Special Issue
The Socio-Technical Imaginaries of Energy Transitions and Environmental Justice

FUORI LUOGO

Journal of Sociology of Territory, Tourism, Technology



Guest Editors
Federica Viganò
Monica Musolino
Elisabetta Bucolo

Editor in Chief: Fabio Corbisiero
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Redazione di Fuori Luogo
✉ redazione@fuoriluogo.info
tel. +39-081-2535883

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Aurore Dudka, Johanna Vordemfelde, Vincenzo D'Andrea, Enrico Attila Bruni[1]

Socio-Technical Imaginaries and Citizen Engagement in the Energy Transition: Perspectives from Five Renewable Energy Community Ecosystems in the European Union[2]

Introduction

In light of the European Union's goal of achieving climate neutrality by 2050, and amid recent energy crises and geopolitical disruptions that have reshaped national strategies, there is growing urgency to accelerate the deployment of renewables and decentralized energy systems. This shift has become a key policy priority, supported by financial incentives and emerging technologies. However, energy transitions often falter not only due to technical or economic challenges, but because their social and political foundations are insufficiently addressed. Resistance often stems from overlooked concerns about how energy systems affect society (Sovacool *et al.* 2022), revealing a persistent blind spot: the tendency to prioritize technological solutions while neglecting broader social visions, values, and expectations that condition their acceptance (Wolsink 2018).

To address this gap, Science and Technology Studies (STS) scholars have increasingly drawn on the concept of socio-technical imaginaries, defined by Jasanoff and Kim (2009: 120) as "collectively imagined forms of social life and social order reflected in the design and fulfilment of nation-specific scientific and/or technological projects." This framework offers a powerful lens to examine how conceptual futures are constructed, legitimized, and contested, shaping technology development and uptake (Smith and Tidwell 2016; Sovacool *et al.* 2020).

This lens is particularly valuable for analysing energy transitions, shifting the focus from technical assessments to collective visions that define what a decarbonized society should be, who shapes it, and what roles are envisioned for different actors, especially private citizens (Longhurst and Chilvers 2019). A telling example is the rise of RECs (local collectives that produce, manage, and consume renewable energy) which are often considered to be key instruments for advancing alternative energy futures grounded in decentralisation and sustainability. With over 10,000 new initiatives emerging across Europe, RECs are evolving into socio-political laboratories where competing imaginaries are instantiated and negotiated (Wierling *et al.* 2023). These imaginaries shape how communities envision citizen participation and define what a more equitable, democratic, and territorially grounded energy system might look like (Campos and Marín-González 2020).

Although RECs are supported by a common European legal framework, their implementation varies across local and national contexts (European Parliament 2018; Magni *et al.* 2024). This reflects not only institutional differences but also cultural narratives, norms, and expectations that influence local understandings of participation, governance, and justice (Ceglia *et al.* 2022; Dudka *et al.* 2023). RECs thus generate diverse, locally negotiated forms, revealing that energy transitions are not solely driven by technologies or regulations but are deeply shaped by social imaginaries rooted in lived territorial experiences (Mutter 2019).

This raises a key question: *How do divergent territorial imaginaries shape the development and transformative potential of RECs across Europe?*

To explore this, we draw on a comparative qualitative study (N=28) from the EcoEmpower proj-

1 Aurore Dudka, Department of Sociology and Social Research, University of Trento (Italy), aurore.dudka@unitn.it, ORCID: 0009-0002-3515-1952; Johanna Vordemfelde, Energy and Environmental Centre Allgäu (Kempten, Germany), vordemfelde@eza-allgaeu.de; Vincenzo D'Andrea, University of Trento, Trento (Italy), vincenzo.dandrea@unitn.it, ORCID: 0000-0002-0598-5107; Enrico Attila Bruni, University of Trento (Italy), attila.bruni@unitn.it, ORCID: 0000-0002-4561-0780.

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ect, covering five regional ecosystems in France, Germany, Greece, Italy, and the Czech Republic. Through in-depth interviews, we analyse how RECs articulate visions of future energy systems. Unlike most studies focused on regulation, technology, or economics, our approach foregrounds collective imaginaries and local narratives, offering new insights into the social conditions that shape citizen-led energy transitions.

1. Theoretical framework

1.1. What are social imaginaries?

The concept of socio-technical imaginaries, introduced by Jasanoff and Kim (2009), offers a compelling framework for understanding how collectively imagined futures shape both technological development and societal change. Rather than treating innovation as a neutral or purely technical process, this approach highlights how shared visions of what is desirable, possible, or necessary guide decisions about which technologies to pursue, how they are legitimized, and who is empowered to shape them. As these imaginaries circulate through public discourse, become institutionalized in policies, and materialize in infrastructures, they steer the direction and meaning of socio-technical change.

Starting from a co-productionist perspective, imaginaries also gain traction as they circulate through coalition-building, institutional embedding, and material realization, while still remaining open to contestation, reinterpretation, or displacement. These perspectives highlight the dual nature of imaginaries both as structuring forces that coordinate socio-technical change, and arenas of contestation where competing visions are negotiated and legitimized (Jasanoff and Simmet 2021).

As Rabiej-Sienicka *et al.* (2022) point out, even localized or initially marginal imaginaries can gain performative power as they circulate through levels and contexts. Operating across spatial and institutional scales on local, national, and transnational levels, —socio-technical imaginaries are closely aligned with multi-level frameworks of socio-technical transitions. The "triple re-cycle" model developed by Hoffman *et al.* (2021) illustrates how transformative potential emerges when imaginaries align in three interdependent processes: reimagining, recoding, and reconfiguring. When synchronized, these processes can catalyse structural change and empower new actors. Conversely, imaginaries also help stabilize dominant pathways while rendering alternative futures less visible or viable.

1.2. The role of energy communities in bringing about counter-hegemonic alternatives

RECs play a crucial role in articulating and enacting counter-hegemonic socio-technical imaginaries. Dominant imaginaries, typically propagated by states, corporations, and expert networks, tend to favour centralized infrastructures, technocratic governance, and growth-driven economic models. These hegemonic visions often marginalize alternative perspectives on territory, justice, democracy, technology and energy use (Chilvers and Longhurst 2016; Chilvers and Kearnes 2020).

