

Combining the multilevel perspective and sociotechnical imaginaries in the study of community energy: two case-studies from Italy

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Abstract

The current paper aims to contribute to the literature on community renewable energy by considering two projects developed in the north-west of Italy, in the Piedmont region. The case-studies are analysed by combining two theoretical perspectives: the multilevel perspective and the sociotechnical imaginary approach. On the one hand, applying the first perspective helps reconstruct the context and circumstances that have permitted Piedmont's energy community projects to emerge. In particular, attention is given to the windows of opportunity created by the passing of the Milleproroghe decree at the national level and by the ensuing regional law 12/2018, which acknowledged the establishment of energy communities in the Piedmont. On the other hand, the sociotechnical imaginary approach allows identifying collective ideas and meanings that emerge when individuals or groups promote a sociotechnical innovation. In our cases, two main future changes are associated with community renewable energy: an integral ecology approach and a stronger sense of community on the one hand, and local development opportunities for rural areas characterised by depopulation, low employment rate and high energy demand, on the other.

Keywords: community renewable energy; sociotechnical imaginary; multilevel perspective; energy transition

1.Introduction

A growing literature [1,2,3,4,5] points out that greater direct involvement of society in the production and distribution of renewable energy is a necessary condition for making progress in energy transition.

In this regard, scholars [6] propose the concept of grassroots innovation to describe “innovative networks of activists and organisations that develop bottom-up solutions for sustainable development; solutions that respond to the local situation and the interests and values of the communities involved” (p. 585). There are many examples of grassroots innovation in the energy sector. Among them, a leading role for academic research attention and social diffusion is covered by collective projects, which manage and produce renewable energy, promoting an idea of an active and technically competent public and adopting an ethic of mutual help. The innovative nature of these experiences is related to the fact that they give rise to practices of management, production and distribution of renewable energy that diverge from traditional organisational models centred on the market or the state. By decentralising the energy systems and putting citizens at the centre, these initiatives are considered to foster forms of democracy [7].

Several terms are used in various countries: *Énergies Partagées* in France, *Bürgerenergie* in Germany and *Community Energy* in the United Kingdom. These are all names used to indicate a new relationship between society and its energy system. Among these terms, *Community Energy* or *Community Renewable Energy (CRE)* is the most widespread in the international academic debate.

To define this diverse and dynamic domain, some scholars [3] stress the importance of jointly considering processes and results. Therefore, they propose to consider as CRE all those projects that, in varying degrees, are developed or managed through an open and participatory process and produce local and collective benefits. According to some [8], CRE can be defined as all those initiatives activated by citizens of a formal or informal type, which propose collaborative solutions to facilitate the development of energy sustainability technologies on a regional basis.

As already highlighted [9], these projects can take diversified organisational and legal forms: from cooperatives owning energy infrastructures – the most widespread model – to non-profit entities that manage the plants on behalf of the local community, to co-ownership of green energy projects by communities, businesses and local governments. CRE can function as energy producers, as suppliers or combine these areas to promote energy-saving projects. Moreover, as researchers [4] [10] pointed out, they can be based on local communities or communities of interests.

The breadth of the definition of CRE, deriving from the complexity of the very concept of community, has been problematised by various authors [11, 12, 13]. On the positive side, it was highlighted that the adoption by project proponents – and in part also by researchers – of a loose definition of CRE guarantees community actors the flexibility to develop initiatives that are adequate and sensitive to the needs and characteristics of local communities [14, 15]. On the negative side, it was underlined how a too-broad definition of CRE risks losing sight of the principles of sustainable community development and energy democracy – aspired by many projects – or even legitimising forms of business as usual type of development [16].

