2014 Energy Security Strategy. The Commission and the European Parliament are at the forefront of the opponents to Nord Stream 2 and have tried to stop or, at the least, to minimize the

Figure 5: Route of the Nord Stream 2 pipeline



Source: Nord Stream 2 AG, 2019d.

potential negative impacts of the new infrastructure predominantly by legal means. In the wider context, the pipeline is part of Gazprom's strategy to circumvent gas transit through Belarus and Ukraine and to obtain direct access to the EU gas market. It is therefore necessary to first explore the political background and the different arguments around Nord Stream 2.

4.3.1. Political and legal background

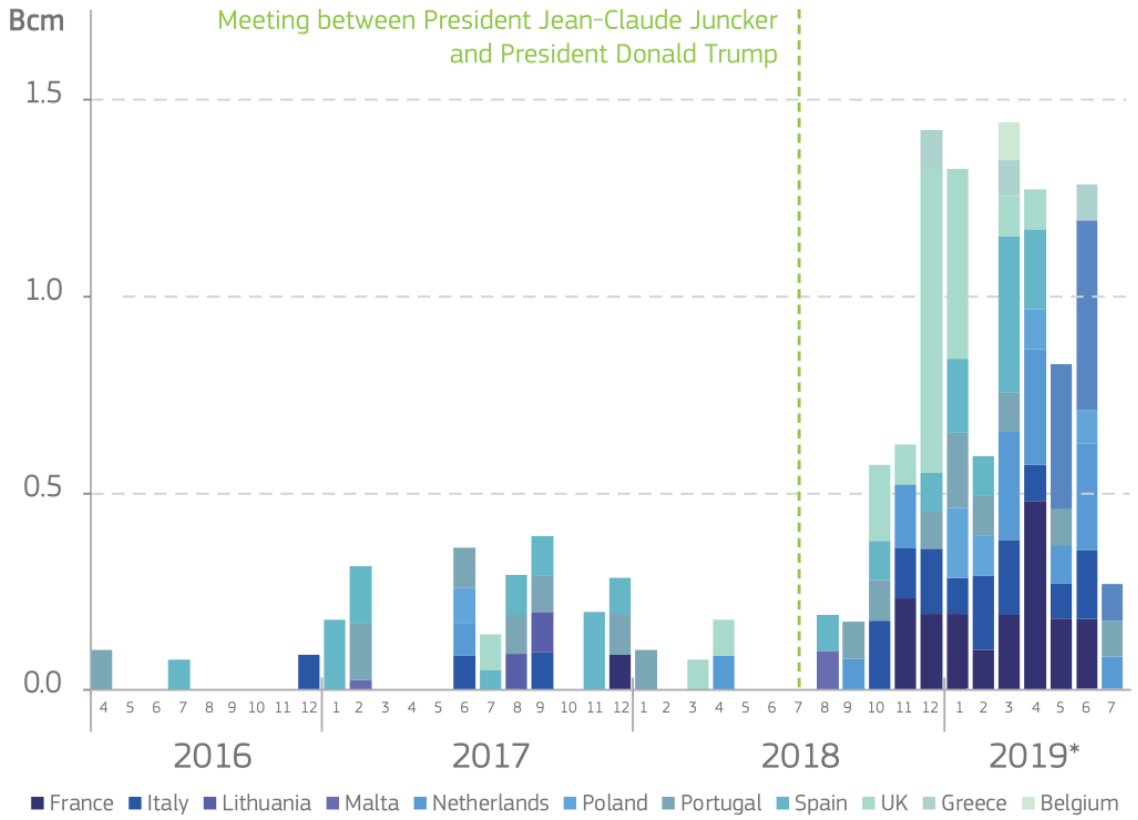
The Nord Stream 2 project has been controversial since its very beginning. Tracing back to a shareholder agreement between Gazprom and five European energy companies in 2015, each of the companies was supposed to hold a 10% stake on the project while Gazprom would have obtained 50%. However, they quickly withdrew from the agreement after the Polish antitrust authority threatened to challenge the joint venture (Mikulska, 2018, p. 47). Thus, the Swiss company in charge of planning, constructing and operating the pipeline, Nord Stream 2 AG, is now totally owned by Gazprom, with the five European companies ENGIE, OMV, Shell, Uniper and Wintershall DEA financing about 50% of the project. With the new pipeline Gazprom expects to gain more leverage on the EU from several perspectives:

(1) by expanding transmission capacity via a direct route to the heart of the EU, Gazprom can deliver higher volumes of cheap gas; given the fact that Russia disposes of the biggest natural gas reserves of the world, production costs are lower compared to its competitors; combined with the progressive switch of Gazprom's business model from price defence (long-term contracts, take-or-pay conditions and indexation to oil product prices) to market share protection (discounts, partial spot pricing and lower minimum offtake requirements) Russian gas "could quickly become the price reference on spot markets if it were to abandon [long-term contracts] and fully embrace spot trading" (Giuli, 2018, p. 9).

(2) at the same time, by cementing its central position in the EU gas market as cheap gas supplier, Gazprom is able to offset future LNG competition; both Norway and Gazprom lost EU market shares in 2018/2019 due to an increase in LNG imports

of almost 300% (Reuters, 2019a). Additionally, a cornerstone of the joint statement on a strategic cooperation in the energy sector between EU and USA from 25 July 2018 was the development of LNG capacities. LNG imports from the USA have steeply increased ever since (fig. 6) and could more than double by 2023 (European Commission, 2019). Nord Stream 2 is therefore crucial for Gazprom to undermine EU diversification efforts.

Figure 6: USA LNG imports by EU member states from 2016



Source: European Commission, 2019.

(3) Nord Stream 2 would furthermore allow Gazprom to reroute gas volumes from the Ukraine and Eastern Europe route, saving billions of dollars in transit fees and evading further controversies with Ukraine; the construction of the Nord Stream 2 pipeline already has visible impacts on the Ukraine-Russian energy relations. The project allowed Gazprom to avoid a conciliatory attitude and to instead maintain a more aggressive approach after the detrimental 2018 ruling of the Stockholm Arbitration Court on a longstanding commercial dispute with

Naftogaz, the state-owned national oil and gas company of Ukraine, immediately threatening the latter to initiate procedures to terminate transit contracts. Nord Stream 2 conferred Gazprom also a stronger bargaining position in the recently concluded negotiations with Ukraine and the EU on a possible extension of the gas transit contracts, as the existing 10-year agreement expired on 31 December 2019 (Sabadus, 2019).

(4) The new pipeline could help Gazprom also in the "divide and conquer" (Austvik & Lembo, 2017, p. 661) or "carrot and stick" strategy (Mikulska, 2018, p. 56) that it supposedly enacts in the European Union. Depending on its real commercial intentions, it could isolate the Eastern European member states from the western market and sell natural gas to them at worse conditions, due to lower transit volumes through Ukraine and lack of west-east transmission capacity (Giuli, 2018).

Given these considerations, it is no surprise that the EU member states are divided on the issue. Germany, Austria and the Netherlands favour the project for its potential to prevent unexpected supply disruptions and to deliver a large amount of cheap gas. On the contrary, the countries in Eastern Europe, especially Poland and the Baltic States, oppose it fiercely arguing that supply diversification will be substantially limited due to the fact that investments in developing alternative sources are being discouraged. The divide is also a matter of difference in energy security conceptions. On the one hand, the first group considers energy security on this issue predominantly in economic terms, i.e. in terms of affordability, on the other hand the opponents to Nord Stream 2 do not believe "that the market and solidarity mechanisms of the IEM can guarantee its energy security" (Giuli, 2018, p. 18) in terms of availability. Moreover, the European Parliament has repeatedly called to cancel the construction of Nord Stream 2, because "it is a political project that poses a threat to European energy security" (European Parliament, 2018).

On top of the political discussions about the opportunity of the project, legal concerns have been raised. In fact, the applicability of the Third Energy Package, i.e. of Directive 2009/73/EC, to Nord Stream 2 has been questioned. At first, the European Commission

argued that the EU market rules applied to full effect also to offshore pipelines that supply natural gas to the EU, asserting in this manner an extraterritorial effect of EU legislation. However, the Commission's legal service and several legal experts have highlighted that, on the contrary, "[i]t is clear and unequivocal that the Gas Market Directive was not intended to be applicable to external gas pipelines that bring gas into the internal EU natural gas pipeline network. […] The applicability of EU energy law begins when the gas has been moved into the internal EU pipeline network" (Talus & Wüstenberg, 2019, p. 328). Thus, only those parts of the pipeline that were located on EU territory, that is in the territorial sea of its member states, could be subject to the rules of the Third Energy Package. A concerning outcome for the Commission, which wanted to ensure that the operation of the new pipeline was subject to the general rules on unbundling, third-party access and transparent tariff regulation, in order to compensate potential negative impacts by the project. Moreover, a solution to the issue could not be provided by the legal regime on the Nord Stream 1 pipeline, as "[t]he European Commission and member states avoided considering whether EU law should apply" (Giuli, 2018, p. 6). Other import pipelines are traditionally governed by Intergovernmental Agreements, which specifically define their legal status. Consequently, the Commission argued that a pipeline with only one entry point cannot be governed by two different legal regimes or operated in a legal void with regard to its offshore parts (Lilkov & Freudenstein, 2018, p. 5) and, thus, requested a mandate[78] from Member States to negotiate with Russia an agreement (European Commission, 2017a) on a coherent regulatory framework for Nord Stream 2. The Council's legal service[79], however, opposed these arguments. In respect of the alleged legal void, the opinion highlights that the offshore parts of the pipeline would be anyway subject to international law, in particular the United Nations Convention on the Law of the Sea (UNCLOS)[80], while Russia, the EU and the relevant member states have jurisdiction over

[78] European Commission, Recommendation for a Council Decision authorising the opening of negotiations on an agreement between the European Union and the Russian Federation on the operation of the Nord Stream 2 pipeline, document 10249/17, 12 June 2017.

[79] Council of the European Union, Opinion of the Legal Service, document 12590/17, 27 September 2017.

[80] UNCLOS provides specific rules for laying submarine cables and pipelines on the continental shelf (art. 79) and in the high seas (art. 112 ff.). It establishes the general principle according to which all States

their respective access points. It also excludes a conflict in laws, as Directive 2009/73/EC is not applicable to an offshore import pipeline under the jurisdiction of the EU and its member states. The final step undertaken by the Commission to interfere with Nord Stream 2 was a proposal presented on 1 November 2017 to amend Directive 2009/73/EC, so that the new pipeline would be subject to its legal regime.

4.3.2. The amendments to the Gas Market Directive

After almost two years of discussions, such amendments to the Gas Market Directive were officially introduced by Directive (EU) 2019/692 of the European Parliament and of the Council of 17 April 2019. The declared objective is threefold:

(1) to address obstacles to the completion of the internal market in natural gas which result from the non-application of Union market rules to gas transmission lines to and from third countries;
(2) to ensure that the rules applicable to gas transmission lines connecting two or more Member States are also applicable, within the Union, to gas transmission lines to and from third countries; and
(3) to establish consistency of the legal framework within the Union while avoiding distortion of competition in the internal energy market in the Union and negative impacts on the security of supply;

Thus, it introduces the term "gas transmission lines to and from third countries", to which the market rules laid out in Directive 2009/73/EC are extended. Recital n. 9 also clarifies the territorial extension of the Gas Market Directive, distinguishing between normal gas transmission lines to and from third countries and offshore gas transmission lines. For the former, the applicability of Directive 2009/73/EC remains limited to the territory (in its traditional sense of a delimited area of land) of the member states. As regards the

are freely entitled to lay submarine cables and pipelines on the continental shelf and on the bed of the high seas. As regards the Economic Exclusive Zone, the regime set out by article 79 applies through referral by article 58, par. 1. Thus, the coastal state has the right to adopt reasonable measures for the exploitation of natural resources and for the prevention, reduction and control of pollution from pipelines, and must consent to the delineation of the course of the pipelines. It only enjoys jurisdiction over pipelines that are used for the exploitation of its resources on the continental shelf or for the operation of artificial islands or installations under its jurisdiction.

latter, the area of applicability comprises the territorial sea of the member states where the first interconnection point with the member states' network is located. Thus, it embraces the general opinion according to which EU energy law is not characterized by extraterritoriality. In this manner, the Directive appears also in conformity with rules of international law such as UNCLOS.

The amendments can be divided into three different categories. The first category concerns the adjustment of the internal market rules to transmission pipelines to and from third countries. For this purpose, the definition of an "interconnector" in article 2, n. 17 of Directive 2009/73/EC is adjusted as follows:

Original formulation	Amendment
'interconnector' means a transmission line which crosses or spans a border between Member States for the sole purpose of connecting the national transmission systems of those Member States;	'interconnector' means a transmission line which crosses or spans a border between Member States for the purpose of connecting the national transmission system of those Member States or a transmission line between a Member State and a third country up to the territory of the Member States or the territorial sea of that Member State;

Consequently, the rules on unbundling, third party access and tariff regulation will also be applicable to transmission lines to and from third countries. It also means that any other legal act that refers to Directive 2009/73/EC for the definition of "interconnector" will be applicable to entry and exit points to third countries. Recital n. 13 of Directive (EU) 2019/962 explicitly provides in this manner for specific acts:

(1) Commission Regulation (EU) 2015/703 of 30 April 2015 establishing a network code on interoperability and data exchange rules;
(2) Commission Regulation (EU) 2017/459 of 16 March 2017 establishing a network code on capacity allocation mechanisms in gas transmission systems;
(3) Commission Decision 2012/490/EU of 24 August 2012 on amending Annex I to Regulation (EC) No 715/2009 of the European Parliament and of the Council on

conditions for access to the natural gas transmission networks;

(4) Chapters III, V, VI and IX, and Article 28 of Commission Regulation (EU) 2017/460 of 16 March 2017 establishing a network code on harmonised transmission tariff structures for gas.

However, it excludes such an extended application for Commission Regulation (EU) No 312/2014 of 26 March 2014 establishing a Network Code on Gas Balancing of Transmission Networks. This raises questions about the value of this clause. Recitals do not entail legal effects but represent mere tools for the correct interpretation, for the explanation of the purpose and for the motivation of the legal act as required by art. 296 TFEU[81]. In fact, according to settled case law of the CJEU, the preamble to a EU act does not have binding legal force and does not represent a ground for derogating the provisions of the act in question nor for interpreting the provisions manifestly contrary to their formulation (Strozzi & Mastroianni, 2013, p. 270). Consequently, in the absence of an explicit amendment, the excluded provisions by recital n. 13 of Directive (EU) 2019/692 will also apply to entry and exit points to third countries, unless a systematic interpretation of them reasonably leads to a different conclusion. In respect of unbundling, an explicit extension to all the different models (OU, ISO, ITO and ITO+) has been introduced with regard to transmission systems connecting a member state with a third country between the border of a member state and the first connection point with that member state's network, if on 23 May 2019 the transmission system belonged to a vertically integrated undertaking. This means that the part of Nord Stream 2 that is located under an EU member state's jurisdiction will be subject to the strictest unbundling model, i.e. the ownership unbundling model, whereas already existing transmission lines to and from third countries are allowed to choose the alternative models. The new Directive also affects article 34, par. 4 of Directive 2009/73/EC on cross-border disputes revolving around the access to upstream pipeline networks. If the upstream pipeline network stems from a third country and connects to at least one member state, all the member states must consult each other and the member state

[81] Art. 296, par. 2 TFEU: "Legal acts shall state the reasons on which they are based and shall refer to any proposals, initiatives, recommendations, requests or opinions required by the Treaties."

where the first entry point to the member states' network is located must consult the relevant third country to ensure that the rules on access are applied. This novelty, however, does not affect Nord Stream 2, which is a transmission pipeline and not an upstream pipeline according to the definitions laid out in Directive 2009/73/EC.

The second category of amendments concerns exceptions and derogations. One of the conditions required for the eligibility of a major new gas infrastructure for an exemption from unbundling, third party access, transparency and tariff regulation rules, namely article 36, par. 1(e) of Directive 2009/73/EC, has been reformulated:

Original formulation	Amendment
the exemption must not be detrimental to competition or the effective functioning of the internal market in natural gas, or the efficient functioning of the regulated system to which the infrastructure is connected;	the exemption must not be detrimental to competition in the relevant markets which are likely to be affected by the investment, to the effective functioning of the internal market in natural gas, the efficient functioning of the regulated systems concerned, or to security of supply of natural gas in the Union;

The change seems to appear somewhat redundant, considering that the condition set out by paragraph 1(a) asks the investment to enhance competition in gas supply and security of supply. If the new infrastructure enhances security and competition already, it is difficult to imagine how granting the exemption may negatively affect these values. The additional phrase “or to security of supply of natural gas in the Union”, however, may lead to the conclusion that the condition *ex* par. 1(a) in reality refers to security of supply not of the Union, but only of the relevant member state or of its affected gas network. Only in this manner, a situation in which the exemption contributes to the competition and security of supply of the single member state but at the same time negatively impacts these values referred to the Union as a whole can reasonably be hypothesized. As such, par. 1(e) requires adopting a wider perspective and examining the potential impacts of the exemption within the whole Union. It is uncertain, though,

whether or not the detrimental effects that stem from granting the exception must be more significant than the benefits provided by the investment in a perspective of balancing. Directive (EU) 2019/692 also provides that the regulatory authority which decides on the exemption *ex* art. 36 must consult, before the adoption of the decision, the "national regulatory authorities of the Member States the markets of which are likely to be affected by the new infrastructure" and "the relevant authorities of the third countries, where the infrastructure in question is connected with the Union network under the jurisdiction of a Member State, and originates from or ends in one or more third Countries". The national regulatory authorities can, therefore, no longer adopt the decision on their own, but must take into account the opinions from other member states and, in the case of infrastructure from or to third countries, the relevant foreign authorities, which in practice translates into a reinforced obligation of motivation. Furthermore, the consultation with third countries should be conducted "with a view to ensuring, as regards the infrastructure concerned, that this Directive is applied consistently in the territory and, where applicable, in the territorial sea of that Member State" (art. 36, par. 4). This seems to imply "that the conditions of the exemption that could be granted [..] would have to be identical both in respect of the section of a pipeline within a member state(s) concerned and in respect of the section of a pipeline between the border of the EU jurisdiction and the first interconnection point" (Yafimava, 2018, p. 139).

Directive (EU) 2019/692 also introduces a new waiver regime. The new article 49a, called "Derogations in relation to transmission lines to and from third countries", provides that in relation to such pipelines, if completed before 23 May 2019, the member state where the first connection point is located can decide to derogate from general gas market rules "for objective reasons such as to enable the recovery of the investment made or for reasons of security of supply". The derogation is limited to the member state's territory and territorial sea and does not require a formal request. However, granting a derogation must not be "detrimental to competition on or the effective functioning of the internal market in natural gas, or to security of supply in the Union". The derogations can apply for a maximum period of 20 years and can be subject to further conditions that

contribute to the effective functioning of the internal gas market or to the security of supply. Finally, they do not apply if the third country has the obligation to transpose Directive 2009/73/EC Directive and which effectively implements it in its legal order under an agreement concluded with the EU. This is effectively a clause for countries that are part of the EEA[82] and/or of the Energy Community[83]. According to the Commission, it is not needed to grant these countries a derogation, as "rules which are similar to the Third Energy Package are already applicable or will become applicable in the future" (European Commission, 2017b). The reasons for the introduction of the new exception are laid out in recital n. 4 of Directive (EU) 2019/692: "To take account of the lack of specific Union rules applicable to gas transmission lines to and from third countries before the date of entry into force of this Directive, Member States should be able to grant derogations from certain provisions of Directive 2009/73/EC to such gas transmission lines which are completed before the date of entry into force of this Directive". Thus, the rationale is to avoid legal and political controversies with investors and trading partners' governments that would arise from the change of the legal gas market framework. The derogation regime intends to protect legal certainty and legitimate expectations for those pipelines from and to third countries where the final investments were concluded without the application of Directive 2009/73/EC (Talus & Wüstenberg, 2019, pp. 330-331). Finally, the Commission plays a minor role in the granting of derogations. In fact, only upon request of the relevant member state, it can decide to act as an observer in the consultations to ensure the consistent application of the Directive.

As regards the relationship between the two waiver regimes, article 49a does not replace article 36. The most striking difference is certainly the granting procedure. While an exemption is granted by the national regulatory authority and transmitted to the Commission for approval, derogations are granted on a purely national basis without any

[82] This affects most notably pipelines from and to Norway.

[83] The Energy Community is an international organisation founded in 2005. Its objective is the extension of the EU internal energy market rules to countries in south-east Europe and beyond. By signing the founding treaty, the parties committed to implement the relevant EU energy *acquis*, including Directive 2009/73/EC, according to a specific timetable. The current members are the EU, Albania, Bosnia and Herzegovina, Kosovo, North Macedonia, Moldova, Montenegro, Serbia, Ukraine and Georgia.

involvement of the Commission. It is unclear, however which authority – whether the government or a national regulatory authority – is responsible for granting the derogations. It also appears that derogations may be granted by the member state *ex officio*, that is in absence of any prior request, given, unlike for exemptions, the lack of any explicit statement in this regard. Article 49a also does not set out a detailed list of criteria based on which the decision has to be considered, only generally mentioning "objective reasons such as to enable the recovery of the investment made or for reasons of security of supply". It is not specified whether the list of examples is exhaustive, thus it appears that further objective reasons may be introduced. The decision on derogations must be adopted by 24 May 2020, which suggests that the time frame for the granting procedure must not exceed one year from the entry in force of Directive (EU) 2019/692. However, there are aspects in which the two regimes overlap. Notably, both exemption and derogation can be granted in respect of article 9, article 32 and article 41, par. 6, 8 and 10 of Directive 2009/73/EC. However, the duplication is only apparent: in fact, a derogation can only be granted for the section of a transmission pipeline to or from third countries between the border of EU jurisdiction and the first interconnection point, while an exemption covers in addition the section of a pipeline past the first connection point. It is moreover worth noting that a derogation, unlike an exemption, may apply to articles 10 and 11 of Directive 2009/73/EC on the certification of TSOs, while, conversely, the application of articles 33 and 34 on access to storage and upstream pipelines can only be exempted in article 36. Thus, the amendments have "*de facto* split the process of granting […] waivers into two layers" (Yafimava, 2018, p. 140):

(1) the section between the border of EU jurisdiction and the first interconnection point for articles 9, 10, 11, 32, 33, 34 and 41;
(2) the section of a pipeline past the first connection point for articles 9, 32, 33, 34, and 41.