By contrast, energy communities foster alternative imaginaries that challenge these normative assumptions. At the territorial level, they promote territorial imaginaries grounded in place-based identity, local resilience, and meaningful proximity. These imaginaries emphasize emotional attachment to place and foster local agency in decision-making. Through their justice imaginaries, RECs introduce conceptions of energy as a common good rather than a commodity, emphasizing redistribution, inclusivity, and the right to access and shape energy systems, particularly for marginalized, rural, or low-income groups (Velasco-Herrejon & Bauwens 2020; Dudka *et al.* 2024).

Simultaneously, energy communities cultivate democracy imaginaries that reframe energy governance as a space for deliberation, co-design, and shared control. They elevate citizens from passive recipients to co-creators of energy transitions, and disrupt technocratic hierarchies by legitimizing local knowledge, lived experience, and collective values (Schmid 2022; Tozer & Klenk 2018). These democratic practices manifest in open assemblies, cooperative structures, and direct participation in investment and planning, reclaiming not just energy infrastructures but the political processes that surround them (Nirmal and Rocheleau 2019).

Energy communities reshape energy use imaginaries, shifting attention from abstract metrics of efficiency or peak shaving, to a more relational and reflexive understanding of consumption. Practices such as demand reduction, load sharing, and flexibility are no longer seen merely as technical tasks but as expressions of care, self-sufficiency, participation, and responsibility towards the local community and environment. Energy becomes embedded in everyday life and linked to broader cultural values of restraint, reciprocity, and autonomy (Thomas *et al.* 2020; Tozer and Klenk 2018).

Finally, energy communities also contribute to the reconfiguration of technology imaginaries. Dominant narratives about technological innovation, like those explicating smart grid developments, typically portray users as rational, efficiency-driven actors, thereby marginalizing the more participatory, affective, and collective dimensions of energy engagement (Ryghaug & Toftaker 2016). These imaginaries often reflect masculinist hierarchies and technical authority, reinforcing exclusionary norms and limiting space for public agency and democratic involvement in energy governance (Scharnigg & Martin 2024). In contrast, energy communities challenge these assumptions by conceiving technology not as a neutral tool for optimization, but as something that must be socially embedded, co-designed, and aligned with values of inclusion, transparency, and community control (Coenen and Hoppe 2022).

As such, energy communities function as experimental arenas where dominant imaginaries can be questioned and reconfigured. They offer a relational and politicized approach to energy transition that contests hegemonic norms and opens space for more plural, fair, and democratic energy futures. While grounded in specific local ecosystems (Mutter 2019), these imaginaries are far from being confined to the local level: with adequate support from institutions and policy frameworks, RECs can scale through replication and federation models, embedding alternative values into the broader architecture of the energy transition and promoting pluralisation of energy futures (Levenda *et al.* 2019; Dudka *et al.* 2024).

1.3. Beyond the Blueprint: The Plural Imaginaries of Community Energy

New EU legislation has legitimized RECs and created space for citizen-led initiatives, but formal recognition has also exposed tensions. Despite a shared commitment to local anchorage, participation, empowerment, and justice, RECs have evolved along divergent paths, shaped by national contexts and competing stakeholder narratives (Dudka *et al.* 2023).

In Austria, early debates framed RECs both as democratic drivers of the energy transition, but also as threats to grid stability (Vogler and Wittmayer 2024). Over time, energy companies began portraying RECs as customers, advocating for utility-led models that prioritize technical expertise and streamlined participation, often side-lining more participatory approaches.

In contrast, local governments and small businesses have reconceptualised RECs as tools for territorial revitalization and social cohesion. Rising energy prices and geopolitical tensions have further positioned RECs as instruments of energy sovereignty and distributive justice (Centgraf 2018). Other grassroots examples, like the solar collectives that emerged in Puerto Rico after Hurricane María, demonstrate how energy communities can embody alternative imaginaries rooted in resilience, justice, and mutual aid. However, these efforts have been hindered by structural barriers, including financial exclusion and bureaucratic inertia (Echevarria *et al.* 2023).

These competing imaginaries generate both opportunities and risks. On one hand, their plurality can foster creativity, adaptability, and locally grounded innovation. On the other, they expose RECs to institutional co-option and narrative fragmentation, which can constrain their transformative potential (Christiansen and Carton 2021). Aspirations for deep societal change often collide with a host of internal and external tensions. Internally, disagreements over participation, expertise, and governance structures can weaken inclusivity and erode democratic practices (Islar and Busch 2016). Externally, the emancipatory aspirations of communities must contend with material, legal, and institutional barriers. Regulatory complexity, market pressures, and entrenched interests frequently dilute collective ambitions or divert them from their democratic aims. Notably, the rise of top-down REC models centrally managed by utilities risks reducing citizens to passive recipients of financial benefits, undermining the participatory and redistributive ethos at the heart of energy communities (Ballo 2015).

2. Methodology

2.1. Case Study Overview: Exploring Five Regional Energy Ecosystems

To better understand the development of multiple energy imaginaries and their impact, this article adopts a multi-case study approach based on five regional ecosystems, selected through the EcoEmpower project: the Autonomous Province of Trento (Italy), the Centrales Villageoises network (France), the Allgäu Region (Germany), the Zlín Region (Czech Republic), and Central Greece. These cases offer a diverse and representative panorama of the geographical, institutional, and cultural contexts in which RECs are emerging across Europe. France, through the Centrales Villageoises network, represents one of the most mature ecosystems for RECs. Although the legal framework was only formalized in 2021, citizen-led energy initiatives date back further. As of December 2023, France had 305 active collective self-consumption operations (a 220% increase since 2022), more than 600 projects in development, and 421 initiatives supplying energy to around 1.4 million people. The Centrales Villageoises model, originating in the Rhône-Alpes region, stands out as particularly well structured, with over 70 active cooperatives and recognition at the European level.

The Allgäu region in Germany is also an advanced ecosystem, following a different trajectory rooted in historical continuity. The region has long pioneered renewable energy and citizen cooperatives, with early initiatives dating back to the 2000s in villages such as Wildpoldsried. After a slowdown post-2014, recent reforms have revitalized the sector, with 31 new cooperatives created in 2023, particularly for heating. The REC framework was integrated into the Renewable Energy Act (EEG 2022), defining "citizen energy companies" within strict requirements. However, the lack of a national framework for energy sharing remains a key limitation, and best-practice collaborations often face legal and administrative hurdles.