To solve the inherent problematic nature of the community's concept, some authors [17, 18, 7] propose replacing CRE with the analytical term “collective and politically motivated renewable energy projects”. This term gives particular importance to the “political” element. Some [7] believe that civil society initiatives on energy often have an agenda of aspirations beyond electricity generation and usually address a “politics of the possible”, which seeks to use the limited room to manoeuvre a gradual change in the organisation of society. Key objectives that characterise these forms of collective action are a general reduction in energy consumption, the protection of biodiversity, more sustainable agriculture, more significant social equity, and disadvantaged groups' empowerment.

On the one hand, sociological literature [19, 16, 13, 4, 5] generally agrees in attributing economic, social and environmental advantages to community initiatives on renewable energy that distinguish them from governmental or company-led initiatives. In particular, scholars [18] have suggested the potential of CRE in democratising renewable energy production. However, the growing popularity of the term “energy community” in the political discourse points out the risk that these forms of civil society participation, rather than expressing instances of change, can be functional to capital needs as they end up weakening political conflict.

As researchers [10] have highlighted, most research on community renewable energies focuses on northern central European countries; instead, a limited amount has considered southern European countries, even though they are affluent in renewable energy sources. Our contribution aims to address this literature gap by focusing on two case studies from northern Italy.

The article is organised as follows. Section 2 illustrates the research's theoretical framework based on combining two approaches: the multilevel perspective (MLP) and sociotechnical imaginaries. Section 3 then applies this theoretical framework to understand the innovation process around two energy communities in Piedmont. Finally, Section 4 draws some general conclusions from the case studies.

2. Theoretical framework, materials and methods

The following paragraphs illustrate the research's theoretical framework, based on the combination of the multilevel perspective (MLP) and the sociotechnical imaginaries literature. Our paper uses both of these to analyse two energy community projects developed in the north-west of Italy, in the Piedmont region.

2.1 The multilevel perspective

The MLP represents an analytical tool used by researchers to simplify reality and identify innovations' dynamics [20]. The MLP model is articulated around three analytical levels, i.e. the landscape (macro-level), the regime (meso-level) and the niche (micro-level) [21]. All these three layers are interdependent; hence when an event occurs, it generates an impact on the next level in the form of new circumstances, which can represent disadvantages and/or opportunities for individuals. Because the "regimes are embedded within landscapes, and niches within regimes" [22], the multilevel system is considered "as a nested hierarchy" (p.1261) [23].

The macro-level represents the broad context where people's actions and activities occur, which generates transformations both in the regime and the niche. In response to pressures from the landscape, the meso-level may remain stable or endure unexpected changes. Simultaneously, the micro-level actors may take advantage of the window of opportunity derived from the regime destabilisation and nurture innovations, which may become dominant and temporarily transform the pre-existing regime. However, the technological novelties fostered by niche actors are not yet integrated within the system; thus, they coexist with previous technologies for some time and influence them. The influence of the landscape on the niche actors' activities reflects the existing influence between society and technology.

Each layer of the MLP corresponds to a different level of reality. Specifically, the landscape represents the contextual environment made of processes and factors that influence people's existence within society. For instance, macroeconomics, macropolitics and societal structures drive individuals' choices and define their activities worldwide. Those events have the characteristic of being long-lasting, which means they change very slowly over time (e.g. climate change, demographic shifts) [24]. The macro-level produces significant transformations on the regime and the niche, albeit its effects are only evident over a long time.

The meso-level consists of official rules, institutions and technologies that define different social groups' existence and activity. Examples are technical elements, like resources and grid infrastructures, regulations, behavioural norms and guiding principles. Scholars [25] agree that the regime endures locked in and path dependency. In other words, it follows predictable mechanisms and trajectories that prevent changes from happening. However, external factors can pressure the regime and create unexpected changes, opening windows of opportunity for innovations.

The actors of the micro-level can take advantage of these changes and nurture novelties, such as new technologies. When this happens, the niche starts acting like an "incubation room" where actors' small networks shield new technologies from external economic influences. In this way, innovations emerge and become elements that pressure the existing system until changes happen.