The last category of amendments provides a regime for international agreements between a member state and a third country on the operation of a transmission pipeline or an upstream pipeline network. Since these pipelines would be subject to separate jurisdictions for the section within the EU border and the section outside the EU border,

the rationale is to avoid a conflict of laws. Article 49b, called “Empowerment procedure”, lays down two different procedures applicable to both transmission lines and upstream pipeline networks to and from third countries. The first one set out by paragraph 1 provides that existing agreements remain in force until a new subsequent agreement between the Union and the same third country has been concluded or until the second procedure is followed. The second procedure (par. 2 to 15) grants the Commission the possibility to authorise negotiations between a member state and a third country that amend, extend, adapt, renew or conclude an agreement on the operation of a pipeline with a third country. The authorisation is required for agreements that concern entirely or partly matters of the Gas Market Directive and for the parts of other agreements that may affect EU common rules. Upon obligatory notification by the relevant member state, the Commission decides on authorising the formal negotiations within 90 days. If the authorisation is granted, the Commission must be regularly kept informed about the progress and the results of the negotiations. Moreover, the relevant member state is not allowed to sign the agreement before having transmitted the final text to the Commission, which proceeds to authorise the signature within 90 days. Both requests for authorisation may be rejected if the negotiation or the final agreement is

(1) in conflict with EU law other than incompatibilities with competence allocations between member states and Union;
(2) detrimental to the functioning of the internal market in natural gas, competition or security of supply in a Member State or in the Union;
(3) undermining the objectives of pending negotiations of intergovernmental agreements by the Union with a third country;
(4) discriminatory.

The assessment must also take into account whether the agreement concerns a transmission line or an upstream pipeline that contributes to the diversification of natural gas supplies and suppliers by means of new natural gas sources. Finally, the new article 48a allows TSOs to keep or to conclude technical agreements with other economic operators in respect of the operation of transmission lines to or from a third country. However, the agreements must be compatible with EU law and relevant decisions of the

national regulatory authorities.

4.3.3. Legal conundrums

With the recent changes introduced by Directive (EU) 2019/962, the Gas Market Directive and related EU acts such as the network codes become explicitly applicable to offshore and onshore pipelines to and from third countries with respect to the section between the border of EU jurisdiction and the first interconnection point in an EU member state. As can be seen in table 6, not only Nord Stream 2 is affected by the amendments, but also other future pipeline projects and existing pipelines originating from third countries. However, the specific circumstances and timing of the legislative change leave little doubt that Nord Stream 2 was the intended target, especially considering the specific problem of *de facto* discrimination in relation to the two different waiver regimes.

Nord Stream 2 results, in fact, not eligible neither for an exemption *ex* article 36, nor for a derogation under article 49a. For the latter, it is required that the infrastructure was completed before 23 May 2019, which is not the case for Nord Stream 2 unlike for existing pipelines. As regards the exemption regime, even if the German regulatory authority were to conclude that the project enhances competition and security of supply to the relevant markets and the exemption would not be detrimental to these values on EU level, article 36, par. 1(b) still requires that "the level of risk attached to the investment must be such that the investment would not take place unless an exemption was granted". Given that the final investment decision for Nord Stream 2 was taken in 2017, this criterion is not met. It could, however, be argued that in the past exemptions were granted in some occasions even though the final investment decision had not yet been taken (Yafimava, 2019, p. 7).

Furthermore, legal certainty would demand that an exemption should still be possible due to the fact that the final investment decision could not reasonably take into account such an unexpected and significant legislative change (Talus & Wüstenberg, 2019, p. 332) and perhaps would not have even been taken if the new regulatory framework had been

Table 6: Selection of existing and planned pipelines affected by the amendments

Supplying country	Existing pipelines	Future pipelines
Norway	Offshore pipeline network that connects to Germany, Belgium, France and UK	Offshore pipeline connecting Europipe II with Denmark
Russia	Yamal pipeline	Nord Stream 2
	Ukrainian pipeline network	
	Pipelines connecting to Finland	
	Gazprom-Transgaz Belarus pipeline	
	Nord Stream 1	
Algeria	TransMed pipeline	GALSI pipeline
	Maghreb–Europe Gas Pipeline	
	Medgaz pipeline	
Libya	Green Stream pipeline	
Caspian region		TAP
		TANAP

Source: Yafimava, 2018; ENTSOG Capacity Map 2017.

applicable at the time (Yafimava, 2019, p. 7), considering that especially large-scale projects are affected significantly by sudden changes in law. However, it can be highly doubted that such an argument would be acknowledged, as the Commission has the final say on granting an exemption. In contrast, other planned pipeline projects are not affected by this problem, either because the final investment decision has not yet been taken or because an exemption has already been granted[84] (for ex. in the case of TAP). Thus, the new design of the Gas Market Directive appears to directly preclude the possibility to obtain a waiver for those projects "where the final investment decision has been made and significant capital has been spent and committed already before the

[84] See European Commission, Exemption decisions and pending notifications of national exemption decisions for gas and electricity, *18 December 2018,* https://ec.europa.eu/energy/sites/ener/files/documents/exemption_decisions2018.pdf.

intended legislative change became known, but the pipeline has not yet been completed" (Talus & Wüstenberg, 2019, p. 331), thus denying legal certainty and protection of legitimate expectations to them. Suspiciously enough, the only project with these characteristics is Nord Stream 2. Directive (EU) 2009/692 does not provide any motivation as to why uncompleted pipelines without committed investments and uncompleted pipelines with committed investments are treated differently. Consequently, as Talus & Wüstenberg (2019) argue, it "appears to be highly discriminatory and is connected with the origin of the gas that will be transported" (p. 7) in a view to push diversification of supply and reduce dependence on Russian natural gas.

Shortly after the adoption of Directive (EU) 2019/692, the company in charge of the project, Nord Stream 2 AG, undertook legal steps to challenge the amendments. Firstly, it initiated the investment dispute settlement procedure under the Energy Charter Treaty (ECT)[85] on 12 April 2019. Article 26 of the ECT provides that disputes between an investor of a contracting party[86] and another contracting party regarding investments must be settled amicably within three months. If such a private settlement cannot be reached, the investor may submit the dispute to the courts of administrative tribunals of the signatory which is part of the dispute or initiate an arbitration proceeding. Although there was a meeting between the Commission and Nord Stream 2 AG on 25 June 2019, a settlement could not be reached. Thus, a notice of arbitration was filed by the latter on 26 September 2019 in order to ascertain the violation of articles 10 and 13 of the ECT by the EU (Hoch, 2019), which oblige the signatory states to guarantee equitable and transparent treatment for investors that is no less favourable than that which it accords to domestic or other investors and which forbid measures that have an equivalent effect to nationalization or expropriation of investments.

[85] The Energy Charter Treaty (1994) is an international agreement that provides a multilateral framework for cross-border energy cooperation. It focuses on the protection of foreign investments, on non-discriminatory conditions for energy trade, on the resolution of disputes between countries and between investors and countries, and on the promotion of energy efficiency (Energy Charter Secretariat, 2019). It currently has 54 signatories. The Russian Federation signed the treaty and applied it provisionally but has so far not ratified it.

[86] The registered office of Nord Stream 2 AG is located in Switzerland, which is a signatory of the ECT.

Secondly, upon the expiry of the three-month timeframe, Nord Stream 2 brought an action of annulment to the General Court of the EU on 25 July 2019 (*Nord Stream 2*, T-526/19) while reserving at the same time the possibility to proceed against the EU separately with arbitration according to article 26, par. 2(b) and 2(c) of the ECT (Nord Stream 2 AG, 2019b). Thus, it is the first investment dispute initiated by a foreign investor against the EU under the ECT (Talus & Hancher, 2019). The company requested the annulment of Directive (EU) 2019/692 for:

(1) the violation of the principle of equal treatment, because, unlike all the other existing import pipelines, it excludes the possibility for a derogation, despite the investment that had already been incurred;
(2) infringing the principle of proportionality, given that it cannot achieve its stated objectives or make a sufficiently meaningful contribution to those objectives that outweigh the imposed burdens;
(3) breaching the principle of legal certainty, since it fails to consider the specific situation of Nord Stream 2 and is specifically designed to have a negative impact on it;
(4) misuse of powers;
(5) the breach of essential procedural requirements laid out by Protocols No 1 and 2 to the TEU and TFEU and the Interinstitutional Agreement on Better Law-Making;
(6) lack of motivation under article 296 TFEU.

Furthermore, the company responsible for operating the first Nord Stream pipeline, Nord Stream AG, submitted an action of annulment regarding Directive (EU) 2019/692 on 26 July 2019 to the General Court (*Nord Stream*, T-530/19) as well, alleging the violation of:

(1) the principle of proportionality under article 5, par. 4 TEU due to the fact that the deadline for obtaining potential derogation decisions is considered to be excessively short;
(2) article 296 TFEU for lack of motivation regarding the introduction of the excessively short deadline;

(3) the principle of legitimate expectations because it unjustly limits the possibility to obtain derogations.

Both companies must satisfy the standing requirements for the admissibility of their actions. In fact, article 263 TFEU provides that natural and legal persons can only challenge an act which is "addressed to that person or which is of direct and individual concern to them" or "a regulatory act which is of direct concern to them and does not entail implementing measures". In the absence of definitions by the treaties, the ECJ had ample opportunities to clarify and establish the interpretation of these requirements and has formed a settled case law on this issue over the years. Thus, an act addresses a person when it was adopted formally vis-à-vis that person, which commonly is the case of an individual decision. The direct and individual concern, on the contrary, is more difficult to show. On the one hand, an act is of direct concern if it directly affects the legal situation of the person and does not entail any implementation, unless such implementation is purely automatic and immediate, without entailing discretion and requiring intermediate rules[87]. On the other hand, it is of individual concern when it differentiates the relevant person due to certain peculiar attributes or certain circumstances in such a way that it distinguishes said person individually from the more general group of persons theoretically considered by the act[88]. Lastly, an act is regulatory if it is of general application and not adopted with the ordinary legislative procedure according to article 289 TFEU[89]. Considering that in the proceedings at issue the challenged measure is a Directive, i.e. an act of general application, that has been adopted with the ordinary legislative procedure, the applicants must show that they are directly and individually concerned by it. As regards Nord Stream AG, it will be difficult to satisfy the individuality requirement. In fact, it is hardly imaginable how the company is individually differentiated from the other operators of completed import pipelines, to which the deadline for derogation decisions applies as well. In fact, according to the strict interpretation by the ECJ, it is not enough that the affected group may be closed and

[87] See *Dreyfus v Commission*, C-386/96 P, par. 43.
[88] See *Plaumann*, C-25/62, p. 107.
[89] See *Inuit Tapiriit Kanatami*, C-583/11 P, par. 58-61.

consist of a small number of legal persons[90]. Moreover, it can be argued that the pleas in law raised by the company do not show a direct impact on its interests. In fact, it is the responsibility of the member state to respect the deadline. The circumstance that the deadline is short is as such not directly causing a distinct change in its legal position[91], nor restricting its right to apply for a derogation[92]. If the request was submitted and the deadline is not met by the competent authority, the applicant will have to activate the available legal tools in the relevant member state, submitting an action for failure to act. In respect of Nord Stream 2, however, it is very probable that the Court grants the admissibility of the action, due to the considerations set forth before. In fact, it is the only incomplete pipeline with a final investment decision to which the right to apply for a derogation is denied. This circumstance isolates and sets it individually apart from all the other pipelines affected by the amendment, while directly impacting on its legal situation. Furthermore, the pleas that have been raised are congruent with the results of the analysis carried out in this section. Hence, it is very likely that Directive (EU) 2019/692 will be annulled for its discriminatory treatment. Either way, after the WTO panel report and the annulment of the OPAL exemption the General Court's decision will be another landmark case for EU energy law, energy security and energy relations with Russia within a short time frame.

Besides the appearing inconsistencies with general legal principles of the EU's legal system, Directive (EU) 2019/692 also appears to infringe applicable WTO rules. The recent WTO panel report WT/DS476/R of 10 August 2018 on the TEN-E measure provides significant indications in this regard[93]. In fact, the Panel declared that the stated objective of diversification of gas supply and the criteria provided for the designation of PCIs are directed at developing infrastructure that would connect supply sources other than Russia to the EU, thus providing more favourable conditions for any natural gas that is not of Russian origin. As such, the Panel found a violation of articles I:1 and III:4 of the GATT, due to the fact that Russian gas is discriminated in relation to both domestic gas

[90] See *Weber*, T-482/93, par. 65 ff.; *Jégo-Quéré*, C-263/02 P, par. 46.
[91] See *IBM v Commission*, C- 60/81, par. 8.
[92] See *Connaughton*, T-541/93, par. 35.
[93] See also chapter 2, section 4.2.8.

and natural gas of any other foreign origin. Similarly, the design and structure of the two waiver regimes set out by the amendments entail a modification of competitive opportunities to the detriment of Russian gas, given that Nord Stream 2 is the only pipeline that cannot benefit from an exemption, nor from a derogation. If Russia were to challenge articles 36 and 49a of Directive 2009/73/EC and the Panel interpreted the requirement according to which the waiver must not be detrimental to competition of security of supply in the Union as diversification of supply connected to the origin of natural gas, it is likely that the MFN and NT principles of the GATT would be found violated once more. The new framework does, indeed, "clearly [treat] interconnectors between other third countries differently from Russian interconnectors" (Talus & Wüstenberg, 2019, p. 337), to the detriment of the latter. However, there are also arguments for the groundlessness of Nord Stream 2's claims. Riley (2019) argues that "on closer examination, NS2's line of argument looks far from strong", due to the fact that the final investment decision has been initiated before obtaining all the permits, thus leading to the conclusion that it was based on an unnecessary risk and as such not prejudiced by Directive (EU) 2019/692. Moreover, by merely shifting gas flows from Ukraine to Nord Stream 2 instead of providing additional gas volumes, the EU could argue that the project is a legitimate threat to EU policy and security interests, with the amendments representing a timely and proportionate response to this danger.

Lastly, Directive (EU) 2019/692 touches upon the allocation of competences between the member states and the Union. Specifically, by establishing a new definition of interconnector and introducing new procedures for the conclusion and modification of agreements on the operation of interconnectors with foreign countries, the amendments operated a shift of external energy competences from the member states to the EU. In fact, before the legislative change, Directive 2009/73/EC was not applicable to import pipelines from third countries and, as such, their legal regime was not harmonised by common rules. Thus, the EU could not claim any external competences for the conclusion of agreements on the operation of such pipelines according to articles 3, par. 2, and 216 TFEU. With the introduction of article 49b, however, the framework of external competences on import transmission pipelines has significantly changed. The

EU enjoys now exclusive external competence to renegotiate any existing intergovernmental agreement between a member state and a third country on the operation of a transmission line or upstream pipeline network, in accordance with article 3, par. 2 TFEU. Member states share their external competence with the EU in case they take the initiative with respect to amending, extending, adapting, renewing or concluding an agreement on the operation of a transmission line with a third country that concerns matters falling, entirely or partly, within the scope of the Gas Market Directive. External competence is shared as well with regard to other relevant negotiations between member states and a third country for the part which may affect Union common rules. In the two cases of shared external competence, the Commission has the final decisive say by authorising both the negotiation and the signature based on the criteria seen at the end of the preceding section 4.3.2. Thus, the amendments indeed changed the "balance of power between EU and Member States" (Gram Mortensen, 2018) in respect of the external energy dimension. As regards the internal competences laid out in article 194, par. 2 TFEU, the new provisions do not seem to infringe upon the member states' right to determine the conditions for exploiting their energy resources, their choice between different energy sources and the general structure of their energy supply. The Council's legal service[94] highlighted, in fact, that the construction and operation of pipelines with one or more third countries is not prohibited or indirectly excluded.

4.3.4. Further outlooks

Despite all the efforts, Nord Stream 2 cannot be stopped. As of August 2019, 75% of the pipeline has been constructed (Nord Stream 2 AG, 2019c). Despite delays, it is no longer a matter of if, but when the project will be finished. Particularly problematic for the project was obtaining the permit to cross Denmark's Exclusive Economic Zone. Already in June 2019, Nord Stream 2 withdrew its application to cross the territorial sea of Denmark, south of the island of Bornholm, in parallel to Nord Stream 1, due to the fact

[94] Council of the European Union, Opinion of the Legal Service, document 7502/18, 26 March 2018.

that the Danish government could not reach a decision within two years (Nord Stream 2 AG, 2019a). Only on 30 October 2019, the Danish Energy Agency gave consent to cross the Danish Exclusive Economic Zone (Nord Stream 2 AG, 2019e). The delay was insofar significant as it (temporarily) strengthened the bargaining position of Ukraine and Poland in the negotiations for the extension of the gas transit contracts with Gazprom, which expired in December 2019 (Sabadus, 2019) and May 2020 (Russia Business Today, 2019), respectively, whereas the completion of Nord Stream 2 had initially been planned for the end of 2019. However, the new agreements that have been negotiated between Gazprom, Naftogaz and the Gas Transmission System Operator of Ukraine foresee the gas transit of only half the volumes compared to the former 10-year contract. Moreover, a settlement agreement has been reached, in which Gazprom and Naftogaz committed to abandon mutual claims under the former transit contracts. The new gas transit agreements are going to expire in 2024. Ukraine's role in EU energy security has therefore been significantly weakened.

The construction of Nord Stream 2 is currently being further delayed by US sanctions imposed on companies and individuals involved in the construction of the pipeline. The sanctions were adopted as part of the 2020 National Defense Authorization Act on 20 December 2019. Consequently, the Swiss company Allseas, which operates vessels laying sections of the undersea pipeline, has announced the suspension of its operations in order to "expect guidance comprising of the necessary regulatory, technical and environmental clarifications from the relevant U.S. authority" (Allseas, 2020).

Just like any new major pipeline, Nord Stream 2 will without doubt change the current situation of the internal gas market. However, with the new Gas Market Directive, the Commission believes to have gained more leverage on the regime for the operation of the pipeline. But any attempt to restrict capacity usage in Nord Stream 2 is problematic. Firstly, because the project is planned to connect to the new pipeline EUGAL, which is being built parallel to OPAL and "all of whose marketable capacity (80%) was allocated in March 2017 under legally binding contracts for 20 years" (Yafimava, 2019, p. 13). Secondly, because a discriminatory capacity cap would be, following the panel report on the OPAL exemption decision, inconsistent with applicable WTO rules.

As regards the diversification of supply efforts, it is important that the EU fosters and further develops its LNG market. On the one hand, LNG is not like pipeline gas according to WTO rules, allowing for differentiated treatment of the two products[95]. On the other hand, remaining plans for the diversification of gas supply have suffered significant blows and would not be able to effectively undermine Gazprom's market position (Giuli, 2018, p. 13). The GALSI pipeline project which would deliver Algerian gas to Italy appears to have been abandoned, while the commercial viability of the EastMed pipeline project between Israel and Cyprus seems to wane. The Nabucco project from Turkey to Austria failed. Moreover, the Southern Gas Corridor, flagship of the EU diversification policy and initially intended to deliver natural gas from several suppliers (Azerbaijan, Turkey, Georgia, Turkmenistan, Kazakhstan, Iraq, Egypt and Mashreq countries), has resulted so far only in the TAP and TANAP pipelines, which starting from 2020 are expected to deliver only 8-10 bcm/year and may, paradoxically, even supply Russian gas due to the completion of the TurkStream pipeline (Siddi, 2017b). According to Giuli (2018), "[t]hese cases expose the limits of the EU in diversifying gas supply. As a regulatory authority, the EU can only achieve diversification through markets" (p. 14).

[95] See chapter 2, section 4.2.4.

CHAPTER 3: NETWORK RELIABILITY

1. Securing a reliable supply in the era of energy transition

The dimension of network reliability refers to the adoption of measures directed at minimizing the frequency and extent of unexpected interruptions in the supply of electricity and gas. It can overlap with import dependency where the interruption is caused by an external supplier, thus making the same legal framework relevant. However, reliability must not be confused with the interrelated dimension of resilience. In fact, resilience describes a system's ability to withstand, recover from and adapt to extreme events – such as natural disasters, cyber-criminality or terrorist attacks – in a long-term view. Reliability, on the contrary, concerns the daily management and operation of the system network under ordinary conditions in a short-term to mid-term perspective. More specifically, it covers the following areas (Fulli, et al., 2017, pp. 4-5):

(1) operational security, i.e. the capability to retain a normal state or to return to a normal state as soon as possible within specific limits[96];
(2) flexibility, i.e. the ability to adapt generation or consumption of energy to expected or unexpected changes (International Energy Agency, 2014);
(3) adequacy, i.e. "the ability of the generation on the power system to match the consumption on the same power system" (ENTSO-E, 2019);

It also comprises continuity of supply, which focuses on the interruptions of supply the system experiences, i.e. "the events during which the voltage at the supply terminals of a network user drops to zero or nearly zero" (CEER, 2016, p. 19). By ensuring stable and continuous transmission, distribution and supply now and for the near future, network reliability is a vital part of energy security.