Central Greece hosts 49 active energy communities involving over 900 stakeholders, within a transforming regulatory landscape. As of late 2023, Greece had 1,689 active communities with a total capacity of 1,178 MW. Law 5037/2023 introduced RECs and CECs, aligning with EU directives. The law caps profit distribution at 20% for supported communities and promotes self-consumption, but implementation remains incomplete due to pending regulations.

Italy has a strong institutional framework but limited implementation. Legislative Decrees 199/2021 and 210/2021 transposed EU definitions, and Ministerial Decree 414 (2023) added a social dimension, requiring surpluses to support non-commercial consumers. Nevertheless, progress remains slow: only 213 RECs are registered, with Trento leading (around 30 PV projects).

The Zlín Region in the Czech Republic reflects an early-stage ecosystem. Legislation in 2024 established CECs and RECs aligned with EU principles. Energy sharing began in October 2024, with

11,096 generation sites and 15,549 customers by April 2025, mostly individual "active customers." Only 24 cooperatives exist nationwide, just four in Zlín. Despite strong PV potential, collective models remain marginal, and governance structures are still emerging.

2.2. Data collection

The empirical material derives from a qualitative methodology cantered on descriptive data collection at pilot sites and semi-structured interviews in each regional context (Table.1). Interviews were conducted either directly by our research team (Greece, Czech Republic, Italy and France) or in some cases with the help of local project partners trained on a shared protocol and supported in the adaptation of the questions and translations when needed (Germany, Czech Republic, and Greece), also with support for the translation and contextual adaptation of the research protocol.
The study adopts a qualitative approach using semi-structured interviews conducted between November 2024 and April 2025. Interviews were held with key actors involved in the pilot initiatives of each ecosystem, primarily heads of energy communities, local institutional representatives, and project coordinators. Each interview lasted between 40 minutes and 75 minutes. The interview was structured around seven core thematic areas, allowing for both comparison and contextualization:
Origins and visions
Citizen participation and governance
Inclusivity and social dimensions
Flexibility and technology
Energy consumption and cultural change
Barriers and obstacles
Policy influence and institutional relations

2.3. Data analysis

All interviews were audio-recorded (with participants' consent), fully transcribed, and analysed using NVivo software. The coding process followed an inductive approach, allowing categories and thematic patterns to emerge directly from the data rather than being predetermined. This method enabled the capture of narrative diversity and the collocation of the meanings attributed to community energy across different contexts, while remaining sensitive to contradictions, nuances, and discursive shifts. Five main categories of socio-technical imaginaries emerged from this process, each encompassing several sub-codes that varied across regional ecosystems, reflecting the specific institutional, cultural, and technological configurations in which the renewable energy communities are embedded (Table 2).

3. Results

3.1. Territorial Imaginary

Across the five ecosystems examined, a variety of territorial imaginaries were observed, shaping how RECs are envisioned, structured, and enacted. In France's Centrales Villageoises, Germany's Allgäu region, and Italy's Trentino, energy communities often draw upon long-standing traditions of local self-organization, where energy is imagined not merely as a commodity but as a *commons*, a collectively managed resource that reinforces local identity, resilience, and territorial solidarity (Int.3.4.8.11).

Historical legacies like the cooperative heritage in Allgäu and Trentino, and anti-nuclear mobilizations in the Drôme (Int.2), lend legitimacy and cultural continuity to these bottom-up initiatives. However, these imaginaries are far from uniform. In the French context, for instance, while energy autonomy remains a strong motivating force for some actors, particularly in the rural or mountainous areas, it is not universally aspired for. The emphasis is more on making society through cooperation and shared governance, rather than retreating into isolated energy enclaves (Int.6).

In Italy, tensions emerge when national regulatory frameworks impose rigid, grid-based boundaries that conflict with local ideas of community and territory. This disjuncture is acknowledged by institutions like the GSE (Gestore dei Servizi Energetici) and has led to efforts to redefine territorial perimeters in ways that better align with existing social ties and community geographies (Int.13). These developments suggest a potential convergence between institutional logic and grassroots spatial imaginaries, signalling a shift towards more socially attuned governance models. Additionally, some projects have faced aesthetic challenges, particularly in areas where there is strong visual and emotional attachment to the landscape (Int.9).

Similarly, in Germany's Allgäu region, the territorial imaginary is shaped by an on-going tension between historical self-governance and landscape preservation. Villages like Wildpoldsried illustrate the success of citizen-led energy transitions, but growing resistance to ground-mounted solar arrays or wind turbines reflects a highly aestheticized and protectionist vision of the territory, especially in rural and tourist zones. This duality underscores how ecological, cultural, and visual values intersect, and occasionally clash, within local interpretations of what constitutes a just and liveable energy landscape.

In Greece exhibits a marked energy commons narrative, but this is complicated by land-use conflicts with private actors. Some technologies (e.g., wind turbines, large solar arrays) are seen as threats to landscape integrity, cultural identity, and rural aesthetics. Citizen-led projects nonetheless act as emotional and social anchors, preserving a sense of territorial belonging in a context of socio-spatial mobility, especially among young people constrained to move to the city (Int.18).

In contrast, the Czech Republic exhibits more fragile or ambivalent territorial imaginaries: here, RECs are shaped largely by EU regulatory pressure, with little grassroots attachment or local integration. Energy communities are perceived less as socially transformative spaces and more as administrative entities, with weak ties to the collective identity.

These cases reveal a continuum of territorial imaginaries ranging from deeply rooted and socially embedded (France, Italy), to externally imposed and weakly internalized (Czech Republic), with hybrid or disputed configurations in Germany and Greece.

3.2. Governance and Participation Imaginary

Across France, Italy, and Germany, energy communities reflect governance and citizen imaginaries that are mutually constitutive, shaping how people engage, govern, and imagine their role in the energy transition.