2.2 The sociotechnical imaginaries

The sociotechnical imaginaries' perspective recalls the concept of imagination that some scholars [26, 27] have defined as a social practice inasmuch as it can help visualise possible futures that individuals expect and wish to realise [28]. A social imaginary "makes possible common practices and a widely shared sense of legitimacy" [29]. Accordingly, our social structures exist thanks to collective practices, stories and ideas shared by people. Social imagination is so powerful it can legitimise actions and thoughts into shared habits and values. Besides institutions, these visions can

also arise around concrete objects to which individuals ascribe different meanings.

For instance, technology has a social significance that moves beyond its practical purposes. Instead of just being technical tools, technologies can symbolise the social expectations of individuals or groups that decide to develop them. Indeed, the sociotechnical imaginaries are “collectively imagined forms of social life and social order reflected in the design and fulfilment of nation-specific scientific and/or technological projects” (p.120) [28]. Technological novelties might facilitate the building of a new society, which aims, for instance, to meet people’s needs and improve their living standards. In doing so, technology becomes a vehicle of sense and the means through which people fulfil their aspirations.

Imaginaries might originate from the vision of a single individual who transfers them to others. Once shared and accepted, they become collective imaginaries that usually aim to create positive forthcoming progress possibilities [30]. Because they engage collective actors, which nurture and share them, sociotechnical imaginaries are also political tools. They can represent the legitimization of communities and nation-states, which use them to justify their power [31]. Sociotechnical imaginaries can drive the states’ decisions towards the expected futures they wish to realise. Accordingly, visions and aspirations can shape the policies that define the use of technologies, who will benefit from them, the individuals to exclude and the possible risks to consider. In other words, they can include or ban specific groups or individuals from the technologies’ benefits [32].

National states can employ sociotechnical imaginaries, but they are not the only ones. Other groups, such as “corporation, social movements and professional societies”, can produce their imagined futures and actualise them [30]. Sociotechnical imaginaries are powerful tools in connecting and involving individuals.

Indeed, creating a collective imagination is a robust method to establish public engagement, representing a significant symptom of democracy and general satisfaction [33]. There is a proven connection between individuals’ participation and their positive perceptions of technologies [34, 35]. When the promoters decide to include different actors in establishing a novelty, individuals are more likely to accept them and perceive themselves as an active part of the project. Usually, public involvement derives from communication, consultation and participation [36], managed by a specific initiative’s promoters.

Building a sociotechnical imaginary may take some time. Also, the effects might become evident only after a long time. However, they play a socially valuable role in driving technologies’ promotion – in particular renewable energy technologies supporting energy communities.

2.3 Methods

The paper investigates Pinerolo and Valle Maira’s energy community projects at their initial planning phase, analysing the MLP levels and the sociotechnical imaginaries – e.g. people’s expectations of and aspirations for the initiatives – which allow the energy communities to emerge.

The choice to study these two initiatives derives from their connection with the innovative Piedmont’s transposition of the European Directive 2018/2001 into the Regional Law 12/2018. Implementing the Directive at the regional level for the first time in Italy allowed local actors to propose their energy community projects before Italy issued its national law on energy communities.

At the same time, the territory involved in Pinerolo’s and Valle Maira’s initiatives has a long tradition of electricity production from local renewable resources. At the beginning of the twentieth century, Piedmont was one of the first Italian regions to build an energy cooperative based on hydroelectric power plants’ electricity production. Accordingly, Pinerolo’s and Valle Maira’s intention to adopt the energy community model is connected to an innovative and sustainable oriented social context.

With the support of the MLP and the sociotechnical imaginaries’ perspective, our study tries to answer the following research questions:

- What was the context in which Piedmont's energy communities emerged?
- How did local civil society understand and envision the establishment of energy communities?

The MLP frames the local actors' intention to establish the two energy communities, thus answering the first question. On the other hand, the sociotechnical imaginaries perspective helps describe the shared futures associated with the two renewable energy projects.