At present, reliability has gained more and more attention due to a transition happening in the EU energy system (Szulecki & Kusznir, 2018, p. 117). The deployment of renewable energy sources, technological innovations, the need for more transmission capacity and

[96] Article 3, par. 2(1) of Commission Regulation (EU) 2017/1485 of 2 August 2017 establishing a guideline on electricity transmission system operation.

ageing infrastructure represent serious challenges to the secure daily operation of the networks. This applies in particular to electricity networks where supply and demand have to be balanced at all times in order to keep the grid stable. Any disbalance can lead to power outages that entail serious repercussions in every aspect of human life, especially considering their unexpected and immediate nature. They hit societies unprepared and leave them often without alternative power source. Consequently, economic activities have to be stopped and essential services, such as healthcare, can no longer be provided. Depending on duration and extension, the overall cost of an outage can thus quickly amount to hundreds of millions of euro[97]. In this context, two main issues are of particular concern:

(1) the intermittency of renewable energy sources; the variability of wind and sun demands high flexibility of the energy system and a higher degree of coordination for the dispatch of generated electricity. Thus, forecasting errors about the available amount are more likely to happen. Moreover, a progressively increasing share of renewable energy sources in the electricity market due to climate change mitigation policies will continuously change the point of balance and cause higher dispatch costs.

(2) the so-called "missing money problem"; investments in energy infrastructure require a massive amount of upfront capital. However, increasing competition and transparency in the wholesale energy markets have led to an overall decrease in energy prices. As a consequence, the revenue generated can neither cover the cost of supplying power, nor attract the investments needed for the improvement and development of the network. Moreover, the increasing share of renewable energy sources is worsening the problem for two reasons. Firstly, renewable energy power plants have zero marginal costs[98], leading to an even faster decrease in market prices. Secondly, their intermittency requires to maintain a certain level of conventional capacity to ensure a stable baseload. In

[97] The estimated costs of specific outage scenarios can easily be simulated with the Blackout Simulator tool at https://www.blackout-simulator.com. For example, just a one hour-long blackout in the Italian region Trentino-Alto Adige/Südtirol on a Friday morning at 9am would already cause damages of 9.63 million euro.

[98] This means that after the plant is built the cost of producing more electricity is zero.

this way, “significant conventional capacity stays ‘dormant’ for extended periods, earning no revenue” (Leiren, Szulecki, Rayner, & Banet, 2019, p. 93).

To address the issues arising from these strong interconnections of network reliability with both the market paradigm and the climate change paradigm, policymakers have introduced a variety of measures. While in the gas sector the EU introduced basic standards related to infrastructure, supply and information exchange, the electricity sector is characterized by creative approaches of the member states which are potentially inconsistent with applicable EU law. The new Regulations (EU) 2019/941 and (EU) 2019/943 try to resolve these struggles.

2. Safeguarding a continuous gas supply

2.1. Reliability standards

As mentioned above, network reliability overlaps partially with import dependency if the relevant supply is provided *in primis* by third countries, as is the case with natural gas in the EU. Therefore, much has been already said in chapter 2 about the role of gas storage as commercial and strategic backup tool, the possibility to impose public service obligations on grounds of security of supply and the novelties of Regulation (EU) 2017/1938 on safeguarding the security of gas supply. However, some relevant measures introduced by Regulation (EU) No 994/2010 and adopted with minor changes by Regulation (EU) 2017/1938 have not been properly addressed so far.

The first one concerns the so-called infrastructure standard. According to article 5 of Regulation (EU) 2017/1938, member states or their regulatory authorities are obliged to ensure compliance with several minimum infrastructure requirements. Thus, in the event of a disruption of the single largest infrastructure in the relevant member state, the technical capacity of the remaining gas transmission network including interconnections, LNG and storage facilities connected to the calculated area must be capable of satisfying the total gas demand for a day of exceptionally high gas demand that would statistically happen once in 20 years. The capacity is calculated with the

harmonised “N – 1 formula” set out in Annex II. Alternatively, the obligation can be fulfilled by appropriate market-based demand-side measures foreseen by the Preventive Action Plan that are able to timely compensate the hypothetical disruption of gas. Neighbouring member states can optionally choose to ensure the standard jointly by giving due explanation in the regional chapter of their respective Preventive Action Plan. Moreover, TSOs are required to ensure permanent physical bi-directional capacity on all interconnections between member states, unless for connections to distribution networks or production and LNG facilities. It is also possible to obtain an exemption for four years from this obligation. If the investment for bi-directional capacity is deemed necessary for security of gas supply and causes costs in more member states or in one member state for the benefit of another one, the member states must reach a coordinated decision on cost allocation before taking any investment decision. However, it is prohibited to unduly distort the competition and the effective functioning of the internal market. Proposals for enabling an enhancing bi-directional capacity and requests for an exemption must be based on a cost-benefit analysis and follow the specific procedure provided by Annex III of Regulation (EU) 2017/1938. Thus, the regulatory authority receiving the proposal or the request must consult with the competent authorities of the member states that could benefit from the reverse flow capacity, the Agency for the Cooperation of Energy Regulators (ACER) and the Commission, which can issue an opinion on the matter within four months. If there is a joint proposal, the regulatory authorities consult with the project promoters and decide coordinatively on the cross-border allocation of necessary investment costs to be borne by the TSOs. Consequently, the involved authorities take a coordinated decision on the proposal or request, taking account of the issued opinions. The national authorities that issued an opinion can object to the decision as regards the facts and the assessment concerning in particular the cross-border cost allocation. ACER issues an opinion as well, following which the Commission can request modifications to the coordinated decision. In case a coordinated decision could not be reached or an agreement on the cost allocation was not possible, the Commission, consulting with ACER, adopts a decision covering all elements of the coordinated decision with the exception of the cross-border

cost allocation. In fact, the latter is decided by ACER after consulting the relevant regulatory authorities and the TSOs. Finally, article 5, par. 8 requires that any new transmission infrastructure contributes to the security of gas supply by developing a well-connected network with a sufficient number of cross-border entry and exit points according to the market demand and the risk assessments.

Another standard requires the national competent authorities to identify natural gas undertakings that must ensure the gas supply to protected customers in a series of critical situations:

(1) extreme temperatures during a seven-day peak period occurring with a statistical probability of once in 20 years;
(2) any period of 30 days of exceptionally high gas demand, occurring with a statistical probability of once in 20 years;
(3) a period of 30 days in the case of disruption of the single largest gas infrastructure under average winter conditions.

Although these scenarios are referring to rather extreme and rare situations, the standard ensures that there is sufficient volume of gas available also in situations of unusually high demand. The definition of "protected customers" did not substantially change with the entry into force of Regulation (EU) 2017/1938[99]. Thus, protected customers are household customer that are connected to a gas distribution network. Furthermore, if the member state decides so, it includes also small or medium-sized enterprises and essential social services that are connected to a distribution network, provided they do not represent more than 20% of the total annual gas consumption, as well as district heating installations that deliver heating to household customers and that are not able to switch to other fuels than natural gas. Additionally, now also small or medium-sized enterprises and essential social services can qualify as protected customers if they aren't able to switch to other fuels than gas. The Court of Justice had the occasion to clarify that the ordinary term "small or medium-sized enterprises" cannot be extensively interpreted to include small branches of large enterprises, small businesses belonging to integrated networks or small industrial plants belonging to a

[99] See chapter 2, section 3.1.

larger enterprise (*Eni*, C-226/16, par. 28-32). In fact, such entities do not require the same protection against potential supply disruptions. However, a member state can impose measures on natural gas undertakings to safeguard the supply of gas to a wider group of customers than the exhaustive list in article 2(5) if the restrictive requirements of article 6, par. 2 are respected. Thus, such an additional obligation must:

(1) be based on the risk assessment;
(2) be clearly defined, transparent, proportionate, non-discriminatory and verifiable;
(3) not unduly distort competition or the effective functioning of the internal market in gas and not endanger the security of gas supply of other Member States or of the Union;
(4) not negatively affect the ability of any other member state to supply gas to its protected customers in case of a national, regional or Union emergency; and
(5) respect the limits for national measures in case of a regional or Union emergency as set out by article 12, par. 5.

The same limits apply when introducing gas supply standards for protected customers that exceed the 30-day period. The supply standard can also be satisfied by energy efficiency measures or by the exchange of gas with different energy sources, as long as the same level of protection is guaranteed. In any case, the obligations must be non-discriminatory and cannot impose an undue burden on the natural gas undertakings.

Lastly, Regulation (EU) 2017/1938 stresses the importance of information exchange between member states and EU. These obligations change in relation to the different supply situations. In case of a declared crisis, the natural gas undertakings must inform the national competent authorities daily about the gas demand and supply forecasts for the upcoming three days, the flow of gas in the infrastructure and the period for which they expect to be able to supply the protected customers. If the emergency is regional or Union-wide, the national authority must additionally provide information on the implemented, requested and planned measures for mitigating the situation. After the emergency, the Commission must be provided with a detailed assessment of the emergency and the effectiveness of the taken measures. The assessment must cover, in

particular, the economic impact, the impact on the electricity sector and the assistance provided to or received from the EU or other member states. The Gas Coordination Group and the updates of the Preventive Action Plans and the Emergency Plans must take account of the assessment. An interesting novelty of Regulation (EU) 2017/1983 is, however, the obligation imposed on natural gas undertakings to disclose specific gas supply contract details to the national authority. This is necessary in case of contracts with a cross-border dimension and a duration of more than one year as well as for contracts that "individually or cumulatively with its contracts with the same supplier or its affiliates is equivalent to 28 % or more of yearly gas consumption in that Member State" (art. 14, par. 6(b)). Moreover, if a gas supply contract is considered threatening the security of supply of a member state, a region or the EU by the national authority or the Commission, the natural gas undertaking must provide the contract. Price information, however, is excluded from these obligations.

2.2. Congestion management and the gas network codes

The regulatory framework on EU network reliability for natural gas is complemented by Regulation (EC) No 715/2009 of the European Parliament and of the Council of 13 July 2009 on conditions for access to the natural gas transmission networks. Besides establishing non-discriminatory rules for access conditions to transmission systems, LNG facilities and storage facilities, it also provides "mechanisms to harmonise the network access rules for cross-border exchanges in gas" (art. 1). Congestion management and capacity allocation at cross-border interconnection are important for flexibility and balance of the Union-wide system. In fact, an imbalance in the system between two member states cannot be adjusted if there is no available capacity for gas flows. However, two different types of capacity congestion have to be considered:

(1) physical congestion, where demand exceeds the actual maximum transportation capacity of the relevant infrastructure; this can only be solved with network planning and infrastructure investments. However, this type of congestion is very rare in the EU gas market (Talus, 2011, p. 85).

(2) contractual congestion, where the level of firm capacity demand exceeds the technical capacity of the transmission line and all the available capacity has been contracted for; thus, network users cannot gain access to gas transmission systems despite the physical availability of the capacity. This problem can be addressed with specific congestion management procedures, which are covered by Regulation (EC) No 715/2009.

Article 16 of Regulation (EC) No 715/2009 provides general principles for both capacity allocation and congestion management. In fact, the maximum capacity at connection points and storage and LNG facilities, that system integrity and efficient network operation allow, must be made available. Capacity-allocation mechanisms and congestion management procedures must be non-discriminatory and transparent. In respect of the former, they have to provide economic signals for the efficient and maximum use of capacity, enable investment in new gas infrastructure and facilitate cross-border trade. Furthermore, the capacity allocation must be able to adapt to market changes and be compatible with the network access systems of the member states. Regarding capacity allocation, the system operators must offer unused capacity on the primary market on a day-ahead and interruptible basis, if there is contractual congestion. Interruptible services are, in fact, another flexibility tool for short-term needs. They entail the obligation to interrupt gas consumption for a certain period of time under given conditions (Dickx, Miriello, & Polo, 2014, p. 15). Users must also be able to resell their unused capacity on the secondary market. Moreover, article 21 requires that network balancing rules are fair, non-discriminatory, transparent and based on objective criteria.

These principles on capacity-allocation mechanisms and congestion management procedures are complemented by guidelines in Annex I of the Regulation, which, however, still did not go beyond a general character in their original formulation. The first set of guidelines is directed at TSOs and requires additionally that such mechanisms and procedures take into account system integrity and security of supply, do not hamper competition and are suitable for facilitating investment in new infrastructure. The implementation phase should include consultation of network users and agreements

with the relevant national authorities. The second set of guidelines concerns the congestion-management procedures case of contractual congestion. In that instance, TSOs must offer unused contracted capacity on an interruptible basis on the primary market if the capacity has not yet been offered by the network user on the secondary market. The revenues generated in this manner are split according to the rules decided by the regulatory authority.

Commission Decision of 24 August 2012 amended Annex I. It specified the area of application[100] and introduced new types of congestion management procedures that TSOs must adopt to fight contractual congestion[101]:

(1) oversubscription and buy-back scheme: the TSO offers more firm capacity than technically available on the presumption that a certain amount of capacity is likely unused by the capacity booker. However, determining the right amount of additional capacity to be offered is delicate and can be complex in networks with high booking levels, as there is the risk that all capacity will be booked and nominated for flows that can physically not be realized. This risk can be averted with the buy-back mechanism, where the relevant TSO can re-acquire a sufficient amount of capacity from network users. The buy-back system must be market based, so that all the interested network users can participate and indicate the price at which they are willing to renounce their acquired capacity rights. For this purpose, there is no distinction between network users that booked oversubscribed capacity and users that acquired technical capacity. However, before applying a buy-back procedure, the TSO must verify whether alternative technical and commercial measures are more cost-efficient (for ex. agreements with adjacent TSOs).

(2) firm day-ahead use-it-or-lose-it mechanism: if the assigned capacity is not used, it is reallocated to the market to free up short-term capacity. It is intended as an

[100] Thus, the guidelines apply to "interconnection points between adjacent entry-exit systems, irrespective of whether they are physical or virtual, between two or more Member States or within the same Member State in so far as the points are subject to booking procedures by users. They may also apply to entry points from and exit points to third countries".

[101] See also Commission Staff Working Document, Guidance on best practices for congestion management procedures in natural gas transmission networks, SWD(2014) 325 final, 11 July 2014.

alternative to the oversubscription and buy-back scheme for the cases in which the latter cannot effectively eliminate congestion. Thus, the national regulatory authority can decide to apply this procedure based on a comparative analysis of the relationship between the two procedures. However, before adopting any decision on this matter, the relevant regulatory authority must consult first with the other adjacent authorities and take their opinions into account. This especially important, since the use-it or lose-it mechanism and the oversubscription and buy-back scheme may be incompatible in certain circumstances, which defeats the ultimate goal of avoiding a congestion. The relevant authorities must therefore take a coordinated decision in order to ensure the effective functioning of the congestion management procedures.

(3) surrender of contracted capacity: this procedure allows the network users to renounce the contracted capacity they do not intend to use by re-offering it to the TSO, which then proceeds to reallocate it. It represents, therefore, a voluntary option for the network user in alternative to the right to offer the capacity on the secondary market. Users cannot surrender capacity products with a duration of a day or shorter. The congestion, however, can only be solved if the TSO manages to successfully reallocate the capacity. For the correct functioning of this procedure it is important that the user is not incentivized to instrumentalise the mechanism by booking firm capacity only then to re-offer it. Thus, the user must not obtain any benefit from this strategy. Furthermore, capacity can only be surrendered if all available capacity has already been allocated.

(4) long-term use-it-or-lose-it mechanism: when all capacity has been contracted and there is demand for more firm capacity, the TSO can partially or fully withdraw systematically underutilised contracted capacity. Thus, the mechanism is specifically targeted at preventing capacity hoarding, A network user is systematically under-utilising the contracted capacity where that user has not sold or offered it under reasonable conditions, especially when for no proper reason less than 80% of the contracted capacity is used from April to September

or October to March despite the contract having a duration of one year and when that user nominates and then re-nominates close to 100% of the capacity. The consequence of a withdrawal is the partial or complete loss of the contracted capacity for a certain period or the rest of the remaining contractual term.

According to ENTSOG's implementation report of 2018 (ENTSOG, 2018), most member states have fully implemented the guidelines. Only three TSOs were still in the implementation process. For two of them it was expected to terminate at the end of 2019. Most member states decided to introduce the oversubscription and buy-back scheme, through which 28% of the additionally offered capacity has been allocated to the market. Of the nine surveyed TSOs with congested interconnection points six have, on the contrary, implemented the firm day-ahead use-it-or-lose-it mechanism. In this manner, only 21% of the capacity that was made available has been reallocated, suggesting that the secondary market stepped in faster in providing the necessary capacity. In fact, the secondary market represents an important alternative to congestion management procedures for trading unused capacity, with 80% of total re-offered capacity being traded on it. The surrender mechanism and long-term use-it-or-lose-it mechanism, on the contrary, did not make any additional capacity available. Although the guidelines have shown progress in reducing the amount of contractual congestion, ACER's latest Annual Report (ACER, 2019) highlighted that, throughout 2018, significantly more interconnection points were congested. Consequently, ACER recommended to the Commission, inter alia, to amend the guidelines in order to improve their effectiveness, specially as regards the use of congestion management procedures as preventive measures.

Article 6 of Regulation (EC) No 715/2009 requires also the adoption of so-called network codes. These codes are a set of binding rules that represent a handbook for the market players regarding technical, operational and market practices as well as business processes. The adoption of them is a rather complex procedure that involves many different actors. The initiative is given by the Commission, which consults ACER, ENTSOG and other relevant stakeholders to establish an annual list that indicates areas on which network codes should be developed. Within six months, ACER must submit a non-

binding framework-guideline that provides clear principles in respect of which it then consults with ENTSOG and other stakeholders. If the guideline does not contribute to non-discrimination, effective competition and the efficient functioning of the market, the Commission can ask ACER to review it. The guideline is also adopted by the Commission if ACER does not respect the deadline or does not re-submit the reviewed guideline. Consequently, the Commission asks ENTSOG to develop a network code in conformity with the framework-guideline and to submit it to ACER within twelve months. ACER issues an opinion on the network code based on which ENTSOG may amend the code and resubmit it. If ACER is satisfied, it sends the finished network to the Commission. The Regulation also provides for the event that a network code could not be drafted or agreed on. If ENTSOG does not develop the code within the required period of time, the Commission can ask ACER to adopt a code. Moreover, the Commission itself can adopt a network code when ENTSOG or ACER failed to develop a code, if recommended by ACER or even on its own initiative. The network codes have the legal nature of Commission Regulation. Amendments to a code can be presented by ACER and by any person that has an interest in the code. After a consultation phase of ACER with the relevant stakeholders, it can propose to the Commission amendments to be introduced. On 17 March 2017, the development of network codes for the internal gas market was concluded. Of the four adopted network codes two are important for the reliability of the gas network:

(1) the Capacity Allocation Mechanism Network Code[102] on rules for allocating existing capacity and for determining and marketing incremental capacity;

(2) the Balancing Network Code[103] on gas balancing rules, network-related rules on nomination procedures, imbalance charges, settlement processes associated with daily imbalance charges and on operational balancing.

These network codes are, therefore, another important tool to ensure the reliable operation of the gas networks by involving as many market actors as possible and

[102] Commission Regulation (EU) 2017/459 of 16 March 2017 establishing a network code on capacity allocation mechanisms in gas transmission systems and repealing Regulation (EU) No 984/2013.

[103] Commission Regulation (EU) No 312/2014 of 26 March 2014 establishing a Network Code on Gas Balancing of Transmission Networks.

harmonising all the relevant rules. The implementation phase is supervised by the Network Code Implementation Monitoring Group, a coordinative forum reuniting the Commission, ACER, the European Network of Transmission System Operators for Electricity (ENTSO-E) and ENTSOG. ACER and ENTSOG are also required to regularly publish monitoring reports on the implementation and effects on the gas market. Moreover, on the Gas Network Codes Functionality Platform (FUNC) stakeholders can report issues and propose solutions related to the implementation of the network codes.

3. Risk-preparedness in the electricity sector

Similarly to the considerations already made in respect of natural gas[104], the increasing interconnectivity of electricity networks between the member states both contributes to and undermines energy security. While increased cross-border trade strengthens the internal market and ensures a continuous supply of electricity within the Union, any disruption in electricity supply occurring in a member state embodies a potential spill-over effect that can lead to a power outage in several member states. Even local incidents or imbalances can spread rapidly across the border due to the rules of physics of electrotechnology. It is therefore important that member states dispose of methods to correctly identify potential risks and to adopt measures on a regional and EU-wide basis that effectively prevent or mitigate a crisis in electricity supply. Moreover, due to the recent developments of the electricity network, by which consumers take on a more important role, energy storage possibilities are being developed and smart grids revolutionize the possibilities of supply, the risks are of different nature and the likeliness of a crisis arguably higher. The EU, however, was not very active in this regard and limited itself mostly to the regulation of the electricity market. Only very recently, Regulation (EU) 2019/941 filled the lack of regional cooperation and addressed the important issues in detail.

[104] See chapter 2, section 3.