In France's Centrales Villageoises, participation is shaped by collaborative governance. As one project pilot (Int.1) put it, "*we often say the same thing but in different words, and the added value of the Centrales is to be one of the rare actors able to bring these worlds together*." Rather than being driven by normative ideals of active energy citizenship, engagement follows a pragmatic logic grounded in trust, proximity, and shared local interests. However, citizen involvement remains uneven with strong participation often viewed as a welcome "bonus" rather than a baseline expectation, and sustaining voluntary engagement over time can prove difficult (Int.6).

In Trentino, Italy, well established cooperative traditions support a deep-rooted citizen-based engagement. However, regulatory complexity, administrative opacity, and inflated early ex-

pectations about financial benefits have led to growing disillusionment and distrust toward the REC model, even when strong social and environmental motivations remain (Int.7). While this mismatch has dampened enthusiasm, it has also spurred some creative responses, including inter-municipal territorial pacts and informal governance arrangements, illustrating how local actors can invent new forms of governance to navigate and respond to misleading or unrealistic imaginaries (Int.12.13).

In Germany's Allgäu region, a strong ethic of local responsibility and voluntary engagement shapes both governance and citizen imaginaries. Citizens are imagined, and imagine themselves, as active stewards and decision-makers in decentralized energy systems. However, their capacity to act is often curtailed by fragmented grid infrastructures and inconsistent policy signals, demonstrating that empowerment requires more than just motivation, it also depends on institutional coherence, technical support, and long-term political commitment.

In Greece, energy communities embody a politicized citizen imaginary rooted in resistance to commodification and the defence of energy as a public good: "*Citizens should be active participants, not just consumers — co-designing, co-owning, and contributing to local energy solutions*" (Int.16). Participation is emotionally charged and collective, often involving pedagogical work that reconnects youth who have been obligated to move to larger urban centres, and marginalized actors to the local territory. Governance is hybrid, combining municipal structures with grassroots mobilization, but still faces a lack of trust, particularly due to the behaviour of market actors: "*Even if in the EU regulation it is a benefit for people, big stakeholders try to find their way in.*" (Int.18)

In contrast, the Czech Republic is shaped by a delegated and technocratic governance imaginary, characterized by a perception of limited citizen agency. Participation is minimal, highly individualized, and primarily motivated by financial incentives rather than collective engagement. Citizens are positioned not as co-creators of shared energy futures, but as passive recipients or profit-seeking actors. Energy communities are often perceived as externally imposed models, driven by EU directives rather than local demand, and are seen less as democratic or transformative spaces than as complex administrative constructs, difficult for ordinary citizens to access, implement, or sustain (Int.18/19/20).

3.3. Technological Imaginary

Across the five countries, technological imaginaries in energy communities reveal deep contrasts in how technologies are understood, integrated, and legitimized. In France, the Centrales Villageoises exemplify how energy communities can act as drivers of innovation. However, technologies such as smart meters, EV sharing schemes, or even hydrogen pilots are not embraced for their novelty alone, but for their relevance to the local context and their capacity to support socio-technical experimentation.

In contrast, the development of innovative technologies within energy communities in Italy tends to be more limited, often constrained by a lack of technical capacity. Moreover, while the idea of energy sobriety exists in both settings, France appears to take it further, promulgating it with hands-on workshops and strong value-based commitments. This fosters a more pragmatic, "low-tech" imaginary that emphasizes autonomy and simplicity. Instead in Italy the notion of sobriety is less widespread, but technology tends to gain significance when it enables local adaptation and is embedded within familiar institutions such as schools or social intermediaries: «People don't look at you like you're speaking a foreign language» (Int.11).

In Germany there is strong institutional support for smart technologies and automation, particularly given that energy sharing is expected to require significant technological innovation. This includes the development of dedicated software systems and the widespread adoption of a smart metering infrastructure. However, this enthusiasm is tempered by concerns over bureau-

cratic complexity, increased digital energy demand, and public acceptance, revealing a tension between innovation driven by efficiency and the practical limitations of implementation.
Greece presents a dual imaginary when it comes to energy transition. On one hand, technology is seen as a tool of empowerment and a form of resistance against centralized, extractive models: «It gives more power to people to create and utilise their own energy» (Int.14). In this sense, energy communities are increasingly perceived as actors of innovation, not only implementing projects, but also influencing national energy planning. Notably, in the recent NECP (National Energy and Climate Plan) update, Greek energy communities are envisioned as actors in innovation with an important role to play in demand response mechanisms. On the other hand, despite this progress, widespread concerns persist regarding grid limitations, bottlenecks at the DSO level, and a general lack of technical capacity, especially in rural areas. These concerns reflect imaginaries of technical fragility and vulnerability, where progress is perceived as being obstructed by an out-dated or inaccessible infrastructure: *«We have experienced local blackouts… people don't see the full benefits» (Int*.18) Moreover, cultural factors play a significant role, particularly in rural regions, where there is marked scepticism towards new technologies
The Czech Republic sits at the opposite end of the spectrum: technologies are framed as technocratic necessities, managed externally and temporally postponed to a distant future (e.g., flexibility in 2026), with little room for community agency or cultural integration, while also inspiring significant fears for the development of enabling strategies: «There are a lot of fire accidents with automation». (Int.19).

3.4. Energy use Imaginary

In France, energy communities like the Centrales Villageoises aim to reshape consumption through workshops and local education, for example on the use of smart meters. While these initiatives foster empowerment and awareness, the broader vision of planned energy sobriety, often inspired by the négaWatt scenario, remains only partially realized due to institutional inertia and the persistence of deeply rooted habits. However, the recent energy crisis has contributed to the normalization of energy sobriety, particularly in the public sector, where long-term resilience and price stability are now prioritized over short-term cost savings: «Our tariff ended up being 6% higher per kWh, which meant a 1% increase on the total bill for the municipality. When I offered to renegotiate, the mayor replied: 'No, what matters to us now is stability» (Int.2).
In Trentino, energy use is imagined as territorially interdependent, with an emphasis on aligning consumption to local production cycles. In addition to school-based initiatives, workshops are organized to educate citizens and disseminate practical knowledge, reinforcing a culture of shared responsibility. While sobriety still faces cultural resistance, this combination of intergenerational pedagogy and local engagement shows promise. As one interviewee noted:
«I was amazed—six- or seven-year-old children were asking smart questions. Even the high school students were really engaged, interested in how to use energy intelligently, without waste. That's what matters: not just producing, but consuming consciously».(Int.11)
Germany, by contrast, promotes a more techno-centric imaginary, where energy consumption is often overshadowed by concerns with infrastructure and innovation. Smart meters and automation dominate the discourse within energy communities, while behavioural change and consumption reduction receive limited attention.
In lower-income contexts such as the Czech Republic and Greece, imaginaries tend toward an *environmentalism of condition rather than conviction*: energy use is primarily seen as a private, cost-optimized matter, with little room for collective or ecological values. As interviewees in the Czech Republic put it: «If it's not economical, no engagement», and «People want 30 degrees in their homes… they don't care». (Int.19/20). Price signals remain the primary motivator for behaviour change, often coupled with fears of rebound effects from renewables. In Greece, howev-