The paper uses a qualitative methodology of semi-structured interviews conducted online between May 2020 and February 2021. The research was developed during the global outbreak of COVID-19, which has interfered with human activities and affected the chance to undertake fieldwork and get information directly from the communities involved. Although the circumstances were not ideal, it has been possible to interview the main actors involved in developing the two energy community projects.

In particular, with regard to Pinerolo's energy community, we interviewed first of all the key initiator, i.e. a university professor from University of Turin. In addition, we interviewed a representative of Acea Pinerolese S.p.A., a multi-utility that funded the Consorzio Pinerolese Energia (CPE), namely an organisation comprising more than 400 local companies and associations to promote a new local energy production and consumption system. Among the actors belonging to the CPE, we interviewed: Pinerolo's bishop, a representative of the local labour union (CGIL) and the president of the Waldensian Diaconia of the Valleys.

Regarding the case study of Valle Maira's energy community, the initiators belong to the Mountain Union. Accordingly, we interviewed the following Mountain Union's actors: the president, the director of the Environment and Territory Department and one assessor. In addition, we interviewed the CEO of the Agency of Vocational Education, representing the forthcoming energy community's economic office, and the president of Maira S.p.A., owner of the energy community's technology.

The following section describes Pinerolo and Valle Maira's energy community case studies, applying the multilevel and the sociotechnical perspective.

3. Results

3.1 Applying the MLP to understand the context

As outlined above, the MLP focuses on three specific levels: the landscape (macro-level), the regime (meso-level), and the niche (micro-level). They constitute the research's analytical structure and help understand the circumstances that have enabled Piemonte's energy community projects to emerge.

In the present paper, the macro-level mainly consists of the climate crisis and its effects on the natural and social dimensions. This level also includes social changes, such as transformations in politics, culture, worldviews (e.g. globalisation, individualism) and economics. Here, long-term social changes are slow and hard to modify in the short run by external factors of other levels. Among those changes, there are attempts by the most industrialised countries to address gas emissions through several political measures over the decades (e.g. Our Common Future, Kyoto Protocol, Paris Agreement). The consequent worldwide demonstrations (e.g. Friday for Future) show an intense cultural transformation regarding the perception of production and consumption in contemporary society.

As mentioned previously, the landscape acts as a significant force that influences the events of the lower levels. In response to the growing international interest in sustainability and circular economy, the meso-level experienced several changes over time. In particular, the EU member states introduced new regulations, laws and subsidies in favour of an energy system increasingly based on renewable technologies. Among the measures, the European Directive 2018/2001 allows European citizens to establish energy communities to produce, share and store renewable energy.

In Italy, the National Energy Strategy (*Strategia Energetica Nazionale*, SEN) sets sustainable goals, such as improving competitiveness and decreasing CO₂ levels by 2030. To reach these objectives, the SEN advocates developing renewable energy resources, energy efficiency and energy security. In February 2020, Italy issued the “Milleproroghe” decree as a preview of the European Directive’s transposition, allowing Italian regions to build energy communities. Although Italy will formally adopt the Directive by June 2021, the Millepropoghe decree aims to encourage energy communities’ establishment before the official implementation date. After June 2021, Italy will officially implement the Directive and clarify the new incentives.

As a result of the regime’s adjustments to the landscape, windows of opportunity may emerge, and niche actors might pressure the existing rules and institutions by introducing innovations that meet their necessities. That occurred in 2018 in Piedmont, with the issuing of the Regional Law 12/2018, which allows the establishment of energy communities in the region. The promoter was a professor and environmentalist from the University of Turin who aimed at fostering a renewable energy community in Pinerolo. Thanks to Piedmont’s Regional Law, the Valle Maira Mountain Union’s members also decided to develop a community model of renewable energy consumption and production.

3.2 Analysing sociotechnical imaginaries

While the MLP helps to analyse the broad context that allows sociotechnical transitions to arise and identifies the niche level as novelties’ cradle, the sociotechnical imaginaries’ perspective focuses specifically on the motivations behind technology promotion. In particular, it explains how niche actors decide to organise energy community projects for promoting renewable technologies in their territory.