3.1. A classic soft start

The EU has addressed the specific topic of safeguarding security of electricity supply with Directive 2005/89/EC of the European Parliament and of the Council. The soft approach provided general principles and objectives the member states had to align to in order to ensure an adequate level of generation capacity, an adequate balance between supply and demand, and an appropriate level of interconnection between Member States for the development of the internal market (art. 1). The Directive put particular emphasis on the necessary transparency and non-discrimination of security of electricity supply policies that would foster investments in new infrastructure and back-up capacity, leaving ample discretion to the member states in choice and implementation of such measures. The areas covered by the Directive are essentially operational security (art. 4), balance between supply and demand (art. 5) and network investment (art. 6). Thus, on the one hand, the member states were required to ensure that TSOs set minimum operational rules on network security, maintain an appropriate level of reserve capacity and consult with the TSOs and other relevant actors of the neighbouring interconnected countries. On the other hand, the national regulatory framework was required to provide the correct investment signals to enable the development of the networks according to the expected demand growth and facilitate maintenance and renewal of existing networks. Finally, the Directive provided for a reporting system between TSO, member state and Commission.

This very general legal regime allowed the member states to adopt very different approaches to the prevention, preparation for and mitigation of crisis situations. The differences concerned in particular the assessment of risks, roles and responsibilities and the very definition of "crisis situation". Moreover, the lack of any binding regional cooperation lead to national rules and practices that focused solely on the national context and disregarded the cross-border dimension. This came alongside a lack of information, communication and transparency between the member states in a crisis situation.

Later interventions, however, did not fully address these issues but partially superseded Directive 2005/89/EC. The Electricity Market Directive 2009/72/EC allows member

states to enact clearly defined, transparent and non-discriminatory public service obligations on electricity undertakings on grounds of security (art. 3, par. 2). It also requires the member states to monitor security of supply issues and publish every two years a report on the results of the monitoring and on the measures taken or intended to adopt to address identified issues (art. 4). In crisis situations, the member states are allowed to take proportionate measures that disturb the internal market as little as possible. These measures must be communicated to the other member states and the Commission, which can require the member state to amend or abolish the taken measures. However, there is no harmonisation on the nature of these measures; it suffices that they are proportionate and do not distort competition or negatively affect trade. Analogously to the gas sector, Regulation (EC) No 714/2009 on conditions for access to the network for cross-border exchanges in electricity provided moreover the adoption of network codes and guidelines which in respect of electricity security resulted in the adoption of the Capacity Allocation and Congestion Management Guidelines[105], of the System Operation Guidelines[106] on the secure management of the grid, of the Balancing Guidelines[107] and of the Emergency & Restoration Code[108] for the practices the TSOs must follow in case of an incident on their grid. However, these highly technical rules for TSOs do not automatically guarantee an optimal preparation and efficient management of bigger crisis situations that embody a potential spill-over effect between the member states. Additionally, the requirement for a national risk assessment can only be implicitly found in article 4 of Directive 2009/72/EC and article 7 of Directive 2005/89/EC on the general obligation to monitor and regularly report on the security of electricity supply (Karagiannis, Chondrogiannis, Krausmann, & Turksezer, 2017, p. 7).

[105] Commission Regulation (EU) 2015/1222 of 24 July 2015 establishing a guideline on capacity allocation and congestion management.

[106] Commission Regulation (EU) 2017/1485 of 2 August 2017 establishing a guideline on electricity transmission system operation.

[107] Commission Regulation (EU) 2017/2195 of 23 November 2017 establishing a guideline on electricity balancing.

[108] Commission Regulation (EU) 2017/2196 of 24 November 2017 establishing a network code on electricity emergency and restoration.

3.2. Regulation (EU) 2019/941 on risk-preparedness in the electricity sector

On 5 June 2019, the EU adopted a Regulation (EU) 2019/941 on risk-preparedness in the electricity sector and repealed Directive 2005/89/EC. It is part of the new legislative package "Clean energy for all Europeans" presented by the Commission on 30 November 2016, a key aspect of which is the redesign of the internal electricity market towards a more flexible, more market-oriented and better prepared place to integrate a greater share of renewable energy sources. Thus, it must be considered together with the recast versions of the Electricity Market Directive (Directive 2019/944), the Regulation on the internal electricity market (Regulation (EU) 2019/943) and the ACER Regulation (Regulation (EU) 2019/942). With this new regulatory framework, the EU introduced major novelties on electricity crisis prevention and management "in a spirit of increased transparency, trust and solidarity between Member States" (recital n. 3 of Regulation (EU) 2019/941).

First of all, several different entities are now involved, which is a manifestation of its enhanced cooperative approach. Thus, the national competent authorities are required to cooperate not only with each other, but also with TSOs, Distribution System Operators (DSOs), regulatory authorities, ENTSO-E, the Electricity Coordination Group (ECG) and the regional coordination centres. The competent authority is a national body or authority (thus, it can also be the regulatory authority) that must be designated by the member states within 5 January 2020 and which cooperates with the other competent authorities. The establishment of a clear contact for each member state allows for a better coordination between the different actors. Therefore, their names and contact details must be published and regularly updated. The competent authority can, however, delegate operational tasks to other bodies, if allowed to do so by the relevant member state. The competent authority is responsible for the risk assessment on security of electricity supply, which shall take into account also the adequacy assessments requested by Regulation (EU) 2019/943[109]. Another body entrusted with important task in risk-preparedness is the Electricity Coordination Group (ECG), which was established

[109] See chapter 3, section 4.2.

by the Commission back in 2012 with the goal to facilitate the exchange of information and cooperation on cross-border measures and security of electricity supply. The group originated from several meetings of the Commission with key actors of the internal electricity market concerning the impact of increasing production of electricity from renewable energy sources on grid stability and resource adequacy. Its members are, thus, the member state's authorities, the national regulatory authorities, the European Network of Transmission System Operators for Electricity (ENTSO-E) and ACER. The ECG is chaired by a representative of the Commission and acts as a coordinative platform for the exchange of information and for cooperation on a variety of topics: electricity policy measures with cross-border impact, best practices and experiences, the design of policy initiatives and the security of electricity supply. Finally, the new Regulation considers also the regional coordination centres that have been introduced by articles 35 ff. of Regulation (EU) 2019/943 and that replace the regional security coordinates established by the System Operation Guidelines. They assist the TSOs in carrying out the tasks of regional relevance and act independently from any member state's and TSO's interests. Thus, the implementation of the legal regime on risk-preparedness is based on a multi-level approach that requires joint efforts of all these different entities.

Articles 5 to 9 of Regulation (EU) 2019/941 harmonise the identification of risk scenarios and assessments, differentiating between several types:

(1) regional electricity crisis scenarios elaborated by ENTSO-E in collaboration with the ECG and the competent authorities for each region of the EU that must be submitted to the relevant TSOs, regional coordination centres, competent authorities, regulatory authorities and the ECG; the ECG can also request amendments. They must be updated at least every four years. The term "region" coincides with the area of competence of the respective regional coordination centre, but until the establishment of these centres, it refers to a group of member states that are located in the same synchronous area.

(2) national electricity crisis scenarios identified by the competent authority after consulting with TSOs, DSOs, the relevant producers and the regulatory authority where it does not coincide with the competent authority; since this must be done

within four months of the identification of the regional crisis scenario, consistency with the latter is required. They also have to be regularly updated at least every four years. Moreover, in the same time period the ECG and the Commission must be informed of the assessment of risks regarding the ownership of relevant infrastructure, of the measures taken to prevent or mitigate these risks explaining why they are considered necessary and proportionate.

(3) short-term adequacy assessment carried out by the regional coordination centres;

(4) seasonal adequacy assessment elaborated by ENTSO-E.

The identification of crisis scenarios and the establishment of the adequacy assessments must be based on two harmonized methodologies to be proposed within 5 January 2020 by ENTSO-E and submitted for approval to ACER. Based on these scenarios, every competent authority must elaborate a risk-preparedness plan. Its establishment procedure involves a consultation phase with DSOs, TSOs, electricity and gas undertakings and relevant organisations that represent the interests of electricity customers. Before adopting the plan, however, the draft plan must be sent to the competent authorities of the other member states in the same region or which are directly connected and the ECG. The competent authorities and the ECG can thereafter submit suggestions on the draft plan within six months. After another three months, the final plan can be adopted and published. The first set of plans is required to be published by 5 January 2022 with regular updates of at least every four years.

Regulation (EU) 2019/941 provides that the risk-preparedness plans contain three different types of clearly defined, transparent, proportionate and non-discriminatory measures to prevent, prepare for and mitigate electricity crises. Regional measures have to be agreed on by all member states of the same region that can offer cooperation and assistance to each other. Bilateral measures are, on the contrary, optional and are taken by the member states that are directly connected but part of different regions. Finally, the national measures have to take into account the regional and bilateral measures and must not endanger operational security, the safety of the transmission system and the

security of electricity supply of other member states. In the agreement procedure on regional and bilateral measures the Commission can facilitate the negotiations and ask ACER and ENTSO-E to assist the member states. If the relevant member states cannot agree on the measures, the Commission must be informed, in which case the latter submits a proposal and suggests a cooperation mechanism to facilitate the conclusion of an agreement. However, it is unclear what happens if an agreement can still not be reached. The proposal does, in fact, not seem to be binding, given the absence of a provision in this sense. Thus, a permanent blockage on the issue cannot be ruled out. The prevention or mitigation of a supply crisis should be managed with market-based measures that comply with the rules on the internal electricity market and on system operations. Only as a last resort non-market-based measures may be introduced, provided they do not unduly distort competition and the effective functioning of the internal electricity market.

The Commission assesses the adopted risk-preparedness plan within four months and takes into account the ECG's opinion for this purpose. Consequently, it issues an opinion on the plan if it considers it inadequate or faulty. More specifically, this covers the following situations:

(1) the plan is ineffective for mitigating the identified risks;
(2) the plan is inconsistent with crisis scenarios or plans of another member state; however, this criterion should be interpreted in a restrictive manner. In fact, it appears reasonable to require that the plan is consistent with the scenarios and plans of the member states that are part of the same (and maybe also the neighbouring) region or that are directly connected with the relevant country. It seems, in fact, too burdensome to demand consistency with any potential member state;
(3) the plan was not adopted according to the procedure laid out by the Regulation;
(4) the plan unduly distorts competition or the effective functioning of the internal market or is in any case inconsistent with EU law.

The Commission's opinion is non-binding, meaning that the relevant member state is free to review its plan or to object stating its reasons for the disagreement. In the latter

case, the Commission can withdraw the opinion or meet up with the competent authority and the ECG. However, the final decision is in the hands of the competent authority, which can refuse any review of the plan stating the reasons for its position.

Unlike Regulation (EU) 2017/1938 on security of gas supply which foresees three crisis levels (early warning, alert, emergency), article 14 of Regulation (EU) 2019/941 only sets out two levels: early warning and emergency. The declaration of any of those crisis levels sets a communicative procedure in motion, throughout which the competent authorities of the member states of the same region or the ones that are directly connected and the Commission are duly informed about the causes and reasons for the declaration.

Article 15 introduces a solidarity mechanism that requires the member states to "act and cooperate in a spirit of solidarity in order to prevent or manage electricity crises". For this purpose, the member states activate the regional or bilateral measures they agreed on in their respective risk-preparedness plans. Furthermore, it is required that technical, legal and financial arrangements for the implementation of these measures be taken. If no such arrangements have been made, the relevant member states must agree on *ad hoc* measures and arrangements. The assisting member state is entitled to fair and immediate compensation that must cover the cost of the delivered electricity and any other reasonable cost the assisting member state incurred, such as the reimbursement of prepared but not activated assistance, the costs resulting from judicial or arbitration proceedings and settlements, the costs incurred from an obligation to pay compensation by virtue of fundamental rights guaranteed by Union law and by virtue of the applicable international obligations when implementing the provisions of this Regulation on assistance, and further reasonable costs incurred from the payment of compensation pursuant to national compensation rules. In fact, it is possible that due to the assistance some undertakings are not able to provide their customers with the contracted electricity, which thus can initiate legal claims for compensation against the assisting member state. By 5 January 2020, the Commission will adopt non-binding guidelines on the elements to be included in the technical, legal and financial arrangements and on the principles of mutual assistance. As such, this provision appears to be very similar to

the solidarity mechanism encountered in the context of security of gas supply[110]. However, there are some fundamental differences:

(1) the mechanism set out by this provision is not a measure of last resort, but appears to be an ordinary procedure that must be enacted every time the adoption of a regional or bilateral measure becomes necessary;
(2) the mechanism is based on regional and bilateral measures that are already implemented in the risk-preparedness plans;
(3) it is less restrictive in terms of conditions that need to be fulfilled in order to successfully activate the mechanism;
(4) there is no burden-sharing mechanism, according to which the member state must choose the most advantageous offer on the basis of cost, speed of delivery, reliability and diversification of supplies;
(5) there are less possibilities for member states to refuse assistance; in fact, the only possibility is to not agree on any regional measures and to refuse *ad hoc* agreements in case of a crisis; however, in such a case the intention of the member state will be very apparent if no legitimate reasons for such a refusal exist.
(6) there are no "solidarity protected customers" that have to be guaranteed, due to the overall importance of electricity in every aspect of human life.

Moreover, the provision is not entitled "solidarity mechanism", but "cooperation and assistance"; although this fact may seem just aesthetical, it does cause some perplexity. Why is the EU after the introduction of an explicit solidarity mechanism in the context of gas supply in 2017 taking a step back on the principle of solidarity? It is plausible to think that the unenthusiastic implementation of the solidarity mechanism of Regulation (EU) 2017/1938 had a chilling effect on further formally endorsing the principle of solidarity as an operational right. The Commission might have also tried to mask the fact that this mechanism is stricter in nature and in application to gain more consent among the member states. Whatever the reason may be, this approach is indeed very interesting and must be considered as a signal on the future handling of the principle of

[110] See chapter 2, section 3.3.

energy solidarity as disguised tool.

Lastly, Regulation (EU) 2019/941 provides an *ex post* evaluation of the crisis management. In fact, within three months of the end of an electricity crisis, the competent authority of the member state that declared the crisis must submit an evaluation report to the Commission and the ECG that covers the details set out in article 17. This is particularly important, as it allows the EU and the member states to learn from mistakes made and to improve future preparation and management of a supply crisis.

Thus, the new framework is another effort in strengthening mutual trust and solidarity within the EU in the event of a supply crisis, specifically with regard to electricity. By harmonising the methodology for risk assessment and plans, highlighting coordination and the regional dimension in the preparedness plans, involving all the various actors, implementing a solidarity mechanism and providing for an *ex post* evaluation, Regulation (EU) 2019/941 represents a real improvement in addressing electricity crises on an EU-wide basis. It remains to be seen whether the implementation will proceed as prospected or will once more be frustrated by unenthusiastic member states.

4. Capacity mechanisms

4.1. The national distrust in the internal electricity market

Throughout the past sections, the fact that the EU approach is based on the assumption that the internal energy market represents the most efficient way to ensure an adequate level of energy security has emerged several times. However, in the dimension of electricity network reliability, this circumstance collides in the most visible way with a strong protectionist attitude by the member states. Electricity is a cornerstone of modern society and plays a significant part in national politics, as blackouts and high prices can upset the electorate very quickly. Thus, an essential part of national energy security policies is the elimination of any external factors that could undermine the stability of the electricity grid. The EU internal electricity market, however, “requires a willingness on the part of Member States to relinquish their energy independence in

exchange for the promise of greater competition, greater efficiency and, hence, lower prices" (Huhta, 2018, pp. 920-921). The big challenge is therefore the step from independence to interdependence among the member states.

It is worth mentioning that the electricity market as designed by Directive 2009/72/EC is not a pure energy-only market. Even though it is expected to deliver the right price signals to incentivize all the necessary investments in infrastructure, the rules provide several exceptions for reasons of security of supply from the general rule according to which the member states have to authorise the construction of new generating capacity following objective, transparent and non-discriminatory criteria (art. 7). These exceptions included:

(1) the imposition of public service obligations (art. 3);
(2) a tendering procedure for new capacity where the measures taken by the general authorisation procedure cannot provide the needed capacity (art. 8);
(3) a limited priority access for the dispatch of generating infrastructure using indigenous primary energy fuel sources (art. 15, par. 4);
(4) the adoption of temporary safeguard measures in case of a sudden crisis in the energy market and where the physical safety or security of persons, apparatus or installations or system integrity is threatened (art. 42).

However, the challenges of the energy transition[111] have given the member states doubts on the capability of the internal electricity market to ensure resource adequacy in the medium-long term[112]. As a consequence, these economic, technical and political drivers (Hawker, Bell, & Gill, 2017) led to a widespread introduction of capacity mechanisms.

A capacity mechanism is a "measure taken by a state designed to support investment to fill an expected capacity gap and ensure security of supply" (Hawker, Bell, & Gill, 2017, p. 53), which consists in "offering producers compensation for [maintaining or investing in] capacity in addition to the market-based remuneration for electricity" (Huhta, 2018, p. 924). The functioning and design of capacity mechanisms can be very different. Thus,

[111] See chapter 3, section 1.

[112] In fact, the "missing money problem" was the most important reason to introduce capacity mechanism in most member states (Szulecki & Kusznir, 2018; Leiren, Szulecki, Rayner, & Banet, 2019).

several types can be distinguished (table 7)[113]. However, the compatibility of such capacity mechanisms with the internal electricity market has been questioned for several reasons. Capacity mechanisms had not been foreseen in the design of the internal electricity market, thus every member state put its own model into place without any coordination whatsoever. Furthermore, the consistency with fundamental EU rules, such as the prohibition of state aid and the free movement of goods (Oliver,

Table 7: Main and sub-types of capacity mechanisms and their functioning

Targeted mechanisms	concern only the additional capacity required on top of that provided by the market;
strategic reserves	capacity is held outside the market and activated in an emergency;
tenders for new capacity	benefit only new investment projects;
price-based capacity payments	a subset of capacity (for ex. a specific technology type) is paid a price set by a central body;
demand-response or interruptibility schemes	remunerate exclusively demand response operators;
Market-wide mechanisms	benefit all market participants that are required to meet the declared level of security of supply desired by the government (reliability standard);
central buyer models	the required capacity is set and sold at a central bidding process;
decentral obligation schemes	market participants are obliged to contract the necessary capacity to cover their demand;
capacity payments	a fixed price for capacity is paid to all market participants;

[113] See Report from the Commission, Final Report of the Sector Inquiry on Capacity Mechanisms, COM(2016) 752 final, 30 November 2016, p. 9.

2015), can be doubted. Compliance with the latter was a particular issue as in many cases the participation of foreign capacities was forbidden or the relevance of imports was neglected in calculating the needed capacities. More importantly, though, capacity mechanisms may have several negative impacts on cross-border trade of electricity and, thus, on the security of electricity supply in the Union. Firstly, they distort the price signals so that they no longer reflect the cost of production and scarcity of capacity, thus unduly affecting investment decisions. Secondly, the compatibility with the principle of equal treatment is questionable. Beneficiaries of capacity mechanisms enjoy a modification of competitive opportunities in their favour, since generators in neighbouring markets will struggle to compete on an equal footing.

Thus, the different functioning of the mechanisms leads in practice to discrimination between electricity generators depending on which member state they are producing in. Other impacts concern the decrease of peak prices, a shift in investments leading to an inefficient excess of capacity-construction in member states with capacity mechanisms at the expense of needed investments in neighbouring markets and consequences on welfare (Hawker, Bell, & Gill, 2017, pp. 55-56). For these reasons, the Commission initiated a State Aid Sector Inquiry in 2015[114] which was concluded in 2016. The final report[115] confirmed that capacity mechanism must correctly reflect the scarcity of capacity by allowing the markets to set the price for capacity. Hence, price-based mechanisms are generally unsuitable and conflicting with the nature of the internal electricity market. Moreover, the distortive effects on cross-border trade can mostly be avoided by creating a level playing field between the different capacity providers. For this purpose, a high degree of competition with an open and competitive process must be established.

[114] Commission Decision from 29 April 2015 initiating an inquiry on capacity mechanisms in the electricity sector pursuant to Article 20a of Council Regulation (EC) No 659/1999 of 22 March 1999, C(2015) 2814 final.

[115] Report from the Commission, Final Report of the Sector Inquiry on Capacity Mechanisms, COM(2016) 752 final, 30 November 2016.

4.2 Capacity mechanisms in Regulation (EU) 2019/943 on the internal electricity market

At the same time, the Commission proposed harmonized rules on capacity mechanisms in its "Clean energy for all Europeans" package of 30 November 2016. These were eventually adopted in Regulation (EU) of the European Parliament and of the Council of 5 June 2019 on the internal market for electricity, which enters into force on 1 January 2020. Chapter IV (art. 20-27) of the new Regulation sets out clear and strict principles on the introduction and design of capacity mechanisms, characterizing them as necessarily temporary measures[116] of last resort that may only be used to counter resource adequacy concerns.

Resource adequacy concerns are identified by the European resource adequacy assessment, which is carried out by ENTSO-E on a transparent methodology to be submitted to the ECG and ACER within 5 January 2020. The member state can also conduct a national resource adequacy assessment based on the same methodology to complement the European one. If the national assessment identifies additional adequacy concerns, the member state must state the reasons that lead to the difference, publish the assessment and submit it to ACER. The latter issues an opinion within two months, which must be taken into account by the responsible national body. Where the national body disagrees with ACER's opinion, it must publish a detailed report on the matter. When resource adequacy concerns emerge from the assessments, the member states must identify the causing or contributing factors and eliminate them on the basis of an implementation plan that provides the appropriate measures. The implementation plans must be based on the general principles of the internal electricity market *ex* article 3, feature a timeline for the adoption of the measures contained therein and consider, *inter alia*, removing regulatory distortions, price caps and regulated prices, and increasing interconnection and internal grid capacity. The Commission reviews the suitability of the implementation plan within 4 months and can demand amendments to

[116] Article 2(22) of Regulation (EU) 2019/943 reads that "'capacity mechanism' means a temporary measure to ensure the achievement of the necessary level of resource adequacy by remunerating resources for their availability, excluding measures relating to ancillary services or congestion management".

it. It is also regularly informed about the implementation of the plan on the basis of yearly reports from the member state and issues an opinion on the sufficiency of the implementation and on whether the adequacy concern has been resolved. In any case, the implementation plan must be followed by the member state even after all the identified concerns have been resolved.