er, a more plural imaginary emerges with some energy communities promoting environmental responsibility and collective self-sufficiency, while at the same time having to face the economic difficulties of their country: «When people are struggling with basic needs… they don't have the energy to sort their plastic», while others respond to economic stress through intuitive, necessity-driven behaviours: «Electricity is so expensive… people put the washing machine on at night. But most do it intuitively». (Int.18).

3.5. Energy Justice Imaginary

In France, energy justice is widely acknowledged as an important value, yet remains difficult to translate into concrete action. Citizen-led initiatives like the Centrales Villageoises actively promote energy sobriety and public awareness through educational workshops and participatory foresight exercises. However, the inclusion of vulnerable populations remains largely aspirational. Technical debates, whether to prioritize solar panels based on carbon footprint, national origin, or durability, reveal conflicting visions of what constitutes a just transition. These unresolved tensions point to a fragmented and evolving imaginary, where justice is present in discourse but often lacks the institutional and operational support needed for implementation.

In Italy, particularly in regions such as Trentino, energy justice is deeply embedded in local democratic ideals in reaction to external market actors. Being "just" is closely linked to citizen co-ownership of energy systems, where every resident is envisioned as a producer, decision-maker, and beneficiary. This civic vision is further shaped by a sharp critique of national contradictions, for example the promotion of electric vehicles without a corresponding decarbonisation of electricity. Concrete mechanisms for inclusion like solidarity funds or targeted energy renovations are still at an early stage, hindered by technical and economical difficulties in stabilizing the REC models. Notably, Italian initiatives are beginning to expand the vision of the definition of energy vulnerability in an inflationist context to include "ordinary families" who struggle to pay their bills, offering a more inclusive and realistic interpretation of social justice (Int.13).

In Germany, energy justice tends to manifest more implicitly, through the vision of collective benefits offered by energy communities. Moreover, justice is not always framed as a central principle but is instead embedded in the social and economic fabric of community initiatives. Projects are increasingly seeking to diversify participation beyond the traditional scenario of retired male volunteers by reaching out to youth and families. Nevertheless, the explicit inclusion of the most vulnerable remains peripheral to most initiatives.

In Greece, energy justice is a socio-economic necessity, rooted in a context of widespread energy poverty and institutional fragmentation. Here, energy communities aim to include marginalized groups not as passive recipients of aid, but as active co-creators of energy solutions. Inspired by cooperative principles promoted by networks like REScoop, communities adopt practical, dignity-centred inclusion strategies, like providing childcare to enable participation in assemblies, offering emotional support, and establishing trusted intermediaries. Rather than framing inclusion as charity, these initiatives cultivate a profoundly moral and participatory vision of justice anchored in autonomy and collective resilience: «We use trusted intermediaries like municipalities to preserve anonymity and dignity» (Int.18).

By contrast, in the Czech Republic, energy justice is largely absent from the dominant imaginaries shaping community energy development. Neither energy poverty nor social inclusion appear to be driving forces behind current projects, which is to some extent justified by the absence of energy poverty in this country for the moment. Instead, the focus is primarily on technical autonomy and individual financial return. Vulnerable households face significant barriers to participation, as funding mechanisms often require upfront payments that are inaccessible to low-income groups, further reinforcing their invisibility, while values like equity receive minimal attention from stakeholders.

3.6. Scaling-up Imaginary

In France, energy community scaling-up imaginaries are shaped both by growing institutional engagement, and persistent tensions. Emerging collaborations between national agencies and local initiatives, such as ADEME's incentives for district heating, reflect increased recognition of citizen-led participation. However, recent top-down interventions, including tariff reforms, have sparked friction with grassroots actors, revealing deeper conflicts between centralized governance and local expertise. These tensions are heightened by the state's renewed focus on nuclear power, which risks side-lining citizen-driven renewable efforts both politically and financially. In this context, networks like Énergie Partagée play a key intermediary role, sustaining a counter-hegemonic imaginary centred on cooperation, territorial embeddedness, and energy as a commons. Moreover, prior successes continue to inspire new initiatives: as one interviewee recalls, «We attended the inauguration of the first Centrale Villageoise in Condrieu, and that's when we truly witnessed the strength of a citizen-led momentum.»(Int.1). While early projects were often initiated by local authorities, a shift toward direct resident involvement has reinforced bottom-up governance and grassroots mobilization.

In Italy, the scaling of energy communities is inconsistent. While some initiatives have successfully catalysed replication, in particular through public engagement, youth participation, and local visibility, many small municipalities struggle due to their limited administrative and technical capacities (Int.7). In response, new governance models are emerging, such as diocesan- or cooperative-led communities that pool resources and provide a buffer against the encroachment of private actors. Intermediary institutions, like provincial energy agencies and cooperative federations, play a crucial bridging role, intermediating between local needs and national frameworks, advocating for protective legislation, and promoting civic-oriented scaling strategies (Int.12). Nevertheless, widespread anxieties persist about the institutional mismatch and the risk of losing local control, especially national CERs shaped by market actors. Many local stakeholders describe themselves as either "too small" or "too efficient" to be properly recognized or supported within the existing national policy context (Int.7/9/10).