Collective imaginaries support the creation of shared ideas of different societies. People use them to project their aspirations for a better existence on innovations, wishing their needs to be fulfilled by technologies. Since advocates usually associate them with concepts like progress and wealth, it is easier for a community to accept new technologies in its territory.

Sociotechnical imaginaries develop when individuals or groups promote the novelty’s implementation while picturing new futures for society. They “are powerful cultural resources that help shape social responses to innovation” [32]. They gather people’s diverse ideas, knowledge and meanings to fulfil their social and practical needs through technology. In the process of becoming dominant, the sociotechnical imaginaries might need a “grand narrative” [37] that boosts the role of decentralised renewable energy technologies in local initiatives.

In this paper, the sociotechnical imaginaries perspective helps us to understand why Pinerolo and Valle Maira’s actors encouraged energy community initiatives and what images citizens built around them.

This perspective helps to delve into the motivations behind the promoters’ intention to establish energy communities in Pinerolo and Valle Maira and the consequent civil society’s perception.

By analysing the interviews, it has been possible to identify two main future changes that the actors involved allocate to establishing the energy communities: a stronger connection between humans and nature and a sense of community, on the one hand, and a more just territorial development, including the support of the most vulnerable population groups, on the other. The following sections present the results for each theme.

3.2.1 Integral ecology and sense of community

Regarding the Valle Maira's case study, the energy community's primary electricity producers are two organisations, namely Maira S.p.A. and the small town of Dronero. The first one is a local private–public company pioneer in generating electricity from renewable resources (i.e. water), supplying the entire valley for decades. After being founded in 1998 by private and public capitals, it committed to building two hydroelectric power plants in the area. The second energy producer is the municipality of Dronero, which owns a local hydroelectric power plant. In particular, Maira's projected energy community will rely on three hydroelectric power plants: 3.1 MW, 1.9 MW, and 0.45 MW, producing 1.5 MWh per year for Valle Maira.

The Valle Maira Union aims to use the valley's existing technology to foster a project that allocates energy to the citizens in a more environmentally friendly way.

The president of Valle Maira Union identifies the concept of “integral ecology” of the Pope's encyclical “*Laudato si'*” (2015) as the main inspiration for the project. The “integral ecology” does not focus only on the environment or only on the human condition but instead assumes that human beings and the environment are deeply interconnected and embedded. From this perspective, it is fundamental that the local community becomes actively involved in environmental preservation projects:

My program has a solid environmental connotation, which implies people involvement rather than merely ecological protection. I refer to the Pope's Encyclical “*Laudato si'*” and, in particular, to the integral ecology concept [...] When I talk about protecting the environment, I mean that all of us are the main characters of this phase [...]. From a participative point of view, I believe that the energy community project is an extraordinary experiment. [Valle Maira's Mountain Union's president]

As for the Pinerolo case study, the main instigator for the community energy project is represented by the Consorzio Pinerolese Energia (CPE). In 2019, it helped establish an oil-free zone that encourages renewable technologies to decrease CO₂ emissions, nurture an inclusive governance model in the area and educate the population towards alternative energy uses. In particular, the local actors took advantage of the existing regulation (Law 221/2015), which permitted establishing an area that boosts natural resources and makes the community independent from fossil fuels. In other words, they created the oil-free zone as an expedient to solving the lack of the European Directive's implementation at the national level. Currently, the oil-free zone represents the core of the future energy community, comprising six municipalities, five companies and the CPE.