Capacity mechanisms, however, may only be introduced as a last resort when the identified adequacy concerns cannot be resolved by the elimination of regulatory distortions or market failures. For this purpose, member states must wait for the Commission's opinion on the implementation plan before introducing a capacity mechanism and carry out a comprehensive study on its potential effects on the neighbouring member states, consulting with the latter and relevant stakeholders. The Regulation gives clear priority to strategic reserves. Only when these are expected to be incapable of addressing the relevant adequacy concerns, another mechanism type may be introduced. Where a capacity mechanism has been introduced, the member state must regularly review its functioning and initiate a phase-out if subsequent adequacy assessments no longer identify an adequacy concern. A phase-out must also be foreseen for mechanisms through which no new contracts are concluded for three consecutive years. Capacity mechanisms must comply with the treaty rules on state aid (art. 107-109 TFEU) and, thus, be approved by the Commission. Given their temporary nature, their maximum duration is limited to 10 years. Article 22 requires that certain design elements are satisfied. In fact, every mechanism must be temporary, not create undue market distortions and not limit trade, be proportionate to the adequacy concerns, choose the capacity providers in a transparent, non-discriminatory and competitive manner, provide incentives for the availability of the providers in stressful situations, set out the required technical conditions, be open to all resources that can provide the required technical performance and provide appropriate penalties for providers that are not available in times of system stress. Moreover, the price for capacity must decrease with increasing supply of capacity towards the demanded level, remuneration has to be referred to the providers' availability and must not affect generation decisions, and capacity obligations must be transferable. This second set of requirements obviously cannot apply to

strategic reserves, which are placed outside the market. For them, however, additional special characteristics must be respected. In fact, they may only be dispatched if the TSO is likely to exhaust its possibilities to balance demand and supply and they cannot receive remuneration from the wholesale market and the balancing market. Furthermore, capacity mechanisms are required to connect to the climate change paradigm by contributing to the decarbonisation of the EU energy system. Article 21, par. 4 sets specific CO^2 emission limits according to which generation capacity that emits more than a certain amount of CO^2 originating from fossil fuels per kWh and year is no longer allowed to participate in the capacity mechanism. The member states are, however, allowed to set their own desired level of security of supply by establishing a transparent reliability standard. The standard is proposed by the national regulatory authority and must be based on the methodology developed by ENTSO-E.

Finally, Regulation (EU) 2019/943 requires cross-border participation in capacity mechanisms. Thus, foreign capacities that can provide an equivalent technical performance to domestic capacities must be able to participate in the same competitive process. However, the member state applying the capacity mechanism can require that the foreign capacity is located in another member state which is directly connected to it. The member states can neither prevent domestic capacity to participate in capacity mechanisms of other member states, nor limit the number of capacity mechanisms capacity providers can participate in. Participation in several mechanisms for the same delivery period will be limited to the expected availability of interconnection and the likely concurrence of system stress between the relevant systems. If the provider's capacity is not available, it must be required to make a non-availability payment. Failed fulfilment of several commitments due to participation in more than one capacity mechanism lead to multiple payments. The regional coordination centres recommend to the TSOs the maximum entry capacity available for participation of foreign capacity. The revenues arising through the allocation of the entry capacity is shared between the relevant TSOs. If only one of the two interconnected member states applies a capacity mechanism, the share of revenues is approved by the competent national authority. Lastly, cross-border participation must be organised in an effective and non-

discriminatory manner. The regulatory authorities must ensure adequate administrative arrangements for the enforcement of non-availability payments across borders.

Thus, these new rules ensure that the internal electricity market does not experience any distortions or undue alterations from the introduction or functioning of capacity mechanisms. Effective cross-border cooperation and the non-discrimination between domestic and foreign providers and different energy sources that are capable to achieve the required reliability standard for the supply of capacity are the main tools for this purpose. With respect of the existing capacity mechanisms, they must be conformed to the new rules. However, it is important that the EU further addresses the internal electricity market failures in order to ensure sufficient generation adequacy for the years to come. In this manner, the introduction of new innovative policy tools by the member states that were not considered by the regulatory framework and that embody potential distortions of the electricity market can be prevented.

5. National incentives to ensure continuity of electricity supply: reward and penalty schemes and single-user compensation mechanisms

Starting from 2000, many member states have also designed and implemented so-called "reward and penalty schemes" (RPS) to strengthen the electricity network reliability (Fumagalli & Lo Schiavo, 2009). RPS are a technical aspect of the more general framework on service quality regulation and incentivize the promotion of quality improvements in respect of continuity of supply by "modify[ing] the company revenues according to its performance" (Fumagalli, Lo Schiavo, & Delestre, 2007, p. 65). Their basic structure is twofold and consists in the identification of performance standards and in the application of monetary rewards and penalties to the relevant addressees when exceeding or failing to meet these standards (fig. 7). If the level of performance coincides with the set standard, there is neither a reward nor a penalty (so-called dead zone). The penalties usually consist in administrative sanctions. The level of the performance standards and of the rewards and penalties generally reflect customer preferences of

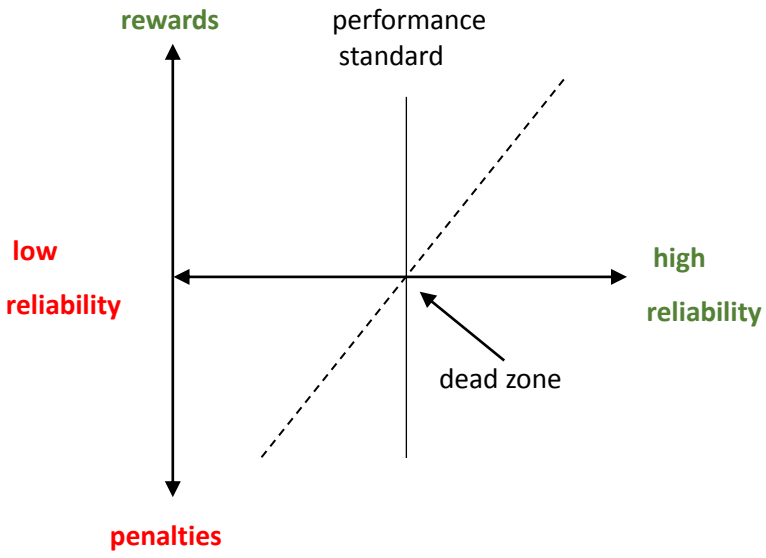
quality. To ensure non-discrimination and equal treatment, however, the relevant data must be collected in a regulated manner according to clear and transparent rules. Consequently, "[i]f the bonuses and penalties presented to the firm closely approximate the marginal benefits and costs to consumers of increases and decreases in quality, a profit-maximizing regulated firm will expand quality to the point where the marginal benefit of additional quality to consumers (and thus the firm's marginal reward) equals the firm's marginal cost of increasing quality" (Sappington, 2005, p. 134). Thus, by linking consumer costs to their own, transmission and/or distribution system operators are stimulated to improve their performance reliability on the grid. Moreover, the level of performance standards can be changed over the years, obliging them to progressively meet stricter standards.

Reward and penalty schemes can be designed in different ways. Sumesh (2016) identifies three main types:

(1) the linear scheme, where the relationship between quality and reward/penalty is perfectly proportional;

(2) the capped scheme, where rewards and penalties are capped at a certain point to reduce the risk of exceedingly high sums; this type is usually introduced when the regulator has unreliable information about interruption costs and willingness

Figure 7: General structure of a linear reward and penalty scheme



Source: Fumagalli & Lo Schiavo, 2009, p. 9; Sumesh, 2016, p. 110.

to pay of the customers.

(3) the dead band scheme, where the dead zone is extended to a bigger interval in which “rewards and penalties do not have any significant bearing and are intended to maintain a strategic distance, to avoid tariff variations for little deviations from the baseline” (p. 113); it can also be combined with the capped scheme.

The implementation of such schemes, however, is not simple and depends on “the specific industrial and institutional factors of each country, as well as […] national priorities and objectives” (Fumagalli & Lo Schiavo, 2009, p. 3). Furthermore, the indexes used to determine the performance standard can differ greatly and stem from performance over time to mathematical calculations (Grahn, et al., 2016, p. 2).

Common indicators for benchmarking the system performance are, for example, Energy Not Supplied (ENS), Average Interruption Time (AIT), System Average Interruption Duration Index (SAIDI), Customer Average Interruption Duration Index (CAIDI), System Average Interruption Frequency Index (SAIFI) and Momentary Average Interruption Frequency Index (MAIFI) (CEER, 2016).

The regulation of reward and penalty regimes of EU member states is monitored by the Centre for European Energy Regulators (CEER). The results are regularly published every two years in its Benchmarking Report on the Quality of Electricity and Gas Supply. CEER is a non-profit association that was established in 2000 by national regulatory authorities. As such, it is not a body of the European Union, although it works in close cooperation with ACER. Its goal is to “facilitate the creation of a single, competitive, efficient and sustainable internal market for gas and electricity in Europe” by complementing the activities of ACER and providing a “platform for cooperation, information exchange and assistance between Europe's national energy regulators” (CEER, 2019). The latest report on RPS in the electricity sector of the EU member states from 2016 highlights a great variety in approach. In fact, while most countries adopted a full reward and penalty scheme, some member states employed a reward-only or

penalty-only scheme[117] (table 8). Moreover, most schemes only apply to the distribution network and nine of the surveyed countries did not introduce any scheme at all. There are also big differences in the design of applicable schemes. Some RPS only apply to a certain group of network operators (for example, the German one only applies to low and medium voltage level DSOs), others exclude from their application events which cannot be influenced by the system operators (for example, the Czech one) and others again consist in price cap (Lithuania) or dead band (Portugal) models, or are even completely flexible (Slovenia).

Table 8: RPS in EU member states

Relevant network	Distribution	Transmission
Reward-only		BE, ES
Penalties-only	DK, HU	HU
Full RPS	BG, CZ, DE, ES, FI, FR, GB, IE, IT, NL, PT, SI, SE	DE, FI, FR, IE, IT, PT, SE
No scheme	AT, CY, EE, EL, LT, LU, MT, PL, SK	

Another way to incentivize improvements in grid reliability is a compensation mechanism on single-user level. The network operator that fails to meet the predetermined performance standard is obliged to pay a certain monetary sum to the single customer that was affected by the supply interruption. According to CEER (2016), almost two thirds of the surveyed countries offered such compensation. The requirements that must be satisfied to trigger the mechanism can be very different and depend on the connected capacity, voltage level or weather. Thus, relevance is given to the individual duration of long unplanned interruptions, or the total duration or total number of interruptions per year. Most countries that employ such a mechanism also provide automatic compensation. The level of compensation can be based on the yearly network tariffs, customer surveys, international comparison, the estimated costs of interruptions or the energy cost during the single interruption.

[117] Such schemes can be considered special capped RPS, as either the rewards (for penalty-only schemes) or penalties (for reward-only schemes) are capped at zero.

As can be seen, even though incentive mechanisms have significantly improved the reliability of the electricity grid “at an extremely low cost for consumers” (Fumagalli & Lo Schiavo, 2009, p. 2) and are used in most EU member states, there is a significant lack of harmonisation. Continuity of supply is assessed using very different indicators and data collecting procedures. The RPS performance standards are set according to different formulae and have a different area of application, while single-user reimbursements are based on different triggers and levels of compensation. This leads to a considerably diverse treatment of network operators and electricity consumers across the European Union. Thus, CEER recommends more harmonisation in all of these aspects. So far, however, this issue has been of little interest to the EU policymakers and no concrete measures have been proposed. As long as such mechanisms are not applied in a discriminatory manner to TSOs or DSOs controlled by another member state and do not unduly distort trade in the internal energy market, it is, in fact, unlikely that an intervention by the EU will happen any time soon.

CHAPTER 4: CLIMATE RESILIENCE

1. Climate change as an energy security problem

1.1. Climate change impacts on the energy sector

Climate change is the "greatest challenge humans have ever faced" (Davies, 2019) and will have a lasting effect on every aspect of our modern lifestyle. It is expected to increase the frequency and intensity of extreme weather events and changes in weather patterns. These consequences will as well affect all the segments of the energy supply chain (generation, transmission, distribution and supply) in respect of both infrastructure assets and levels of productivity (Forzieri, et al., 2018). Although the exact impacts of environmental hazards are difficult to predict, analyse and quantify (Linkov, et al., 2014) due to their diversity, complexity and interconnectivity (Hutter, 2017), some general observations can nonetheless be made. Thus, an increase in temperature with more frequent and more intense extreme-heat periods affects the extraction activities of fossil fuels and leads to an expansion of oil and natural gas in pipelines reducing their capacity, lowers efficiency and energy output of renewable power plants, decreases the capacity of the electricity transmission grid, increases electricity losses, lowers electricity power plant efficiency due to high water temperatures and fosters spontaneous combustion of coal stocks. Extreme precipitation, on the one hand, including snowfall affects hydropower output and generation due to changes in water flows and water levels, decreases the energy yield of biomass and coal and leads to erosion and damage on transmission and distribution infrastructure. Decreasing precipitation, on the other hand, is expected to alter drilling, production and refining activities of fossil fuels, decreases both the energy output of hydropower plants and the available amounts of biomass, reduce electricity generation and damage the transmission and distributions grid. Sea level rise is a serious threat to offshore and coastal energy infrastructure and increases the impacts of storms on the inland. Extreme weather events – such as floods, storms, cold snaps and hurricanes – are more likely to destroy infrastructure and to

interrupt energy supply and fossil fuel transportation. Finally, wildfires reduce electricity transmission capacity and can lead to blackouts due to smoke and ash (Mikellidou, Shakou, Boustras, & Dimopoulos, 2018).[118] In this context, the resulting changes in regional and seasonal consumption patterns with a higher probability of sudden extreme peaks in energy demand represent one of the most crucial challenges. Furthermore, it must be noted that "[d]ifferent types of infrastructures have different levels of vulnerability to climate change [and] different hazard exposures" (Forzieri, et al., 2018, p. 97) due to the fact that the impacts of climate change are unequally distributed throughout the EU.

Climate change affects the energy sector already in the present and is no longer merely a problem of the (near) future. In fact, the 2018 and 2019 heat waves in Europe led to shutdowns and energy output reductions of almost 10% of thermal power stations and hydropower plants in many parts of the EU due to the fact that the river temperatures were too high to effectively cool the systems and because water levels were considerably lower than usual[119] (Schultz & DPA, 2018; ORF, 2018; Morison, 2018; Reuters, 2019b). Even though these curtailments can – for the time being – eventually still be offset by higher precipitations in other periods of the year, the intensity of such weather changes complicates balancing operations and leads to temporary energy price shocks. It is thus important to ensure that the existing energy system can withstand and adapt to the impacts of climate change, i.e. to render it climate resilient, even more so when considering that many of these impacts will be felt even after mitigation efforts will have shown a significant contribution in lowering the emission of greenhouse gases into the atmosphere, due to the fact that greenhouse gases are capable to remain in the atmosphere for centuries (Osofsky & McAllister, 2012, pp. 39-40; Wold, Hunter, & Powers, 2013, p. 8).

[118] A detailed list of potential climate change impacts on energy infrastructure can be found in Mikellidou, Shakou, Boustras, & Dimopoulos, 2018, pp. 113-114.

[119] The interdependence between water and electricity generation is also referred to as "water-energy nexus" (Vliet, van, Wiberg, Leduc, & Riahi, 2016; Behrens, Vliet, van, Nanninga, Walsh, & Rodrigues, 2017) and is an emergent subject of climate change and energy security studies due to the expected future growth in electricity demand in the context of global warming.

1.2. The concept of climate resilience

Resilience is a rather recent term and, as such, has not yet gained a commonly accepted definition (Panteli & Mancarella, 2017). It emerged in the late 1960s as part of environmental law studies and "has become increasingly prominent in the 21st century as a strategy for disaster risk reduction" (Hutter, 2017, p. 20). Among the many different approaches in scholarly literature, however, some core elements constantly emerge which summarise resilience as "ability to [prepare,] absorb, adapt to and/or rapidly recover from a potentially disruptive event" (Ganguly, Bhatia, & Flynn, 2018, p. 23). Resilience is therefore a multidimensional concept (Hutter, 2017; Opdyke, Javernick-Will, & Koschmann, 2017; Ganguly, Bhatia, & Flynn, 2018; Mikellidou, Shakou, Boustras, & Dimopoulos, 2018) that consists in:

(1) anticipative capacity, i.e. the ability to appropriately prepare and plan the mitigation of a disruptive event's impacts;
(2) absorptive capacity or robustness/resistance/strength, i.e. the ability to resist or absorb the impact of a disruptive event with little to no divergence from normal operation performance;
(3) adaptive capacity or resourcefulness, i.e. the ability to review and learn from operation performance during past disruptive events and to improve by re-organisation and transformation to satisfy the new required level of performance;
(4) restorative capacity or rapidity/recoverability, i.e. the ability to quickly resume normal operation performance at a low cost when a disruptive event has occurred.

Hence, resilience presents characteristics that ontologically differentiate it from mere infrastructure protection, which is limited to the prevention and mitigation of the impacts that are caused by a disruptive event to infrastructure and delineates therefore an aspect of absorptive capacity, and network reliability, which concerns the daily operations under ordinary conditions[120]. Resilience is based on a long-term approach

[120] See also chapter 3, section 1.

with the ultimate objective to successfully cope with any future hazardous event that may hypothetically occur according to a reasonable degree of probability. In this context, climate resilience is a *species* of resilience that focuses on the adverse environmental consequences of climate change. It complements and adds to common risk management of environmental threats[121] and must take into account the relevant increasingly interconnected social, technical and economic aspects, the uncertainties concerning the specific vulnerabilities of them and the unpredictability of climate change impacts (Linkov, et al., 2014).

The legal dimension is significant on this matter, as it can establish a principled foundation and essential vehicle (McDonald, 2011) for change by obliging system and infrastructure operators to engage in resilience strategies and by identifying the criteria and minimum requirements based on which a certain level of resilience must be reached. Due to the fact that the transformation of systems needed to render them climate resilient requires enormous costs, the necessary investments must be enabled and incentivized. Moreover, resilience regulation is linked to the more general adaptation policies in international and EU law. In fact, according to McDonald (2011), "responsiveness, robustness, and accountability of a legal system – encompassing formal and informal rules and the agencies responsible for their design and implementation – will influence the timeliness and effectiveness of climate change adaptation strategies" (p. 283).

[121] For a short summary on scholarly discussions about the relationship between risk management and resilience see Hutter, 2017, pp. 21-24. For the purpose of this chapter, it suffices to mention that risk analyses are usually employed where the risks are known and foreseeable in a calculable way, while a resilience approach is commonly deemed more suitable where there is a high degree of uncertainty. In any case, it appears reasonable to consider them complementary to one another, as they both aim to "enhance the ability of the system to cope with the risks and hazards with which it is confronted" (Hutter, 2017, p. 23).

2. A fragmented legal framework

Currently, there is no specific holistic strategy on climate resilience for the energy sector in EU law. In fact, the EU Energy Security Strategy[122] only generally talks about prioritizing the improvement of resilience to sudden supply disruptions by preparation, planning and protecting strategic infrastructure, while the Framework Strategy for a Resilient Energy Union[123] approaches the issue merely from the perspective of preventing or mitigating climate change itself rather than focusing on its disruptive impacts. Hence, there is not a comprehensive legal act on the matter either. Only the EU Strategy on adaptation to climate change from 2013[124] contains general references to promoting adaptation in the energy sector via the development of standards for more climate resilient infrastructure and through the promotion of investment and business decisions in climate resilience. Thus, a high degree of legislative fragmentation can be observed, with the presence of climate-resilient aspects in several different sector-specific acts.

Council Directive 2008/114/EC of 8 December 2008 establishes a procedure for the identification and designation of European critical infrastructures (ECI) and harmonises the risk assessment for the protection thereof in the sectors of energy and transport. A European critical infrastructure is defined by article 2 as an asset, system or part thereof in a member state that is essential for the maintenance of vital societal functions and the disruption or destruction of which would have a significant impact on at least two member states. The significance of the cross-border impact is determined by specific criteria on casualties, economic effects and public effects. The designation of ECIs is competence of the member state in the territory of which they are located and based on an agreement with those member states that may be significantly affected by such a designation. Consequently, an operator security plan (OSP) or equivalent measure is

[122] Communication from the Commission to the European Parliament and the Council, European Energy Security Strategy, COM(2014) 330 final, 28 May 2014.

[123] Communication from the Commission to the European Parliament, the Council, the European Economic and Social Committee, the Committee of the Regions and the European Investment Bank, A Framework Strategy for a Resilient Energy Union with a Forward-Looking Climate Change Policy, COM(2015) 80 final, 25 February 2015.

[124] Communication from the Commission to the European Parliament, the Council, the European Economic and Social Committee and the Committee of the Regions, An EU Strategy on adaptation to climate change, COM(2013) 216 final, 16 April 2013.

required to identify the critical assets and to provide the measures that must be implemented to solve the related security concerns. Security Liaison Officers and European critical infrastructure protection contact points must be established to guarantee coordination between the owner/operator of the ECI and the member state and with the other member states and the Commission, respectively. Regular reports on the national assessment of risks, threats and vulnerabilities must be transmitted to the Commission.