In Germany, energy communities are embedded within a long-standing tradition of citizen-led renewable energy cooperatives, especially in the solar and wind sectors. However, while early momentum was driven by the Feed-in Tariff (EEG) model and strong grassroots engagement, the scaling-up trajectory has recently encountered friction. The transition to auction-based mechanisms and the rise of professionalized actors have made it more difficult for small citizen initiatives to compete, leading to concerns about a gradual "de-citizenization" of the energy transition. Despite this, Germany still presents one of the most mature ecosystems for community energy in Europe, supported by robust cooperative structures and regional networks. Recent imaginaries of scaling increasingly involve digitalization, sector coupling (electricity–mobility–heating), and the integration of flexibility services through local energy management systems. As the energy transition enters this more complex and data-driven phase, there are also fears that energy communities may be relegated to mere symbolic roles unless specific legal, financial, and technical support is reinstated. The tension between Germany's pioneering identity in community energy and the structural pressures of market liberalization continues to shape imaginaries of what community energy can become.

Greece exhibits a dynamic trajectory for energy community development, marked by growing public confidence in their expansion. Their future is increasingly envisioned not just in terms of energy production, but also as more general partners embracing diversified models that integrate sustainable mobility, energy efficiency, and demand-side flexibility, although measures are still necessary to prevent market capture. As noted by Int.14, over 1,800 energy communities have been established in Greece to date in 2025. Many were created primarily to access funding or fall into instrumental categories, but around 120 stand out as genuinely citizen-driven and inclusive initiatives, a significant and promising statistic for the country. These communities are

progressively entering the mainstream policy landscape, a shift catalysed by the establishment of a national federation that plays a crucial role in advocacy, capacity building, and institutional recognition.

In the Czech Republic, the dominant energy imaginary remains distinctively techno-economic and centralized, shaped by strong support for nuclear power and the urgency of phasing out coal. Renewable energy communities are tolerated but remain peripheral, mostly confined to small-scale solar projects with limited political or structural backing for broader replication. They are often perceived as niche solutions, unlikely to alter the mainstream trajectory: "*If we shut down nuclear power plants, we won't need energy communities*" (Int.20). Scaling efforts face multiple constraints, including weak policy support and limited peer exchange. Most pilot projects operate within the "active customer" model, with little citizen empowerment. In regions like Zlín, where over 80% of electricity is imported, the focus remains on securing generation capacity, and resistance to wind and large-scale solar infrastructures further restricts local renewable development. Despite this, some actors express cautious optimism, seeing current efforts as valid starting points, with potential for more ambitious, community-led models if institutional learning and policy experimentation can be enhanced (Int.20).

4. Discussion and Conclusion:

Our analysis of six socio-technical imaginaries associated with RECs across five European ecosystems (France, Italy, Germany, Greece, and the Czech Republic) reveals significant variation in how these initiatives are conceptualized, supported, and experienced. As illustrated in Graph 1, we employed a qualitative scale from 1 (weak, absent, or externally imposed imaginaries) to 5 (strong, embedded, and operational). A key insight emerging from this comparison is that, beneath the appearance of a unified vision of what RECs should be, there is a plurality of imaginaries shaped by distinct national histories, political cultures, and socio-economic conditions. This diversity underscores the fact that fostering citizen engagement in energy transitions cannot rely on standardized policy templates, but instead requires sensitivity to context-specific imaginaries and local trajectories, in other words the culturally and historically embedded ways in which energy is perceived and valued, whether as a commons, a right, and/or a commodity.

In France and Italy, for example, a relational approach, in which energy projects are directly tied to tangible community benefits such as schools or electric mobility for families, has proven effective.

In contrast, the Czech Republic presents a distinct challenge. Civic trust tends to be lower, and the concept of "community" remains ambivalent, shaped by the legacy of the socialist era, when collective structures were often imposed from above. As a result, approaches that succeed in more community-oriented contexts, could fail completely. As one interviewee pointed out, people are more inclined to donate to causes like helping the sick rather than investing in energy communities, which are often perceived as abstract, distant, or overly technocratic. This makes it crucial to re-signify these financial transactions, connecting them to values that resonate locally,, like solidarity, care, or intergenerational responsibility. An example is provided by some young volunteers in Croatia who help energy vulnerable elderly people to adopt new energy practices. At the same time, regulatory frameworks need to be reformed to enable, rather than hinder, citizen participation. When engagement is constrained by bureaucratic complexity or unappealing financial returns, it becomes difficult for energy communities to scale. As one interviewee put it: *"If a project doesn't offer a fair economic return, why would anyone join? And once you start sharing energy, the pricing structure changes—distributors can apply different tariffs that actually discourage participation.*" Such observations underscore the need for regulatory environments that not only remove barriers but actively foster a sense of opportunity and fairness. By doing so,

they can help cultivate positive imaginaries around participation, framing energy sharing not as a burden or risk, but as an accessible and meaningful form of collective action.
In countries where RECs lack historical precedent or institutional support, and where technological innovations may be met with scepticism or fear, developing engagement requires long-term cultural work. This includes not only regulatory and financial tools, but also pedagogical initiatives, storytelling, and the cultivation of shared narratives around energy justice, cooperation, and agency. Establishing a culture of energy transition takes time, but it is foundational for making energy communities both resilient and socially transformative.
Finally, we must move beyond idealized portrayals of the "energy citizen" as always informed, proactive, and ecologically motivated. Engagement in energy transitions is neither universal nor automatic, it is contextual, contingent, and shaped by everyday constraints, lived experiences, and socio-cultural reference points. Recognizing this diversity is essential for designing inclusive, meaningful, and durable pathways for citizen participation.