The renewable community's energy producers will be local companies (i.e. the multi-utility Acea Pinerolese) together with municipal and residential buildings from the six towns that constitute the oil-free zone. Specifically, Pinerolo's energy community will produce electricity from the hydroelectric power plant called Inverso Pinasca, solar panels of varying size owned by companies, public actors and private citizens, and biomass and biogas from the waste of the oil-free zone. Currently, Pinerolo's actors have already installed 135.2 MW plants' total power, of which 45% (60.4 MW) is of the hydroelectric power plant, 38% (51 MW) of solar panels, 12% (16.2 MW) of biomass and 5% (7.6 MW) of biogas.

As seen from the words of the founder of the CPE, an environmentalist and physics professor at Turin's Polytechnic, the ambition in this case is also to enhance local community connections through the community energy initiative:

There are positive outcomes, like collaboration and integration. I believe that an institution like the energy community will significantly strengthen citizens' accountability, thus contributing to the sense of community. [Promoter of Piemonte's Regional Law]

Among the actors that showed their interest in the CPE's activity, Pinerolo's bishop decided to

participate in the energy community project to rebuild a shared sense of community. According to him, a considerable gap divides individuals from institutions and undermines the community itself. People do not trust the institutions any more and are reluctant to collaborate for a communal goal. Pinerolo's bishop believes that restoring a sense of community is still possible, and he imagines that the energy community model will be helpful in that:

The community has collapsed, a sense of belonging to a community doesn't exist any more [...] There is a distance between the individual and institutions because the idea of a community to which people belong is missing. We need to rebuild [the community] in several ways. The CPE is pushing people to interact with each other. In this way, I believe that it will be possible to create a sense of belonging in Pinerolo by building something that makes us say proudly: I belong here. [Pinerolo's bishop]

The bishop sees the development of an ecological consciousness as a way to contrast self-centred behaviour that blocks citizens' connection and leads to the exploitation of resources for individual needs. Like the above discourse of integral ecology, here the ecological discourse is presented as a crucial opportunity to increase people's chance to live a dignified life, as he says in the following:

[In Pinerolo] many people distrust collaboration because they say: "Collaboration doesn't pay off! Everyone should do their own thing!" That's not true; everybody can do something! Ecology also means fighting the individual as the centre of the world that uses their surroundings as its quarry. This way of thinking [the individualism] is a cancer that kills the human being [...] relationships are essential for human nature. This is also an ecological discourse since people need to be protected, ensuring a better quality of life. [Pinerolo's bishop]

Both Pinerolo's and Valle Maira's actors rely on the energy community projects to enhance citizens' participation and attachment to the territory by setting a collective goal. For Pinerolo, the CPE seems to successfully encourage various actors such as municipalities, local companies and the Diocese toward a stronger sense of community and the population's involvement. Similarly, the Valle Maira's Mountain Union counts on its renewable energy initiative to make citizens the protagonists of environmental conservation. To reach these objectives, Pinerolo's actors intend to establish a cooperative for their energy community project. Here the promoter of Piedmont Regional Law explains Pinerolo's actors' choice as follows:

The idea was to adopt the cooperative form to involve the municipalities more quickly, thanks to the social value of this legal form. The Pinerolo's cooperative's members would be the municipalities, the local companies and the citizens. We decided to gather the towns to create a single member; thus, every member (towns, companies and citizens) would elect a representative and weigh as one within the cooperative. [Promoter of Piemonte's Regional Law]

Instead, in January 2021 Valle Maira's Mountain Union has created a temporary association of purpose (Associazione Temporanea di Scopo) in order to implement the project of energy community.

3.2.2 Development of the territory and support for the most vulnerable groups

In addition to citizens' engagement and a cohesive community, both Pinerolo and Valle Maira seem to envisage a future where their energy community will lead towards local development. For decades, the entire territory has suffered from several issues. Specifically, both areas are enduring a substantial depopulation since young people move to the cities where new opportunities are attracting them. Valle Maira's actors expressed their motivation to rely upon energy communities to encourage their development in light of the social and economic situation.

Both valleys are part of the National Strategy for Internal Areas (*Strategia Nazionale Aree Interne*, SNAI) that helps remote Italian communities develop, starting from enhancing their local resources.