Regulation (EU) No 347/2013 on trans-European energy infrastructure (TEN-E measure)[125] requires that the evaluation of the criterion "security of supply" for the designation of electricity infrastructure as Project of Common Interest takes into account "expected changes in climate-related extreme weather events and their impact on infrastructure resilience" (Annex VI, par. 2(c)).

As regards anticipative capacity, the EU asks that environmental hazards are taken into account in the planning stage and assessment of risks. Thus, Regulation (EU) 2017/1938 on security of natural gas supply[126] provides a set of environmental risk factors that must be taken into account when carrying out the common and national risk assessments (art. 7, Annexes IV and V). The list is non-exhaustive and includes earthquakes, landslides, floods, storms, avalanches, extreme weather conditions and fires. Similarly, Regulation (EU) 2019/941 on risk-preparedness in the electricity sector[127] provides that "rare and extreme natural hazards" are included in the minimum risks that the methodology for identifying regional electricity crisis scenarios must cover (art. 5). Likewise, the methodology for short-term and seasonal adequacy assessments must cover "severe weather conditions" (art. 8). Moreover, recital n. 14 explicitly includes "extreme weather conditions" as risks that must be identified in the regional electricity crisis scenarios.

In respect of funding, Regulation (EU) No 1303/2013 on the European Structural and Investment Funds and Regulation (EU) No 1316/2013 on the Connecting Europe Facility condition the access to funds to environmental factors and the promotion of climate change adaptation. Moreover, Council Regulation (EU, Euratom) No 1311/2013 provides

[125] See also chapter 2, section 4.2.8.
[126] See also chapter 2, section 3.2.
[127] See also chapter 3, section 3.2.

that at least 20% of the multiannual financial framework for the years 2014-2020, i.e. € 206 billion, is spent on climate mitigation and adaptation efforts. In May 2018[128], the Commission proposed to raise this expenditure to 25%, i.e. €320 billion, of the long-term budget for the period 2021-2027.

Finally, in 2014[129] the Commission requested the European standardization organisations CEN (European Committee for Standardization), CENELEC (European Committee for Electrotechnical Standardization) and ETSI (European Telecommunications Standardisation Institute) to systematically approach climate change adaptation in European standardisation and to identify, revise and introduce European standards to enhance the climate resilience of infrastructures.

In research and information-sharing, the European climate adaptation platform Climate-ADAPT, a collaboration between the European Commission and the European Environment Agency (EEA), provides knowledge on climate change adaptation strategies and studies. Further research and innovation on the matter is supported by the Horizon 2020 programme and the Commission's Joint Research Centre (JRC).

Thus, the current legal framework of the EU on climate resilience appears ill-equipped to face the complex challenges of climate change. So far, the fragmented spot interventions do not go beyond initial risk assessment, standardization and funding, leaving robustness, adaptive capacity and recoverability mostly uncovered and to the initiative of the member states. Considering that climate resilience of the energy sector is a very recent topic which requires more scientific and economic research, the EU's approach is not uncommon. In fact, EU policy making in climate and energy policy has thus far been characterized by an incremental approach "establishing a number of policy levers and obtaining political agreement to progressively increase the impact of these levers over time" (Bergamaschi, Mabey, Born, & White, 2019, p. 19). However, as

[128] Communication from the Commission to the European Parliament, the Council, the European Economic and Social Committee and the Committee of the Regions, A Modern Budget for a Union that Protects, Empowers and Defends. The Multiannual Financial Framework for 2021-2027, COM(2018) 321 final, 2 May 2018.

[129] Commission Implementing Decision of 28 May 2014 on deciding to make a standardisation request to the European standardisation organisations pursuant to Article 10 (1) of Regulation (EU) No 1025/2012 of the European Parliament and of the Council in support of implementation of the EU Strategy on Adaptation to Climate Change [COM(2013) 216 final], C(2014) 3451 final.

"[c]limate impacts are happening faster and more severely than we thought" (p. 20), it can be questioned whether such a slow course of action can properly address the forthcoming challenges. In fact, climate resilience-building across the Union requires a high degree of harmonization already at the core elements. For example, a crucial aspect is the needed level of resilience, since investment costs and engineering requirements differ greatly depending on the targeted increase in global warming (1.5°C, 2°C or 3°C) due to the different intensity and extent of the expected impacts (IPCC, 2018; CarbonBrief, 2018). Since climate change impacts are of different type and intensity throughout the various geographical areas of the member states, it is also imaginable that a division of the latter in separate zones allows to establish different baselines regarding the mandatory level of resilience, with the respective proportionate distribution of funds for the necessary investments. Thus, it is important that relevant data is available and reaches EU policymakers so that they can assume responsibility and take initiative on discussing possible policy options and governance models not only regarding climate change mitigation but also climate resilience.

3. Heteronomy by international law tools?

Current EU action on climate resilience could, however, be majorly influenced and accelerated by the progress in international climate change governance. In the past few years, in fact, many international law acts concerning climate change have been emerging. The Paris Agreement, undoubtedly the most important one, dedicates article 7 to climate change adaptation, declaring it a global challenge faced by all sectors. The set goal is to enhance adaptive capacity, strengthen resilience and reduce vulnerability to climate change while ensuring an adequate adaptation response for the temperature target of 2°C by the end of the century. Adaptation should be based on common general principles, such as national drive, gender-responsiveness, participation, full transparency and scientific guidance, and international cooperation and assistance regarding sharing of information and best practices, strengthening institutional arrangements and scientific knowledge and improving the effectiveness of adaptation

actions. More importantly, however, it obliges the countries to start planning activities based on a non-exhaustive list of contents, which comprise the implementation of adaptation actions, the formulation of national plans, risk assessments, resilience-building and monitoring. Coordination of the planning activities is ensured by regular adaptation communications. The global stocktake on the implementation of the Paris Agreement also reviews the adequacy and effectiveness of the single adaptation efforts as well as the overall progress. Moreover, article 9 provides that financial resources should be balanced between mitigation and adaptation.

The Sendai Framework for Disaster Risk Reduction 2015-2030, adopted at the Third United Nations World Conference on Disaster Risk Reduction in March 2015, establishes seven global targets on reducing risks and building resilience, which include the substantial reduction of disaster damage to critical infrastructure and of disruption of basic services. For this purpose, it promotes the development of disaster risk assessments that include climate change scenarios on regional, national and local level.

Furthermore, the 2030 Agenda for Sustainable Development[130] set the goal to take action to combat climate change and its impacts by mitigation and adaptation to climate change and by enhancing resilience to disasters of cities and human settlements, in line with the Sendai Framework. It asks the countries to strengthen resilience to environmental hazards and natural disaster by integrating climate change measures into national policies, strategies and planning (Goal 13).

Finally, the UN New Urban Agenda[131] promotes cities and human settlements to "adopt and implement disaster risk reduction and management, reduce vulnerability, build resilience and responsiveness to natural and human-made hazards and foster mitigation of and adaptation to climate change" (par. 13(g)).

Although all of these international tools do not contain many energy-specific and legally binding measures, but rather limit themselves to the declaration of general goals and principles, they could represent an important stepping stone for the EU to further advance its legal framework on climate resilience in the energy sector.

[130] General Assembly Resolution 70/1, Transforming our world: the 2030 Agenda for Sustainable Development, 25 September 2015, A/RES/70/1.

[131] General Assembly Resolution 71/256, New Urban Agenda, 23 December 2016, A/RES/71/256.

CHAPTER 5: CYBERSECURITY

1. The digitalization between opportunities and risks

1.1. *The Internet of Things in the energy sector: smart systems*

Technological innovation is continuously pervading all the modern business sectors. The energy sector is no exception to this global phenomenon. The so-called "Internet of Things", i.e. the interconnection via communication networks of computing devices which send and receive data and enables people to remotely control and manage them, has the different segments of the energy supply chain already in a firm grip (International Energy Agency, 2017, pp. 24, 173) and completely changed the structure and management of traditional energy networks, disclosing potentially unlimited possibilities. In fact, modern networks have turned into "cyber-physical systems in which the functions of cyber and power components are tightly coupled in their operations" (Li, Shahidehpour, & Aminifar, 2017, p. 1368). The emergence of new terms to describe this reality, such as Smart Grids, Smart Energy Systems and microgrids, highlights a new way of organising, managing and interconnecting existing power systems.

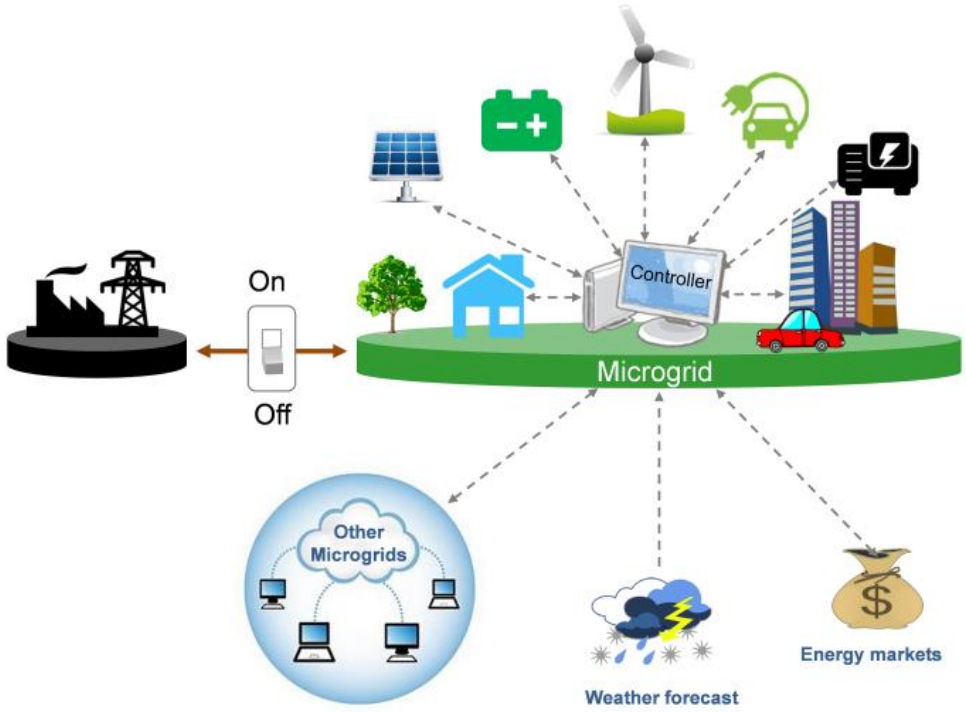
The term Smart Grid refers, in fact, to an electricity network that consists in physical infrastructure and a communication network. The two layers are interdependent: the physical grid collects and provides data via sensors and metering devices based on which the communication network carries out the necessary operational activities via a supervisory control and data acquisition (SCADA) system and an energy management system (EMS) (Goel, Hong, Papakonstantinou, & Kloza, 2015; Abdallah & Shen, 2018). Hence, the "two-flow transmission of both energy and information" (Proedrou, 2017, p. 450) is a main characteristic of Smart Grids. Smart Energy Systems translate this architecture into an integrated, coordinated and holistic approach that goes beyond the sole electricity sector, including also gas and thermal grids (Lund, Østergaard, Connolly, & Mathiesen, 2017). Such networks provide significant benefits over the traditional "analogue" grids, due to the fact that a bigger amount of relevant data for an efficient

energy dispatch can be collected and processed *in situ*. Smart meters in the supply areas inform the utility companies about the real-time consumption of energy over the day for each appliance, while phasor measurement units (PMU) provide crucial information about the situation on transmission lines. This results in better network reliability, as more accurate data about energy demand and generation is available, faults can be way faster detected and resolved, and maintenance is easier due to constant and accurate monitoring of performance. It also improves efficiency by reducing power losses. In fact, energy generation can be more closely matched to the consumption patterns of the relevant customers, the implementation of side-demand measures is easier, and theft of natural gas or electricity can be substantially reduced. Moreover, consumers can benefit from lower bills due to more accurate measuring of the actually consumed energy. Smart systems also facilitate the integration of renewable energy sources and contribute to the decarbonization of the energy sector. Thus, they guarantee "the optimal usage of the […] resources and [provide] more luxury services to the customers, at the same time, [increase] the […] companies' financial profits" (Abdallah & Shen, 2018, p. 8).

The term microgrids, on the other hand, describes a local system structure which is composed of many different distributed energy sources – such as renewable and conventional energy generators, energy storage units and even plug-in electric vehicles – and usually connected to the centralized power grid. Microgrids can be operated independently from the main network, thus forming a self-contained unit the energy demand of which can be satisfied by using the closely situated energy sources. In this way, energy consumers become important energy producers (prosumers) as well as active and informed participants in the energy market. However, microgrids also allow for interactivity with other connected networks, providing flexibility and ancillary services (Li, Shahidehpour, & Aminifar, 2017). Microgrids are "smart" as well, i.e. equipped with SCADA systems and EMS, in order to efficiently manage all the different interconnected elements.

Market players of the energy sector can furthermore take advantage of the latest developments in digital technology, i.e. cloud computing. It allows energy companies and utilities to store and analyse a large amount of data on remote servers, thus enabling

Figure 8: Basic schematic of a microgrid



Source: Berkeley Lab, 2019.

larger collaboration with partners and service organisations outside the company structure. A faster business deployment and development of integrated infrastructures, as well as the innovation of processes are some of the benefits of cloud computing. Moreover, there is a massive cost reduction as expensive centralised IT infrastructures become obsolete (CEER, 2018).

1.2. A new vulnerability: cyber-attacks

All these advantages, however, come with a hefty price tag. The energy sector is, in fact, increasingly targeted by cyber-criminals and already represents, next to financials, the leading sector in potential attacks. What's even more worrisome is that most of the cyber-attacks on energy infrastructure in the period 1980-2011 were successful (Venkatachary, Prasad, & Samikannu, 2018). The past couple of years have also seen an increasing intensity of cyber-attacks, causing major supply disruptions in the affected energy systems. Particularly significant was the incident at the Western Ukraine power

grid in 2015, which led to a six-hour shutdown of the electricity system and left hundreds of thousands of Ukrainians in the dark on a cold December day (Cassotta & Sidortsov, 2019). Two attacks in 2016 targeted again the Ukrainian electricity system as well as a nuclear plant in Germany[132]. In 2017, the so-called "WannaCry" ransomware that targeted computers worldwide also affected energy companies, shutting down tens of thousands of petrol stations in China. Moreover, cyber-attacks do not only damage the IT system but are also able to destroy physical energy infrastructure. In 2010, the Stuxnet attack targeted SCADA systems and led to significant damages in the Iranian nuclear power sector, "causing the centrifuges to spin out of control and tear themselves apart" (Venkatachary, Prasad, & Samikannu, 2018, p. 117). Thus, cybersecurity in the energy sector also entails national security concerns (Smith, 2018). However, only 0.15% of the attacks between the period 1980-2011 were traced back to a terroristic background. Terrorism and state-coercion are thus rather rare events, also due to the fact that such large-scale attacks create a lot of public and political attention. On the contrary, "many small scale cyber security threats are carried out on a daily basis" (Venkatachary, Prasad, & Samikannu, 2017, p. 251) with various motivations, such as financial gains, revenge, elimination of competition or simple entertainment (Li, Shahidehpour, & Aminifar, 2017).

The security concerns of cyber-incidents are commonly classified in three main categories (Goel, Hong, Papakonstantinou, & Kloza, 2015; Li, Shahidehpour, & Aminifar, 2017; Abdallah & Shen, 2018):

(1) data integrity: by assuming control over data flows, cyber-criminals can alter the authenticity and consistency of data which has already been collected or which is being collected via sensors and meters. Moreover, affected data flows can be rerouted, interrupted or simulated and distort critical information about the network. In the simplest hypothesis, a consumer alters his consumption data to lower his bills. In the more severe cases, the communication of the whole network is rendered inefficient and may even be completely interrupted.

[132] A list of recent cyber-attacks in the energy sector can be found in International Energy Agency, 2017, p. 125 and Venkatachary, Prasad, & Samikannu, 2018, pp. 114-116.

(2) availability: data must be accessible and timely to ensure the correct operational decisions at any moment. Cyber-attacks can delay the transfer of information or make it unavailable to certain parties, which can result in a blockage or corruption of the network resources. In fact, increased latency and loss of synchronization prevent the assessment of the real-time situation and significantly affect the network performance.

(3) confidentiality or information privacy: by compromising an energy network, malicious adversaries are enabled to eavesdrop on data flows and acquire sensitive information. Such sensitive information concerns on the one hand private communication of companies and trade secrets, on the other hand detailed information on customers. In this manner, criminals are able to extract critical data on energy consumption, such as when householders are at home and which appliances are running, allowing them to pinpoint the optimal moment to commit burglaries.

Thus, cyber-attacks pose a significant threat to the reliability of the network and the privacy of sensitive information. As a result, the affected network may suffer from communication inefficiency, information distortion, secrecy leakage, device malfunction and application misconfiguration which can have far-reaching consequences. In particular concerning is the ability to remotely disable the functionality of all smart meters, disconnecting all the hooked-up customers (Hanne, 2018). Moreover, the loss of intellectual property, trade secrets and business intelligence, increasing security costs and a damage in reputation critically affect the economy of concerned energy companies. In fact, “[m]any companies reporting major attacks suffer a 1-5% drop in their stock value” (Venkatachary, Prasad, & Samikannu, 2017, p. 250). While it is undisputed that cyber-incidents hamper innovation and research, the exact economic costs are nonetheless uncertain and difficult to quantify. In fact, many companies are unwilling to disclose security breaches and share attack patterns, and most countries have not shown reasonable efforts in calculating losses so far. Hence, calculations are based on unreliable and incomplete information with estimations ranging from $15 billion to $1 trillion (p. 253).

Ensuring an adequate level of cybersecurity entails both reliability and resilience measures. However, securing smart systems is difficult due to the weakest link problem. In fact, "[t]he cyber security of any organisation can only be as strong as its weakest link" (Venkatachary, Prasad, & Samikannu, 2018, p. 122). It is thus necessary to secure every potential access point and node to the network, from the households to the companies, which results in exponential costs for the network operators and utilities. Nonetheless, due to the fact that network management entails a considerable amount of human activity, a cyber-attack cannot be entirely prevented. Human errors are, indeed, responsible for 95% of security breaches, while approximately half of the attacks are caused by insider IT access. An additional problem is the so-called "superman fallacy" (Smith, 2018, p. 377), according to which energy companies do not expect a cyber-attack to happen and/or believe that the government will help them out after a breach has been detected. Thus, a proper level of investments in cybersecurity is lacking.

In this context, it is important that legal rules provide a clear framework on the detection and reporting of security breaches, on the responsibilities and on the minimum standards that have to be met in order to prevent or mitigate cyber-attacks, while ensuring a diligent processing of sensitive information. The EU framework on cybersecurity is based on a multitude of policy documents and legally binding and non-binding acts as well as on a multilayer approach that embraces private undertakings, service providers, member states, collaborative bodies, agencies and the European Commission. The relevant legal acts concern a general approach to all cybersecurity threats as well as a set of sector-specific provisions for the area of energy. These interventions can be distinguished in three different waves.

2. Cybersecurity as a priority of EU security and defence policy

2.1. *The EU Cybersecurity Strategy*

The first strategy on cybersecurity, entitled "Cybersecurity Strategy of the European Union: An Open, Safe and Secure Cyberspace"[133], was adopted in 2013 and represented the first comprehensive approach on cybersecurity. It explicitly recognized the fundamental importance of Information and Communications Technology (ICT) for the European economy and, *inter alia*, the energy sector. Thus, cybersecurity was declared a shared responsibility of public authorities, the private sector and individual citizens that requires action from and coordination between everyone to adequately respond to cyberthreats. The strategy was based on five strategic priorities concerning cyber-resilience, cybercrime, cyber-defence, the development of industrial and technological standards, and international action. It is worth noting that the strategy put particular emphasis on the link of cybersecurity to cybercrime, terrorism and general defence of the Union to be developed under the Common Foreign and Security Policy, considering also the fact that the strategy was the result of a joint effort from the Commission and the High Representative of the European Union for Foreign Affairs and Security Policy. Additionally, the strategy built on the framework for electronic communications[134] and the European Network and Information Security Agency (ENISA), an advisory body which had already been established in 2004[135] to facilitate cooperation, spread awareness and provide expertise in the field of network and information security.

Later in 2013, the European Parliament and the Council adopted Directive 2013/40/EU on attacks against information systems, in a view to approximate the national criminal law frameworks by establishing minimum rules on criminal offences and sanctions. The Directive is specifically focused on attacks against information systems which are part of

[133] Joint Communication to the European Parliament, the Council, the European Economic and Social Committee and the Committee of the Regions, Cybersecurity Strategy of the European Union: An Open, Safe and Secure Cyberspace, JOIN(2013) 1 final, 7 February 2013.

[134] Directive 2002/21/EC of the European Parliament and of the Council of 7 March 2002 on a common regulatory framework for electronic communications networks and services (Framework Directive).