Graph 1: Comparative perspective of social imaginaries:

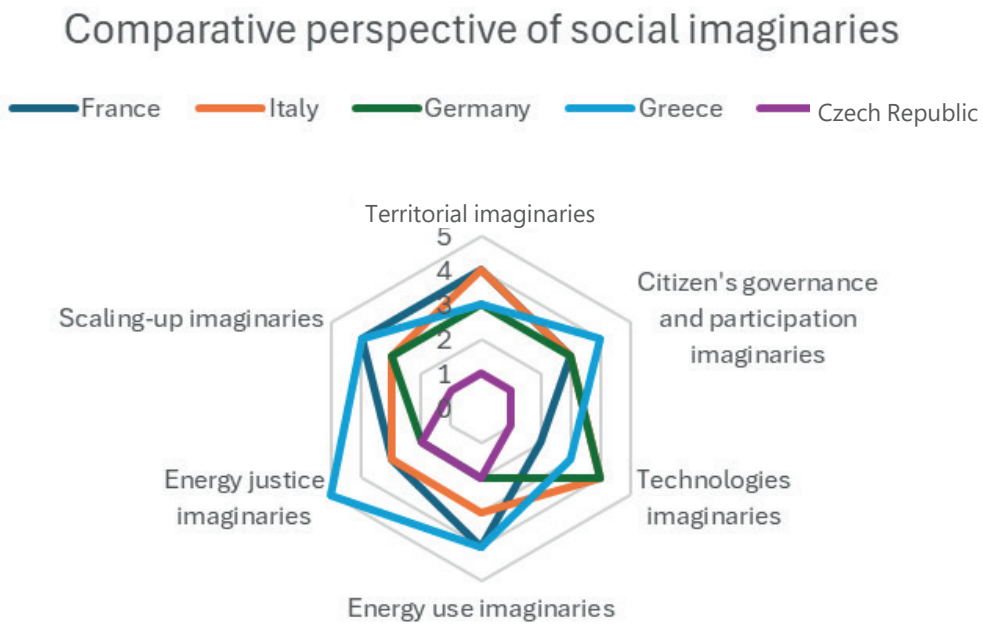


Table 1: List of interviews

List of interviews		
Country	**Actor type**	**Number**
France	Pilot site1	1
	Pilot site 2	2
	Pilot site 2	3
	Pilot site 3	4
	Institution	5
	Institution	6
Italy	Pilot site1	7
	Pilot site 2	8

	Pilot site 3	9
	Pilot Site 3	10
	Consortium	11
	Institution	12
	Ecosystem actor	13
Greece	REScoop Expert for Greece	14
	Pilot site1	15
	Pilot site 2	16
	Pilot site 3	17
	Institution	18
Czech Republic	Institution	19
	Institution	20
	Institution	21
	Pilot site 1	22
Germany	Pilot site1	23
	Pilot site 2	24
	Pilot site 3	25
	Institution	26
	Institution	27
	Institution	28

Table 2: Coding list

France	Italy	Germany	Greece	Czech Republic
1. Territorial Imaginary				
Energy as a tool for territorial development	Energy as territorial infrastructure (especially in remote/ mountainous areas)	Land-use conflict (tourism)	Land-use conflict (agriculture/private companies)	Externally driven model (EU-funded)
Local identity and place-based governance	Local identity and place-based governance	Cooperative legacy and territorial embeddedness	Aesthetic integration of renewables	Weak territorial anchoring
Anti-nuclear sentiment (implicit)	Cooperative legacy (historical)	Aesthetic appreciation of renewables	Nature protection	Disconnection from territorial development
Strategic ambition for multi-technology deployment	Regulatory misalignment with local technical configurations	Nature protection	Youth mobility	Lack of long-term territorial integration
Aesthetics of renewable energy	Aesthetics of renewable energy	Emotional attachment to place		

2. Governance and Participation Imaginary				
Mixed governance (public–civic–private)	Civic energy tradition	Fragile local governance	Commons-based vision	Delegated or external governance
Energy citizenship questioned	Exit and demotivation	Volunteerism under strain	Strong citizen ownership	Market-driven participation
Outcome-oriented approach	Collective benefit logic	Emphasis on transparency	Mixed governance (public–civic–private)	Low citizen recognition
Risk of market drift	Weak provincial support	Top-down governance tensions	Market resistance	Individualised and transactional engagement
3. Technologies Imaginary				
Pragmatic innovation (EV sharing, local systems)	Constrained innovation capacity	Tech as burden (digitalization, automation)	Tech for autonomy and resistance	Top-down deployment
Tech serving social needs	Tech–society connection	Energy paradox (automation vs. behaviour)	Social usability focus	Misalignment with daily rhythms
Integration with place-based scales	Spatial governance constraints on grid	System optimization logic	Innovative corporate deployment	Risk and safety concerns
Place of socio-technical experimentation	Latent innovation interest	Automation for efficiency	Embedded, user-led solutions	
4. Imaginaries of Energy Use				
Crisis transforming consumption practices	Lack of models and foresight tools	Techno-centrism over behaviour	Condition and conviction	Behavioural change seen as marginal
Lack of models and foresight tools	Pedagogical efforts (schools)	Automation over sobriety	Sobriety and adaptability	Rebound effect, lack of sobriety
Emerging norm of energy sobriety	Mixed reception of sobriety	Absence of sobriety focus	High adaptive capacity	Energy as commodity
5. Justice and Inclusion Imaginary				
Equity acknowledged but weakly operationalized	Justice as co-ownership	Justice embedded but implicit	High energy poverty, strong autonomy claim	Justice largely absent
Limited inclusion of vulnerable groups	Solidarity-based redistribution	Demographic diversification	Not framed as charity	No energy poverty definition
Differentiated views on justice	Expanded view of energy poverty	Vulnerability peripheral	Empowerment logic	Exclusionary by design

6. Scaling-up Imaginaries				
Tension: technocracy vs. local knowledge	Weak coordination, selective replication	Shift from grassroots to market	Diversification and policy entry	Blocked by nuclear-centric model
National networks as enablers	Provincial pooling and mutualisation	Legal/market barriers	Risk of co-optation	Fragile pilots
Diversification and policy entry	Institutional mismatch	Symbolic relegation risk	Growing national recognition	Focus on active customers, not ECs

References:

Ballo, I. F. (2015). *Imagining energy futures: Sociotechnical imaginaries of the future smart grid in Norway*. *Energy Research & Social Science, 9*, 9–20. https://doi.org/10.1016/j.erss.2015.08.015

Campos, I., & Marín-González, E. (2020). *People in transitions: Energy citizenship, prosumerism and social movements in Europe*. *Energy Research & Social Science, 69*, Article 101718. https://doi.org/10.1016/j.erss.2020.101718

Centgraf, S. (2018). *Supporting civic engagement in German energy cooperatives: Transdisciplinary research based on the reflection of individual needs*. *Energy Research & Social Science, 44*, 112–121. https://doi.org/10.1016/j.erss.2018.05.003