The national strategy aims to improve citizens' quality of life by increasing wellness, social inclusion, extensive growth, labour demand, and territorial capital. In addition, population trends are the ultimate goal, achievable by reducing emigration and the attraction of new residents. Accordingly, the director of the Environment and Territory Department of Valle Maira's Mountain Union claimed:

We believe that this new public entity [the energy community] could bring us benefits and prevent the valley from depopulating further. Besides, it must get a new workforce for local firms. In this way, the citizens could benefit from the valley's widespread growth, which is needed today. [Director of the Environment and Territory Department]

Valle Maira presents two different areas: the upper and the lower valley. The first one relies on craft and commerce, and the second on the agricultural industry. The lower hollow is also more populated than the upper one. The Mountain Union intends to use the energy community to produce electricity for supporting the establishment of enterprises in the lower valley and agriculture in the upper valley. According to Valle Maira's actors, their project can be seen as promoting the creation of a regional development area based on a certain degree of autonomy, especially from the energy point of view. The idea is that local resources should remain within the territory and benefit the local community. For decades the valley counted on the production of hydroelectrical power. Valle Maira's actors intend to make citizens learn about the local resources that their territory offers so that everyone can join the development project. In this perspective, the energy community could enhance the existing natural resources, giving the valley a new chance of growth.

Besides preventing the valley from depopulating, the energy community represents an opportunity for sustainable development. The progress imagined by the actors involved also includes the towns' upgrade in many ways. According to the representative of Pinerolo's trade union (CGIL), the initiative could inspire the introduction of other renewable technologies, such as electric public transport powered by the energy community's solar panels.

Moreover, the areas where the Pinerolo's and Valle Maira's energy community will rise are characterised by cold temperature, which requires citizens to use their heating system during most of the year. As a result, electricity cost quickly increases and determines who can afford it and who cannot.

The energy community's promoters explicitly declared their intention to decrease citizens' bills by decentralising the electricity production fostered by their initiative. Climate change is reinforcing social inequalities and casting new population groups into poverty worldwide. Accordingly, the number of people who cannot afford a heating system is increasing in Italy too.

Pinerolo's trade union is aware of the new climate crisis's risk and believes that the forthcoming energy community would prevent its town from facing energy inequality among citizens. Consequently, reducing bill costs appears to be an additional goal for the energy community, as the local trade union representative claimed:

It can also meet the most vulnerable people's needs by reducing the costs of electricity bills. In this way, we could help people with economic issues without any additional charge since citizens would produce and share electricity within the community. [Representative of Pinerolo's CGIL]

In light of the imagined results here highlighted, the actors believe that their forthcoming energy community will be fundamental in introducing them into a new period of development, as the Mountain Union's president claimed:

This [energy community] is an extraordinary project that represents an epochal turning point. [...] It is not just about being protagonists but, above all, sharing a communal idea of development. From an innovative point of view, we will gamble it all. [Valle Maira's Mountain Union's president]

To restore the territory's social fabric, local actors are developing some parallel projects to the energy communities. In 2019, the CPE signed a labour agreement with the trade unions (CGIL, CISL and UIL) of Turin to prevent an employment crisis and safeguard work. This new collaboration between the local multi-utility Acea Pinerolese S.p.A. and the trade unions aims to develop professional profiles in the short run, creating occupation opportunities in the territory.

Moreover, recently the CPE has also organised the project "Ripartiamo Insieme" (Restart together), which aspires to address Pinerolo's development issues, further worsened by the COVID-19 pandemic situation. The local initiative's principal goal is to foster employment and develop the 47 municipalities of Pinerolo's territory. The project's strength is to gather different actors who can discuss territorial issues and find collective solutions. The participants are institutional actors, municipalities, companies, Torino's chamber of commerce, the trade unions, the CPE, Pinerolo's Diocese, the Waldensian Diaconia and Pinerolo's Consorzio Intercomunale dei Servizi Sociali (a social services' consortium of associations and institutions).