[135] Regulation (EC) No 460/2004 of the European Parliament and of the Council of 10 March 2004 establishing the European Network and Information Security Agency.

national or European critical infrastructure – and thus also energy infrastructure – at least for cases which are not minor. However, it is ultimately the competence of the member states to exactly determine the requirements that have to be met in order for an attack to be not minor. The member states are required to criminalize five different types of conduct: unauthorised access to information systems, illegal system interference, illegal data interference, illegal interception, and the production, sale, procurement for use, import, distribution or otherwise making available of computer programmes and passwords/codes that are designed or employed to commit any of these criminal offences. Moreover, the incitement, aiding and abetting to commit any of these crimes, as well as the attempt to illegally interfere in network and information systems, must be punishable. Criminal liability extends also to legal persons, insofar they committed one of these offences for their benefit. More severe penalties than those laid out by the Directive are encouraged if an attack has been committed by a criminal organisation. However, the Directive excludes liability in case of acts committed without criminal intent, "for instance where a person does not know that access was unauthorised or in the case of mandated testing or protection of information systems, such as where a person is assigned by a company or vendor to test the strength of its security system" (recital n. 17). Furthermore, the sole violation of contractual obligations or agreements on the restriction of access should not lead to criminal proceedings. Lastly, the Directive calls upon improved cooperation between law enforcement bodies, judicial authorities, service providers and producers. However, no specific legally binding measures to achieve this goal are foreseen, except the need to maintain a national operational point of contact for the exchange of information.

ENISA's mandate was revised and extended for another seven years. Regulation (EU) No 526/2013 streamlined and enhanced its tasks, strengthening its role in assistance and expertise on network and information security. Besides supporting the development of Union policy and law, it is responsible for capacity building in the prevention, detection and response to attacks and incidents, for supporting voluntary cooperation and awareness spreading, for fostering research, development and standardisation, as well as for cooperating with EU institutions and bodies, including in the field of cybercrime.

ENISA was also given a significant role in promoting international cooperation on the matter.

In the EU Security Agenda[136] of 2015, the fight against cybercrime was identified as one of the three core priorities for European security in the period 2015-2020. It defined cybercrime as "ever-growing threat" to the economy and the establishment of the Digital Single Market by targeting critical infrastructures. Building on the 2013 Cybersecurity Strategy, the Agenda requires as the first step the full implementation of Directive 2013/40/EU on attacks against information systems as well as the adoption of the foreseen Directive on network and information security. The second step provided by the Agenda is of cooperative nature: (a) cooperation between competent judicial authorities to enable quicker cross-border access to evidence and information, (b) cooperation with the private sector on the basis of public-private partnerships, (c) cooperation with Europol's European Crime Centre as central information hub for law enforcement and (d) cooperation with Eurojust for spreading appropriate best practices for investigations and prosecutions of cybercrime.

2.2. The Directive on security of network and information systems

On 19 July 2016, the first EU-wide legal act on cybersecurity – another cornerstone of the 2013 Cybersecurity Strategy – was introduced: Directive (EU) 2016/1148 concerning measures for a high common level of security of network and information systems across the Union, generally also referred to as NIS-Directive. Its primary objective is to ensure and enhance the security of the internet, private networks and information systems by requiring minimum security standards and envisaging an intricate net of new bodies for inter-institutional cooperation. The legal basis of the framework was identified in article 114 TFEU, concerning the approximation of laws for the establishment and functioning of the internal market, i.e. the Digital Single Market in this context. The Directive applies

[136] Communication from the Commission to the European Parliament, the Council, the European Economic and Social Committee and the Committee of the Regions, The European Agenda on Security, COM(2015) 185 final, 28 April 2015.

to all network and information systems, i.e. electronic communications networks according to Directive 2002/21/EC, devices or groups of interconnected or related devices which perform automatic processing of digital data and digital data that is stored, processed, retrieved or transmitted via the former two types of networks (art. 4(1)). The security of such networks is defined as the ability to resist any action that compromises the availability, authenticity, integrity or confidentiality of stored, transmitted or processed data or the related services offered by, or accessible via, network and information systems (art. 4(2)), thus covering all the cybersecurity concerns laid out in section 1.2. The Directive, however, excludes its applicability for the case in which sector-specific legislation may be put in place in the future. In fact, provided that equal security requirements are set out, sector-specific legal acts will apply instead due to their nature of *lex specialis*. In this manner, the future adoption of specific cybersecurity acts in the energy sector is explicitly safeguarded.

Article 7 of the Directive follows the general characteristic of EU legislation in energy security. In fact, every member state is required to adopt a national security strategy, which defines the strategic objectives and appropriate measures to achieve and keep a high level of security of network and information systems. The national strategy must cover at least the sectors and services contained in Annexes II and III, which comprise electricity, oil, natural gas and cloud computing. *Inter alia*, it must also provide a governance framework, identify the measures on preparedness, response and recovery, indicate research and development plans on cybersecurity and contain a risk assessment plan.

The NIS-Directive also provides security and notification requirements that have to be established by the member states for two different types of entities. The first one, called operator of essential services, is a new figure the identification of which lies within the competence of the member states and must follow three criteria. An operator of essential services must provide a service (a) which is essential for the maintenance of critical activities for the society and economy, (b) the provision of which depends on network and information systems, and (c) an incident on which would have significant disruptive effects on its provision. It is the task of the member states to decide when a

service is deemed essential for societal and economical activities. This may lead to some problematic inconsistencies between the member states, which can determine different levels of cybersecurity across the EU for the same service. In fact, a consistent approach in the identification of those operators is necessary for a variety of reasons[137]:

(1) it reduces the risk in cross-border dependencies; this is particularly significant for energy operators, as they often provide cross-border services (for ex. TSOs). Thus, an uneven cyber-protection regarding their services could propagate incidents across the member states.

(2) it guarantees a level playing field for the operators in the internal market; the fulfilment of the security and notification requirements set out by the NIS-Directive as well as the imposition of a higher security standard by the member states allowed by article 3 entails considerably higher regulatory cost for the affected operators, which therefore are at an economic disadvantage compared to other entities of the same nature but located in a different member state that have not been identified as operators or that are obliged to only fulfil the minimum security standard.

(3) it reduces the risk of divergent interpretation of the Directive across the EU; operators that are present in different member states and which must meet divergent levels of cybersecurity due to a different implementation of the NIS-Directive are, as a consequence, unreasonable burdened by administrative and regulatory bureaucracy.

(4) it ensures the usefulness of exchange in information and experiences, due to the common understanding on the identification of operators of essential services.

These considerations lead to doubts on the grounds for which such a leeway for national discretion has been enabled. In particular, it is questionable whether a recourse to the need to ensure the national specificities is a convincing argument, considering that – unlike climate change impacts – cyber-incidents are not geographically dependent and

[137] See also Report from the Commission to the European Parliament and the Council assessing the consistency of the approaches in the identification of operators of essential services in accordance with Article 23(1) of Directive 2016/1148/EU on security of network and information systems, COM(2019) 546 final, 28 October 2019, pp. 2-3.

the national economies are not that different to conclude that the essentiality of a service would vary considerably from country to country. As regards the interpretation of the criterion of "significantly disruptive effects", article 6 provides further guidance by providing a list of cross-sectoral factors – such as the number of users, dependency of others sectors, market share of the entity and geographical spread of the effects in case of an incident – that have to be considered and requiring the member states to also take into account sector-specific factors. Moreover, article 4(4) of the Directive specifies that operators of essential services are of private or public nature and must be identified within the specific types laid out in Annex II. If the relevant entity provides its service in more than one member state, the decision on the identification must be preceded by consultations between the member states. In respect of the energy sector, these rules allow to designate operator of essential services almost all key players of the energy market. In fact, Annex II lists suppliers and producers, TSOs, DSOs, SSOs, LNG system operators, and operators of oil refining and treatment facilities as eligible types. Considering also the interconnected structure of the electricity and gas market, the smallest cyber-incident could potentially spill over and cause a significant supply disruption in the Union. It can, however, be questioned whether the list set out in Annex II is suited for the emerging realities of the smart energy systems revolution. The establishment of new bodies for balancing and managing the smart networks, such as aggregators, metering operators or microgrid operators, may give rise to important new energy market players, where cyber-incidents can cause considerable adverse effects on the provision of their services as well (Holzleitner & Reichl, 2017). Thus, an extension of the types in Annex II for the energy sector appears to be indispensable in the future.

Providers of digital services are the second type of entity concerned by the security and notification requirements. For the purpose of the NIS-Directive, the category of digital services comprises the services provided by a legal person at a distance, commonly for remuneration, by electronic means and at the individual request of the recipient, and which consist in one of the types set out in Annex III, i.e. an online marketplace, an online search engine or a cloud computing service (art. 4(5) and 4(6)). Software developers, however, do not provide a digital service (recital n. 50). Unlike for operators of essential

services, digital service providers must not be identified by the member states, since the Directive concerns all the ones set out in Annex IIII and not just those that provide essential digital services.

The security requirements consist in the obligation of operators of essential services (art. 14) and digital service providers (art. 16) to take appropriate and proportionate technical and organisational measures to manage the relevant cybersecurity risks for their activity. Moreover, they must adopt appropriate measures to prevent and minimise the impact of cyber-incidents. If a significant (art. 14) or substantial (art. 16) cyber-incident occurred, operators and providers are obliged to notify "without undue delay" the competent authority, designated by the member state to monitor the application of the NIS-Directive at national level, or the computer security incident response team (CSIRT, see below), also designated by the member state to monitor, prevent and respond to cyber-incidents at national level. Additionally, the operator of essential services that relies on digital services of a third-party provider must notify any significant impact on the continuity of said essential service where a cyber-incident affects the digital service provider. If a cyber-incident indirectly affects also other member states, the competent authority or CSIRT must inform them. Furthermore, the competent authority or the CSIRT can, after consulting with the operator or provider, inform the public about the incident where public awareness is necessary for the prevention or response of a cyber-incident. The Directive also encourages the voluntary notification of incidents by entities which are not digital service providers or which have not been identified as operators of essential services, if the relevant incident has a significant impact on the continuity of the provided service. The competent authorities are responsible for the compliance by the operators of essential services of these rules and can issue binding instructions for the implementation. In respect of digital service providers, competent authorities may adopt *ex post* supervisory measures if they have evidence of non-compliance. If a digital service provider's main establishment and network and information system are located in different member states, the competent authorities of the two member states must cooperate and assist each other. The security and notification requirements, however, do not apply to digital service providers that are micro- and small enterprises, in order

to avoid disproportionate financial and administrative burdens on them (art. 16, par. 11). The rest of the provisions in the NIS-Directive concern the establishment of bodies for the cooperation and coordination in the field of cybersecurity. Firstly, besides competent authorities for monitoring the implementation and application of the Directive, the member states must set up a single point of contact (art. 8), which represents the national link for cross-border cooperation with the member states and other bodies. Furthermore, it consults and cooperates with the national law enforcement and data protection authorities. If the member state only designated one competent authority, that authority is automatically also the single point of contact. Secondly, the member states must establish one or more computer security incident response teams (CSIRTs), which are responsible for cyber-risk and incident handling (art. 9). Their tasks are laid out in detail in Annex I and comprise monitoring, dissemination of information, awareness spreading as well as promoting the adoption and use of common or standardised practises in the field of cybersecurity. They are also required to actively cooperate with the private sector. Article 10 provides that competent authority, single point of contact and CSIRTs of the same member state must work together at national level. In particular, the single point of contact must be informed about the received notifications on cyber-incidents. The CSIRTs form a network on EU level, which is intended to "contribute to the development of confidence and trust between the Member States and to promote swift and effective operational cooperation" (art. 12). The network also includes the permanent Computer Emergency Response Team for the EU Institutions, bodies and agencies (*CERT-EU*) and ENISA, which provides the secretariat and actively supports the cooperation. The network acts as a forum for exchanging and discussing information on cybersecurity as well as for finding a coordinated solution to an incident and appropriate support for affected member states. Thirdly, the Directive establishes a Coordination Group for cooperation and information exchange among the member states (art. 11). It is composed of representatives of the member states, the Commission, ENISA and, when appropriate and invited to participate, of representatives of relevant stakeholders. Its tasks comprise strategic guidance for the CSIRTs network, the exchange of best practices, information, and experiences, and discussing risk

preparedness of the member states. It also examines the reports submitted by the single points of contact and by the CSIRTs network. Every year and a half, it is required to prepare a report on its activities. Article 13 enables the EU to conclude international agreements with third countries or international organisations for their participation in the Cooperation Group.

Lastly, article 19 obliges the member states to promote and encourage the use of European or international standards and specifications concerning the security of network and information systems. To this goal, ENISA is tasked with the preparation of advice and guidelines on the matter. The non-compliance with the national provisions that implement the NIS-Directive is subject to effective, proportionate and dissuasive penalties. Although the member states were required to adopt all the necessary national provisions for compliance with the NIS-Directive by 9 May 2018, only by September 2019 all 28 member states had notified full transposition. On 28 October 2019, the Commission published its Report assessing the consistency of national approaches in the

Table 9: The identification of essential services in the electricity subsector in different member states sorted by a less or more detailed approach

<table>
<tr><th>Estonia</th><th>Portugal</th><th>Denmark</th><th>Bulgaria</th></tr>
<tr><td rowspan="5">Electricity supply</td><td rowspan="2">Distribution system operators</td><td rowspan="2">Electricity Distribution</td><td>Distribution of electricity</td></tr>
<tr><td>Ensuring the functioning and maintenance of a distribution system for electrical energy</td></tr>
<tr><td rowspan="2">Transmission system operators</td><td rowspan="2">Electricity Transmission</td><td>Transmission of electricity</td></tr>
<tr><td>Operation, maintenance and development of an electricity transmission system</td></tr>
<tr><td></td><td>Electricity production</td><td>Electricity production</td></tr>
<tr><td></td><td></td><td>Electricity Market</td></tr>
</table>

identification of operators of essential services[138], as required by article 23, par. 1 of the Directive. The importance of a coherent EU-wide identification of such operators has already been highlighted above. The report showed, however, that the member states have developed various methodologies for the identification. As regards the energy sector, some degree of consistency could be maintained by the fact that many member states built on the pre-existent framework set out by Directive 2008/114/EC on critical infrastructures as a point of reference. Nonetheless, the differences concern many elements. Firstly, in respect of the identification of essential services, member states have adopted more or less detailed approaches, leading to a different number
in operators identified and to consistency gaps in the relevant service subsectors across the Union. The report (p. 12) provides an example of the electricity subsector on this matter (table 9). Moreover, different quantitative and qualitative thresholds are employed. As a consequence, the number of operators of essential services varies accordingly throughout the member states. In the energy sector, it ranges from 0.3 operators to 29 operators per million inhabitants. Additionally, eleven member states have identified operators of essential services in sectors not foreseen by Annex II. One of these sectors concerns heat, with operators being heat producers and suppliers. As the Commission notes, and as has already been highlighted above, this "gives rise to the question whether the current scope of Annex II is appropriate in order to meet the objective of protecting all operators in the Union that are critical for society and the economy" (pp. 18-19). To address these issues, the Commission asked the member states to ensure that all existing essential services are identified and to cooperate more actively with each other in order to eliminate existing inconsistencies.

Nonetheless, the report acknowledges a major progression in the security of network and information systems. In fact, Directive 2016/1148 "served as a catalyst in many Member States paving the way for real change in the institutional and regulatory landscape with regard to cyber-security", triggering a "comprehensive assessment of the

[138] Report from the Commission to the European Parliament and the Council assessing the consistency of the approaches in the identification of operators of essential services in accordance with Article 23(1) of Directive 2016/1148/EU on security of network and information systems, COM(2019) 546 final, 28 October 2019.

risks associated with operators active in critical activities and modern network and information systems" (p. 22).

4. Cybersecurity as an economic problem

At the same time as the adoption of the NIS-Directive, the Commission published a new strategic Communication on cybersecurity, entitled "Strengthening Europe's Cyber Resilience System and Fostering a Competitive and Innovative Cybersecurity Industry"[139]. It departed from the original criminalistic approach and focused instead on the impacts of cyber-attacks on the economy and reputation of European businesses. The Communication announced new initiatives divided in three categories to enhance cybersecurity. The first category concerned cooperation, knowledge and capacity-building. Thus, the Commission called for effective cooperation at EU level in both small-scale and large-scale attacks by integrating cybersecurity aspects in existing crisis management mechanisms, by creating an information hub to enable a structured and organised information exchange between the member states and by establishing a specific advisory group on cybersecurity. Other measures related to the creation of a cybersecurity education, exercise and training platform as well as to the introduction of sector-specific risk assessments to address inter-sectoral interdependencies. The second category pertained to the Digital Single Market and identified ineffective and differing ICT security certification mechanisms as one of the big challenges for the functioning of the market. Finally, the Communication focused on enabling the necessary investments in cybersecurity for small and medium-sized enterprises. The last category concerned the establishment of a contractual public private partnership (cPPP) on cybersecurity to incentivize research and innovation.

The implementation of the Communication featured the adoption of two legal acts. On

[139] Communication from the Commission to the European Parliament, the Council, the European Economic and Social Committee and the Committee of the Regions, Strengthening Europe's Cyber Resilience System and Fostering a Competitive and Innovative Cybersecurity Industry, COM(2016) 410 final, 5 July 2016.

the one hand, with Decision of 5 July 2016[140], the Commission approved the signing of a contractual arrangement on a public-private partnership for cybersecurity industrial research and innovation between the European Union and the European Cybersecurity Organisation (ECSO). ECSO is a non-for-profit association that was established in June 2016 and which represents a wide variety of stakeholders in the area of cybersecurity. The objective of the public-private partnership is to foster cooperation at early stages of research and innovation in order to build trust between the member states and the industry. The partnership is established under the Horizon 2020 Framework Programme and remains in force until 31 December 2020, with an investment of €450 million by the EU. Cybersecurity market players are required to further invest thrice that amount, thus enabling a total investment of €1.8 billion.

On the other hand, the Commission adopted a Recommendation[141] on the coordinated response to large-scale cybersecurity incidents. An incident is large-scale when it "is too extensive for a concerned Member State to handle on its own or when it affects two or more Member States with such a wide-ranging impact of technical or political significance that it requires timely coordination and response at Union political level" (recital n. 2). According to the Commission, an effective response to such incidents consists in quick coordination and cooperation between all relevant stakeholders, alongside appropriate national preparedness and joint action at EU level. However, the primary responsibility for responds to large-scale attacks lies with the member states. Thus, the Recommendation provides that member states and EU institutions should create an EU Cybersecurity Crisis Response Framework based on the annexed blueprint, identifying the relevant actors at all levels and clarifying their relationship for an effective coordination. Consequently, the member states must work together with the Commission and the European External Action Service in order to render their national crisis management mechanisms compatible to the new Framework as well as introduce the necessary measures and procedures to ensure the efficient technical, operational

[140] Commission Decision of 5 July 2016 on the signing of a contractual arrangement on a public-private partnership for cybersecurity industrial research and innovation between the European Union, represented by the Commission, and the stakeholder organisation, C(2016) 4400 final.

[141] Commission Recommendation (EU) 2017/1584 of 13 September 2017 on Coordinated Response to Large Scale Cybersecurity Incidents and Crises, C(2017) 6100 final.

and strategic/political cooperation at EU level. Lastly, the Recommendation requires both member states and EU institutions to regularly test their response to large-scale incidents at national and European level with the involvement of private entities of the relevant sectors.

5. Combining the two approaches

5.1. A new cybersecurity strategy

In 2017, the Commission announced together with the High Representative of the Union for Foreign Affairs and Security Policy a new legislative package on cybersecurity, entitled "Resilience, Deterrence and Defence: Building strong cybersecurity for the EU"[142], which tried to unite both approaches and combine them into an updated strategy on cybersecurity governance in the EU. In fact, while the first part on resilience focused on new ideas to introduce in the Digital Single Market, the chapter on deterrence concerned criminal aspects and law enforcement. The final part, however, presented future efforts at international level. Additionally, the updated strategy announced new key proposals, such as:

(1) a revision of the Regulation on ENISA to establish a permanent mandate;
(2) the introduction of an EU cybersecurity certification framework based on a security-by-design approach;
(3) the implementation of cybersecurity strategies in sector-specific acts for areas like energy;
(4) the integration of cyber aspects in existing EU crisis management mechanisms;
(5) the institution of a Cybersecurity Emergency Response Fund to assist member states affected by a cyber-incident, provided they put in place an appropriate crisis system;
(6) the development of a network of cybersecurity competence centres with a

[142] Joint Communication to the European Parliament and the Council, Resilience, Deterrence and Defence: Building strong cybersecurity for the EU, JOIN(2017) 450 final, 13 September 2017.

European Cybersecurity Research and Competence Centre;

(7) the promotion of cyber hygiene and awareness to reduce the human risk factor;

(8) the facilitation of cross-border access to electronic evidence to allow more effective cybercrime investigation;

(9) a bigger focus on fighting cybercrime in the darknet;

(10) a €10.5 million fund to fight cybercrime under the Internal Security Fund-Police Programme;

(11) the development of a capacity building network to support third countries in addressing cyberthreats to increase the level of cybersecurity globally.

It is, moreover, worth noting that the new strategy considers particularly serious cyber-incidents or attacks a "sufficient ground for a Member State to invoke the EU Solidarity Clause" (p. 8). Said clause is contained in article 222 TFEU and provides that "[t]he Union and its Member States shall act jointly in a spirit of solidarity if a Member State is the object of a terrorist attack or the victim of a natural or man-made disaster". The future adoption of legal frameworks on the response to such events as set out by Commission Recommendation (EU) 2017/1584 will raise questions on the relationship between the regimes. In fact, protectionist member states may want to choose the mechanism that involves the EU the least, thus frustrating the Union's efforts in establishing legally binding *ex ante* response mechanisms.

5.2. Foreign direct investments and targeted sanctions

The year 2019 has been very productive for the implementation of the new strategy and has witnessed the adoption of many important legal acts on cybersecurity. Regarding the dimension of EU security and defence, two interventions are significant.