Chilvers, J., & Kearnes, M. (2020). *Remaking participation in science and democracy*. *Science, Technology, & Human Values, 45*(3), 347–380. https://doi.org/10.1177/0162243919850885

Chilvers, J., & Longhurst, N. (2016). *Participation in transition(s): Reconceiving public engagements in energy transitions as co-produced, emergent and diverse*. *Journal of Environmental Policy & Planning, 18*(5), 585–607. https://doi.org/10.1080/1523908X.2015.1110483

Christiansen, K. L., & Carton, W. (2021). *What "climate positive future"? Emerging sociotechnical imaginaries of negative emissions in Sweden*. *Energy Research & Social Science, 76*, Article 102086. https://doi.org/10.1016/j.erss.2021.102086

Coenen, F. H. J. M., & Hoppe, T. (2022). *Renewable energy communities as a new actor in home energy savings*. *Urban Planning, 7*(2), 108–122. https://doi.org/10.17645/up.v7i2.5088

Dudka *et al.* (2023). *A typology of community-based energy citizenship: An analysis of the ownership structure and institutional logics of 164 energy communities in France*. *Energy Policy, 178*, Article 113588. https://doi.org/10.1016/j.enpol.2023.113588

Echevarria *et al.* (2023). *Unleashing sociotechnical imaginaries to advance just and sustainable energy transitions: The case of solar energy in Puerto Rico*. *IEEE Transactions on Technology and Society, 4*(3), 255–268. https://doi.org/10.1109/TTS.2022.3191542

European Parliament. (2018). *Directive (EU) 2018/2001 of the European Parliament and of the Council of 11 December 2018 on the promotion of the use of energy from renewable sources*.

Hoffman *et al.* (2021). *Working to align energy transitions and social equity: An integrative framework linking institutional work, imaginaries and energy justice*. *Energy Research & Social Science, 82*, Article 102317. https://doi.org/10.1016/j.erss.2021.102317

Islar, M., & Busch, H. (2016). *"We are not in this to save the polar bears!": The link between community renewable energy development and ecological citizenship*. *Innovation: The European Journal of Social Science Research, 29*(3), 303–319. https://doi.org/10.1080/13511610.2016.1188684

Jasanoff, S., & Kim, S.-H. (2009). *Containing the atom: Sociotechnical imaginaries and nuclear power in the United States and South Korea*. *Minerva, 47*(2), 119–146. https://doi.org/10.1007/s11024-009-9124-4

Jasanoff, S., & Simmet, H. R. (2021). *Renewing the future: Excluded imaginaries in the global energy transition*. *Energy Research & Social Science, 80*, Article 102205. https://doi.org/10.1016/j.erss.2021.102205

Longhurst, N., & Chilvers, J. (2019). *Mapping diverse visions of energy transitions: Co-producing sociotechnical imaginaries*. *Sustainability Science, 14*(4), 973–990. https://doi.org/10.1007/s11625-019-00702-y

Magni *et al.* (2024). *How national policies influence energy community development across Europe? A review on societal, technical, and economical factors*. *Energy Conversion and Management: X, 23*, Article 100624. https://doi.org/10.1016/j.ecmx.2024.100624

Mutter, A. (2019). *Mobilizing sociotechnical imaginaries of fossil-free futures: Electricity and biogas in public transport in Linköping, Sweden*. *Energy Research & Social Science, 49*, 1–9. https://doi.org/10.1016/j.erss.2018.10.025

Nirmal, P., & Rocheleau, D. (2019). *Decolonizing degrowth in the post-development convergence: Questions, experiences, and proposals from two Indigenous territories*. *Environment and Planning E: Nature and Space, 2*(3), 465–492. https://doi.org/10.1177/2514848618819478

Rabiej-Sienicka *et al.* (2022). *Let it flow, our energy or bright future: Sociotechnical imaginaries of energy transition in Poland*. *Energy Research & Social Science, 89*, Article 102568. https://doi.org/10.1016/j.erss.2022.102568

Smith, J. M., & Tidwell, A. S. (2016). *The everyday lives of energy transitions: Contested sociotechnical imaginaries in the American West*. *Social Studies of Science, 46*(3), 327–350. https://doi.org/10.1177/0306312716644534
Sovacool *et al.* (2020). *Sociotechnical agendas: Reviewing future directions for energy and climate research*. *Energy Research & Social Science, 70*, Article 101617. https://doi.org/10.1016/j.erss.2020.101617
Sovacool *et al.* (2022). *Conflicted transitions: Exploring the actors, tactics, and outcomes of social opposition against energy infrastructure*. *Global Environmental Change, 73*, Article 102473. https://doi.org/10.1016/j.gloenvcha.2022.102473
Thomas *et al.* (2020). *Energy justice discourses in citizen deliberations on systems flexibility in the United Kingdom: Vulnerability, compensation and empowerment*. *Energy Research & Social Science, 66*, Article 101494. https://doi.org/10.1016/j.erss.2020.101494
Tozer, L., & Klenk, N. (2018). *Discourses of carbon neutrality and imaginaries of urban futures*. *Energy Research & Social Science, 35*, 174–181. https://doi.org/10.1016/j.erss.2017.10.017
Velasco-Herrejon, P., & Bauwens, T. (2020). *Energy justice from the bottom up: A capability approach to community acceptance of wind energy in Mexico*. *Energy Research & Social Science, 70*, Article 101711. https://doi.org/10.1016/j.erss.2020.101711
Vogler, A., & Wittmayer, J. M. (2024). *Mainstreaming storylines of a social innovation: The case of energy communities in Austria*. *Environmental Innovation and Societal Transitions, 53*, Article 100901. https://doi.org/10.1016/j.eist.2024.100901
Wierling *et al.* (2023). *A Europe-wide inventory of citizen-led energy action with data from 29 countries and over 10000 initiatives*. *Scientific Data, 10*(1), Article 9. https://doi.org/10.1038/s41597-022-01902-5
Wolsink, M. (2018). *Social acceptance revisited: Gaps, questionable trends, and an auspicious perspective*. *Energy Research & Social Science, 46*, 287–295. https://doi.org/10.1016/j.erss.2018.07.034