Among them, a crucial role is played by the Waldensian Diaconia in fostering the local sense of community and people's inclusion. The Diaconia is a religious non-profit entity very active in Pinerolo's territory, which aims to respond to citizens' needs, creating social services for the elderly, youth, schools, etc. The Waldensian president acknowledges the need to redevelop the area that has suffered from employment loss and underdevelopment for decades. The project "Ripartiamo insieme" promotes collective, collaborative solutions to local development problems. The energy community initiative is consistent with the spirit of the project and is thus considered as a key initiative to be included in the project.

4. Discussion and conclusion

The current paper has analysed two related community energy projects in north-west Italy, namely Valle Maira and Pinerolo in Piedmont's region. It has done so by combining insights from the MLP and the literature on sociotechnical imaginaries.

In particular, the MLP helps understand the broad multilevel context where the two energy communities have developed. As we have seen above, particularly important at the regime level was the European Directive 2018/2001, which acknowledges that European citizens can establish energy communities to produce, share and store renewable energy. Significant changes at the regime level also included the national law "Milleproroghe", which allows the Italian regions to establish energy communities. These changes at the regime level have created new windows of opportunities for niche actors interested in innovative ways to consume and produce renewable energy. Due to civil society actors' pressure, Piedmont's Regional Law on energy communities was the first to be proclaimed in Italy.

While the multilevel perspective helps frame the context from which the two projects have emerged, the sociotechnical imaginaries allowed us to analyse the motivations behind community energy technologies' development. Sociotechnical imaginaries are cultural frames that project on innovations, people's aspirations and ideas of change.

The local actors associate two main sociotechnical imaginaries to the community energy's projects, as we have seen above. First, they project an idea of integral ecology and a stronger sense of community around renewable energy technology. This is especially evident in the decision of Pinerolo's bishop to join the project and his concern about the loss of the sense of a community belonging in the area, further confirmed by the Waldensian president. Moreover, the actors see the energy community as offering crucial local development opportunities for areas characterised by depopulation problems and rising energy poverty due to low temperatures.

Some actors had a crucial role in creating broad interest in the energy community projects, such as the physics professor from the University of Turin who created the CPE, and the bishop of Pinerolo. They acted as catalysts that encouraged an innovative and sustainable community model in areas where the necessary preconditions already existed (i.e. the use of renewable resources, such as

hydroelectricity). Some scholars [38] have already stressed the role of ecopreneurs in fostering innovation in marginalised Italian areas, using energy communities to reduce population loss and underdevelopment issues.

Although the acceptance of the energy community projects seems already to be enthusiastic at the initial planning stage, the promoters still need to work on a broader divulgation of their initiative that engages the entire population. So far, the civil society's actors that have shown their interests are individuals who identify in the energy community model an opportunity for local development and citizens' empowerment. However, not all the population acknowledges the same shared imagined future from the energy community initiative.

Scholars [36] noticed that public involvement derives from various activities, such as communication, consultation and participation. For instance, Valle Maira's promoters plan to educate the citizens, starting with young people in schools. At the same time, Pinerolo's actors were involved in other projects aiming to sensitise individuals about the importance of preserving their territory.

Finally, the MLP also helps to understand that, as researchers [37] stressed the importance of a "grand narrative" in accepting decentralised energy projects, the institutional and regulatory framework represents another essential element that would boost the two renewable energy experiences. Italy will implement the European Directive 2018/2001 by June 2021, when the government will set new incentives to support energy communities' establishment across the nation. So far, the lack of a national regulation has impeded the energy community from becoming a dominant and shared model by private citizens and local administrations involved in the areas investigated.

Moreover, to conclude, it has to be stressed that although the two cases already present promising elements of democracy, it seems complicated to go any further now. Only once the Piemonte's energy communities complete their initial planning phase will it be possible to assess other factors that prove their actual democratic structure.

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