On the one hand, Regulation (EU) 2019/452 of 19 March 2019 established a framework for the screening of foreign direct investments within the EU on the grounds of security and public order. The screening mechanism essentially consists in a notification mechanism to the Commission of foreign direct investments in order to assess the consequent "risks to security or public order arising from significant changes to the

ownership structure or key characteristics of a foreign investor" (recital n. 11). For the purpose of said assessment, the member states and the Commission can, as far as the energy sector is concerned, consider the potential effects of the foreign investment on critical energy infrastructure, on critical technologies including cybersecurity and energy storage, on the supply of energy and on the access to sensitive information (art. 4). The Regulation furthermore requires notification by the member states to the Commission on any foreign direct investment that is undergoing screening and the submission of an annual report on the foreign direct investments that occurred in their territory every year by 31 March. The Commission can issue an opinion on the screening. Moreover, the member states can issue an opinion on any foreign direct investment planned or completed in another member state, subject to screening or not, when it is likely to affect its security or public order or when they have relevant information on the matter. The member states' and the Commission's opinions must be given due consideration by the relevant country. The Commission can also issue an opinion when it considers a direct foreign investment to likely affect projects or programmes of Union interest, i.e. "which involve a substantial amount or a significant share of Union funding, or which are covered by Union law regarding critical infrastructure, critical technologies or critical inputs" (art. 8, par. 3). Annex I provides a list of such projects or programmes, mentioning therein *inter alia* the Horizon 2020 Framework and the TEN-E Regulation.

On the other hand, Council Regulation (EU) 2019/796 and Council Decision (CFSP) 2019/797 of 17 May 2019 introduced targeted sanctions to persons responsible for or in the support of cyber-attacks. However, only cyber-attacks "with a significant effect, including attempted cyber-attacks with a potentially significant effect, which constitute an external threat to the Union or its Member States" (art. 1, par. 1) are of relevance for the application of the sanction regime. Thus, the criminal act must originate in or be carried from outside the EU, use foreign infrastructure or be realized, supported or directed by a natural or legal person which is established or operating in a third country. Furthermore, an attack is threatening for the EU or its member states when affecting ICTs concerning critical infrastructure and essential services, such as energy services. The provided sanctions are twofold:

(1) asset freeze, i.e. the (temporary) unavailability of all funds and economic resources and the prohibition to make funds or economic resources directly or indirectly available to the benefit of the relevant person or entity;
(2) travel ban, i.e. the prohibition of entry into or transit through the territory of the member states (excluding the case in which the person is a citizen of the member state).

The sanctions are applied to persons or entities responsible for a committed or attempted cyber-attack, that provided any financial, technical or material support (including planning, preparing, encouraging or facilitating the attack, or which are associated with the former two categories. The names of the relevant persons or entities are inserted in an annexed list following a unanimous decision by the Council upon proposal from a member state or from the High Representative of the Union for Foreign Affairs and Security Policy. The list must also provide the reasons for the inclusion. It is worth noting that sanctions of this nature are not new but originate from the international legal regime on counterterrorism and have also been employed by the EU in its response to the annexation of Crimea by the Russian Federation. However, it is the first time that such sanctions are applied to persons that do not necessarily concern terrorists or, more generally, persons and entities acting with geopolitical intentions.

5.3. The Cybersecurity Act

Regarding the Digital Single Market, Regulation (EU) 2019/881 of 17 April 2019, entitled "Cybersecurity Act", revised ENISA and introduced a framework on an EU-wide cybersecurity mechanism. ENISA's mandate, which would have expired in 2020, was renewed for an indeterminate period and transformed into a centre of expertise on cybersecurity in general. To highlight these changes, ENISA was appointed the permanent European Union Agency for Cybersecurity. The revision was considered necessary due to changes in the "overall policy context" (recital n. 16) and the "increasing cybersecurity risks and challenges" (recital n. 19). Article 4 of the Cybersecurity Act assigns seven main tasks to the Agency, which build on the basis of the

previous ENISA Regulations:

(1) assistance to the EU institutions, bodies, offices, agencies and to the member states in the development and implementation of EU cybersecurity policies, including sector-specific measures;
(2) support in capacity-building and preparedness;
(3) promotion of cooperation, information sharing and coordination at all levels;
(4) contribution to the increase of cybersecurity capabilities at EU level;
(5) promotion of the new EU cybersecurity certification mechanism;
(6) promotion of a high level of cybersecurity awareness, cyber-hygiene and cyber-literacy.

Additionally, it must regularly prepare an in-depth EU Cybersecurity Technical Situation Report on incidents and threats based on public information, own analysis and national reports.

More importantly though, the Cybersecurity Act provides a European certification framework in order to increase the level of cybersecurity within the EU, harmonise the approach to cybersecurity certification schemes and create a functioning Digital Single Market on ICT products, ICT services and ICT processes. A cybersecurity certification attests that its holder complies with specific security requirements regarding the offered products, services and processes. The single certification schemes are going to be identified by a “Union rolling work programme” published by the Commission within 28 June 2020, which identifies the strategic priorities and sets out a list of products, services and processes which are eligible for certification schemes based on a series of criteria. The programme must be updated every three years or more often, if necessary. The certification schemes are prepared by ENISA, upon request by the Commission. For this purpose, ENISA consults with all relevant stakeholders and establishes a dedicated working group for the scheme. The scheme is then submitted to the Commission, which may adopt implementing acts. ENISA must evaluate each adopted scheme at least every 5 years. Article 49, however, does not specify the moment in which a certification scheme is adopted. In absence of an explicit clause, two are the possible interpretations: (a) a scheme is adopted when submitted by ENISA to the Commission, or (b) the

adoption occurs after the Commission reviewed the fulfilment of the requirements set out in article 51, 52 and 54 and after having decided on any implementing acts. Given that article 49, paragraph 7 considers a scheme after its submittal to the Commission still a "candidate scheme" and national cybersecurity schemes cease to produce effects as provided by the Commission's implementation act (art. 57, par. 1), the second solution appears to be more convincing. A certification scheme must be designed to achieve the minimum security objectives set out in article 51, such as identifying and documenting known dependencies and vulnerabilities, recording system access, verifying the absence of known vulnerabilities as well as ensuring security-by-default and security-by-design. The 2017 strategy on cybersecurity emphasizes in particular the need for a security-by-design approach, according to which well-known and well-documented defects must be addressed before putting the product or service on the market, and theorizes a link with the duty of care principle. As a consequence, it appears that damages caused to the customer by a cyber-incident due to a ICT product or service which is provenly not secure by design could give rise to successful liability claims against the relevant producer of operator. As a consequence, the acquisition of a cybersecurity certification for the affected product or service may thus exclude such liability. The scheme must also specify the "assurance level", i.e. the level of risk associated with the use of the relevant ICT product, service or process. Article 52 distinguishes three assurance levels:

(1) basic: the ICT product or service meets the corresponding security requirements, which minimise the known basic risks of incidents and cyber-attacks, and it must include at least a review of technical documentation;

(2) substantial: the ICT product or service meets the corresponding security requirements, which minimise the known cybersecurity risks and the risk of incidents and cyber-attacks carried out by actors with limited skills and resources; it also must include a review that demonstrates the absence of publicly known vulnerabilities and the correct implementation of the necessary security functionalities;

(3) high: the ICT product or service meets the corresponding security requirements, which minimise the risk of state-of-the-art cyber-attacks carried out by actors

with significant skills and resources, and includes a review to demonstrate the absence of publicly known vulnerabilities, the correct implementation of necessary security functionalities at the state of the art and the assessment of its resistance to skilled attackers.

Furthermore, the scheme must contain all the other elements listed in article 54.

The cybersecurity certification is voluntary, unless otherwise specified by Union or national law, and temporary in nature. The EU scheme determines maximum period of validity of the certificate, the expiry of which can lead to the right to renewal if the necessary requirements are still met. The certificates with assurance level basic or substantial are issued by conformity assessment bodies, while for those with a high assurance level the competence is of the national cybersecurity certification authorities. National cybersecurity certification authorities also have supervisory functions and are responsible for enforcing of the certification schemes, for monitoring compliance and for the complaints raised by natural or legal persons concerning the certificates. Thus, they can carry out investigations, withdraw issued certificates that do not comply with an EU certification scheme and impose penalties on infringing persons. The authorities are designated by the member state and must be independent from the supervised entities. To ensure their independence and effective functioning, national cybersecurity certification authorities are subjected to peer review every 5 years, which is carried out by at least two national cybersecurity certification authorities of other member states and the Commission.

National cybersecurity certification authorities are collectively involved in the certification framework via the new European Cybersecurity Certification Group (ECCG). It is, indeed, composed of representatives of national cybersecurity certification authorities or representatives of other relevant national authorities and has a supplementary role. Its tasks comprise, *inter alia*, assistance and cooperation with ENISA for the preparation of certification schemes, the adoption of an opinion on candidate schemes and the adoption of opinions for the Commission on the review of adopted schemes. Furthermore, for justified reasons it can request the adoption of a certification scheme in relation to ICT products, services or processes not covered by the Union rolling

programme.

In alternative to a cybersecurity certification, the producer or provider of ICT products or services can issue an EU statement of conformity, declaring to fulfil all the requirements of the certification scheme. However, this is only possible in the context of a basic assurance level. The statement of conformity must be submitted to the national cybersecurity certification authority as well as to ENISA. EU statements of conformity must be recognized in all member states. The producer or provider of an ICT product or service for which a certificate or statement of conformity has been issued must publish supplementary information concerning guides and recommendations for the end users, the period for which security support is guaranteed, contact information and a reference to online repositories listing relevant publicly disclosed vulnerabilities.

Regarding existing national cybersecurity certification schemes covered by a European cybersecurity certification scheme, they cease to produce effects as specified in the Commission's implementing act on the EU certification scheme. Already issued certificates remain valid until their expiration, while new national certifications schemes may not be established for ICT products, services or processes which are already subject to an EU certification scheme,

Natural and legal persons have the right to lodge a complaint with the body or authority issuing a European cybersecurity certificate. The decision by the authority or body on the matter can be challenged by the complainant before the competent national court. Similarly, the failure to act on a complaint can be brought to the national court.

It remains to be seen whether the EU cybersecurity certification schemes will be convincing enough to become a standard for European energy businesses and undertakings. The first evaluation on the functioning, efficiency and use of the certificates, which is expected to be released by 31 December 2023, will shed light on the success of the new framework.

6. Sector-specific acts on cybersecurity in the area of energy

The first energy-specific legal act on cybersecurity was the Recommendation on preparations for the roll-out of smart metering systems[143], adopted in 2012 by the Commission. Although dedicated to personal data protection, it required member states to ensure that network operators comply with all the security-relevant standards, conduct appropriate security risk assessment and adopt the necessary security measures to guarantee an "adequate level" (n. 27) of resilience for smart metering systems.

However, it was not until 2016 with the "Clean energy for all Europeans" package that the EU decided to enact more significant interventions. A working group on cybersecurity in the energy sector within the context of the Smart Grid Task Force (SGTF), an advisory stakeholder body of the Commission, was established. Both Regulation (EU) 2017/1938 concerning measures to safeguard the security of gas supply and Regulation (EU) 2019/941 on risk-preparedness in the electricity sector require cyber-attacks and cyber-incidents to be considered when carrying out the respective risk assessments and establishing preventive action plans, emergency plans and electricity crisis scenarios. Regulation (EU) 2019/943 on the internal market for electricity tasks ENTSO-E with the promotion of cybersecurity and empowers the Commission to adopt a network code on technical rules for cybersecurity concerning cross-border electricity flows on which the SGTF working group released a report in June 2019, providing recommendations to the Commission. Moreover, article 25 of Directive (EU) 2019/944 on common rules for the internal market for electricity, requires for the deployment of smart metering systems that their security and data communication must comply with EU security rules on the basis of a cost-proportionate approach.

Lastly, Commission Recommendation (EU) 2019/553 of 3 April 2019 on cybersecurity in the energy sector provides sector-specific guidelines. It identifies main issues concerning cybersecurity and asks the member states to ensure that energy network operators take the necessary preparedness measures. The three addressed issues are:

[143] Commission Recommendation 2012/148/EU of 9 March 2012 on preparations for the roll-out of smart metering systems.

(1) real-time requirements of energy infrastructure components; due to the fact that some elements of energy networks need to react within the blink of an eye, network operators must consider such real-time constraints in their overall security concept and implement the relevant security standards.
(2) cascading effects, i.e. propagated cross-border impacts due to disruptions or outages in a system. the member states are asked to reflect on interdependencies and system flexibility, while establishing a communication network that enables energy network operators to warn relevant stakeholders and to collaborate with them in the event of a crisis;
(3) the co-existence of legacy and state-of-the-art technology; thus, energy network operators must take into account the interactions of old infrastructure which had been designed before cybersecurity concerns and modern equipment.

The progress on the implementation of the Recommendation is tracked within a year after its adoption via the NIS Cooperation Group.

The recent multitude of energy-specific provisions on cybersecurity shows a trend to depart from general considerations and to give more weight to the specific characteristics of the relevant areas. However, most of the adopted acts on cybersecurity for energy so far concern mostly just the electricity sector. It remains to be seen whether the EU dedicates more resources also to other increasingly digitised energy sectors in the future, such as the gas and the heat sector.

CONCLUSIONS

Energy security has gained a lot of scholarly and political attention in recent years due to the fact that the effective functioning of vital societal activities, such as healthcare, economy and transport, is increasingly dependent on energy. Moreover, the challenges of the so-called energy transition require policymakers to address new threats of unpredictable nature and of uncertain extent.

The European Union has also made the energy security paradigm one of its policy priorities and, as a supranational regulatory authority, adopted a legal approach to the topic at hand.

Thus, the purpose of this master's thesis was to show that this legal approach can be divided into several legal dimensions, namely import dependency, network reliability, climate resilience, and cybersecurity. Consequently, it was argued that this shapes the relevant meaning of the paradigm and determines which aspects gain more consideration within the overall policy approach. The work also highlighted the EU's regulatory limits and critically assessed the solutions it enacted to overcome them. For this goal, each dimension was introduced by a political and economic overview on the specific policy context and evaluated by a detailed legal analysis on the effectiveness and impacts of the main legally binding and non-binding acts as well as pertinent case law. Lastly, the single dimensions featured an assessment on the relationship between the EU, its member states and third countries, in particular Russia.

However, as seen in the first chapter, it must be kept in mind that energy security is not a concept that originated from a legal context, but from economic and societal studies. The analysis of the traditional, inductive, abductive and deductive approaches showed that its meaning has been the subject of a multitude of scholarly analyses, but that so far no common agreement on its contents could be reached. With the apprehension of the concept by policymakers, legal aspects merged into the discussion and shaped the further understanding of energy security. In the case of the European Union, this analysis shows that energy security is still predominantly framed in terms of "security of supply".

The main reason for this rather anachronistic understanding of the concept, commonly considered within the traditional definitions, is the wording of article 194 TFEU on energy policy, which declares ensuring “security of energy supply in the Union” one of the goals of EU policy on energy. As a consequence, acts adopted on the legal basis of article 194 TFEU also feature the phrase “security of supply” (for example Regulation (EU) 2017/1938). The EU’s legal powers are further restricted by paragraph 2 of article 194, which safeguards the “Member State's right to determine the conditions for exploiting its energy resources, its choice between different energy sources and the general structure of its energy supply”. The legal dimension on import dependency features the highest amount of legal activity by the EU and represents without doubt the most prominent aspect of EU energy security policy. Given that the importation of natural gas is indispensable for its supply in the EU, it is consequently considered mainly in terms of security of supply. In fact, the EU explicitly refers in the WTO panel report of 2018 to the definition employed by the International Energy Agency, i.e. energy security as "the uninterrupted availability of energy sources at an affordable price" (WT/DS476/R, par. 7.1150), in order to justify its third-country certification measure. However, although officially proclaiming a narrow definition of energy security, the remaining dimensions highlight a more modern approach which concerns also the segments of transmission and distribution. On the one hand, rules on infrastructure standards, congestion management and adequacy assessments ensure the reliability of energy services; on the other hand, provisions on cybersecurity and requirements related to the impacts of climate change strengthen the resilience of existing infrastructure. It is worth noting, however, that these aspects are mostly addressed with reference to the functioning and implementation of the internal energy market. The nexus between energy security and the internal energy market is, indeed, very strong throughout all the legal dimensions and based on the assumption that the full implementation and effective functioning of the latter automatically ensures the former. This was a necessary consequence due to the lack of a specific legal basis on energy before the introduction of article 194 TFEU and because the energy security paradigm only arose in the EU after the development of an internal energy market had already started. However, this assumption did not take

into account potential market failures, legal voids or impacts of the energy transition – like the missing money problem – as a consequence of which the market price of energy does not deliver the appropriate price signals for needed investments in security. The member states, in fact, have retained doubts about the effectiveness of the internal energy market and expressed them also in legal terms with the introduction of capacity mechanisms and incentives for continuity of supply for the electricity sector. Regarding the natural gas sector, the few preventive action plans and emergency plans that have so far been adopted present many shortcomings and some member states strongly approved the Nord Stream 2 project (especially Germany) despite its potential negative implications.

Besides the restrictions in legislative power contained in the treaties, the legal dimensions also exposed several other political and legal limits of the EU in its nature as regulatory authority. In fact, the EU struggled in pursuing its diversification efforts for natural gas due to the complex geopolitical relations in the Caspian region. Of the many proposed pipeline projects only the TAP-TANAP pipelines are effectively being constructed, which bring but only a fraction of the prospected volumes of gas to the EU. As considered, they could even end up delivering more Russian gas after the completion of TurkStream, completely frustrating the policy goal of decreasing dependency from Russia set out by the Commission in its initial strategy on energy security. Furthermore, the EU's regulatory framework on the internal gas market entered in conflict with applicable international trade law, determining the inconsistency of the OPAL exemption decision, the third-country certification measure and the TEN-E measure. Additionally, the first one of these measures, besides consisting in a prohibited quantitative restriction to the import of natural gas from Russia according to article XI:1 of the GATT, was judged invalid, due to the fact that its updated version from 2016 violated the principle of energy solidarity as referred to in article 194 TFEU. According to the General Court, in fact, the principle of solidarity contains a clear legal obligation that requires both member states and EU to avoid the adoption of measures that would affect the interests of one of them in relation to energy security. In respect of Nord Stream 2, the EU pursued a questionable *lex specialis* approach by pushing through an amendment to the Gas Market Directive

which would bind Gazprom to the key principles of the internal energy market also in relation to transmission pipelines from third countries. The associated action of annulment is pending and will likely result in the annulment of the amendment, according to the analysis carried out in chapter 2, section 4.3.3. The legal dimension of network reliability highlighted the debate with the member states on capacity mechanisms and their compatibility with fundamental EU market rules. The EU took a cautious approach by first initiating a Sector Inquiry on state aid, in order to influence the choice in mechanism by the member states. Only in 2019, capacity mechanisms found a restrictive Union-wide discipline, which limited their use to measures of last resort and to specific designs. The chapter on climate resilience, on the contrary, showed difficulties for the EU in establishing a comprehensive framework, be it general or sector-specific. It appears, in fact, that the main reason for this is a misalignment in policy priorities, as current climate change regulation in the EU is mainly concerned with mitigating climate change itself, rather than providing preparedness to its actual impacts. Moreover, the unpredictability and potential unreliability of data make the topic unappetizing to address. Nevertheless, the current interventions are insufficient to guarantee an appropriate level of climate resilience. It remains to be seen whether the recent developments in international law can spur EU action on this matter.

Furthermore, a shift in competences from the member states to the EU can be observed in the energy sector. In primary legislation, the introduction of article 194 TFEU allowed the EU to intrude a traditional and classic part of national energy policy. In respect of secondary legislation, the amendment of the Gas Market Directive in occasion of Nord Stream 2 conferred external energy security competences from the member states to the EU, allowing the latter to have the decisive say on any future agreements with third countries on import pipelines. Regulation (EU) 2019/941 on risk-preparedness in the electricity sector, although following roughly the scheme provided by Regulation (EU) 2017/1938, presented a stricter approach and granted less leeway for national discretion, especially in its solidarity mechanism. Similarly, Regulation (EU) 2019/943 considerably limited the member states' choices in respect of the implementation of capacity mechanisms, giving the Commission full control on necessity and design of

them. Hence, it is clear that a goal of EU energy security is not only keeping Russia at bay, but also taming the EU member states.

Cybersecurity, the final dimension, presents a certain incoherence in the policy approach. In fact, the EU knows and acknowledges the potential cross-border impacts of a cyber-incident or cyber-attack occurring in a member state, but ultimately recognizes a primary responsibility of the member states on the matter. Most of the legal acts on cybersecurity present a soft approach, i.e. consist in Directives, or are even soft law (such as the Recommendations on the coordinated response to large-scale cybersecurity incidents and on cybersecurity in the energy sector). The acquisition of cybersecurity certificates by producers and providers of ICT products, services and processes under the new EU cybersecurity certification framework is merely voluntary. Rather, the EU seems satisfied with requiring minimum security requirements and establishing a wide network of institutions and bodies for coordinative and collaborative purposes. This appears to be a new approach in energy security policy that moves away from a vertical governance model towards a more horizontal one, in which the EU limits itself to set up the institutional context where the various actors can then develop together the necessary policies. Striking is also the consideration of cybersecurity first and foremost as a problem within the more general security and defence policy before recognizing it on an economic level. This appears to be influenced by the framing of energy security in terms of national security.

To conclude, the EU energy security paradigm presents an all-encompassing, multi-disciplinary approach, which will evolve. The multitude of pending questions, legal proceedings and uncertainties will inevitably change the relevant policy contexts and legal factors, which requires future studies on the topic.

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