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Renewable Energy Communities: Urban Research and Land Use Planning

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**Renewable Energy Communities:
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Toward the energy transition: a possible methodological approach included in the Climate Transition Strategy

Verso la transizione energetica: un possibile approccio metodologico incluso nella Strategia di Transizione Climatica

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ABSTRACT AND KEYWORDS

Toward the energy transition
Rising urban greenhouse gas emissions are only one cause of climate change. Seventy percent of these emissions are produced by cities, which are therefore key players in efforts to slow environmental impacts. The alarm raised by this situation has prompted the adoption, nationally and internationally, of a series of regulations geared toward reducing climate-altering gases and promoting energy transition policies. How can urban planning contribute? The Municipality of Brescia has tried to answer this question by approving a Climate Transition Strategy (CTS) to achieve the challenging goals posed by adapting cities to climate change. This paper aims to illustrate the programmatic path introduced by the city administration to initiate the energy transition. Also, it shows as a methodological approach based on a systemic and multi-sectoral vision closely linked to the characteristics of the territory analysed is due.

Keywords: energy transition, energy communities, One-Stop-Shop, energy poverty

Verso la transizione energetica
L'aumento delle emissioni urbane di gas serra è solo una delle cause del cambiamento climatico. Il 70% di queste emissioni è prodotto dalle città, che sono quindi attori fondamentali negli sforzi per rallentare gli impatti ambientali. L'allarme suscitato da questa situazione ha spinto a adottare, a livello nazionale ed internazionale, una serie di normative orientate alla riduzione dei gas climalteranti e alla promozione di politiche di transizione energetica. Come può la pianificazione urbana dare un contributo? Il Comune di Brescia ha cercato di rispondere a questa domanda approvando una Strategia di Transizione Climatica (STC), che mira a raggiungere gli impegnativi obiettivi posti dall'adattamento delle città ai cambiamenti climatici. Questo lavoro ha l'obiettivo di illustrare il percorso programmatico introdotto dall'amministrazione comunale per avviare la transizione energetica. Inoltre, dimostra come sia necessario un approccio metodologico basato su una visione sistemica e multisettoriale strettamente legata alle caratteristiche del territorio analizzato.

Parole chiave: transizione energetica, comunità energetiche, One-Stop-Shop, povertà energetica

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1. Introduction

In recent years, it is clear how the phenomenon of climate change has taken on increasingly impressive dimensions. High greenhouse gas emissions from multiple human activities have accelerated these changes, which in turn impact nature and society through effects such as rising temperatures, heavy rainfall, and rising sea levels. Although climate change is a global phenomenon, its causes and impacts on nature and society occur at the local scale (Kates & Wilbanks, 2003). Cities are responsible for up to 70% of total man-made greenhouse gas emissions, even though they occupy only 3% of the earth's surface (Edenhofer et al., 2015). Although these represent a central role for climate mitigation, they are at the same time a potential for innovation and transition to decentralized energy systems (Bögel et al., 2021). So, cities take the lead in efforts to reduce emissions and slow the pace of climate change, even though only 1% of the emissions produced internally are under the direct control of the city government (Aylett, 2013). Nationally and internationally, the alarm raised by this situation has prompted the adoption of several policies aimed at reducing climate-changing gases and promoting a wide range of energy transition policies. The goal is to lead progressively to the abandonment of fossil fuels in favour of an increasing use of energy from renewable sources. Researchers and urban planners recommend low-carbon cities as the goal of sustainable urban development, which means less fossil fuel consumption and less environmental impact. Therefore, it turns out that one of the most difficult tasks is to reduce the consumption of these fuels in city life (Huang et al., 2015). The transition to more sustainable modes of production and consumption has become one of the great contemporary challenges and requires technological, political, social, and behavioural transformation on different temporal and spatial scales (Murphy, 2008). Indeed, while the energy transition is necessary in terms of environmental sustainability, it will not be fully realized without joint management of environmental, social, and economic issues using a co-evolutionary and interactive approach, given the inseparability and mutual influence of social and technological change (Barroco et al., 2020). An integrated approach to climate change assessment should consider a complete cycle that starts with socioeconomic and technological driving forces, moves through greenhouse gas emissions and concentrations, physical changes in the climate system, impacts on biological and human systems, and back to the underlying socioeconomic and technological development pathways (Watson et al., 2001).

Within cities, residential and commercial buildings are responsible for up to 40% of global energy needs (International Energy Agency, 2018), and the total building energy consumption is expected to grow. Innovative technologies are slowing the growth in consumption, but they are not enough to meet the challenging goals of the Paris COP21. Therefore, there is a need for further integration of renewables in buildings (Bilardo et al., 2020) and, where possible, their energy refurbishment. Renewable Energy Communities (RECs) offer a new opportunity to address this challenge: they are a potential solution to reduce the geographic and temporal gap between energy consumption and production and a resilient solution for future climate scenarios (Bilardo et al., 2020). Their purpose is to provide services to the local community and involve people in the processes of energy production and consumption. These solutions ensure the active participation of citizens in the energy transition to cleaner systems (Francisco & Taylor, 2019).

In addition to contributing to the reduction of greenhouse gas emissions, building energy efficiency measures, also contribute to the improvement of citizen comfort. In particular, they help alleviate energy poverty (Aranda et al., 2017). As Boemi & Papadopoulos (2019) point out, energy poverty has been identified as a major

contributor to socioeconomic inequality that can be alleviated by improving energy efficiency. In contrast, Li et al. (2021) finds that if energy poverty is not eliminated in the long run, country's well-being can decrease dramatically. Understanding energy poverty is critical to any attempt to alleviate it: knowing who the people suffering from energy poverty are and how and why they are poor is essential to designing effective programs and policies. Several examples in literature illustrate how improving energy access correlates with improving health, productivity, literacy, etc. (Kanagawa & Nakata, 2007; United Nations Development Programme & World Health Organization, 2009).

In this context, the challenge of reshaping cities is considerable and cannot be achieved by a single group or actor. The Municipality of Brescia has taken up this challenge through the project "Un Filo Naturale - Una comunità che partecipa per trasformare la sfida del cambiamento climatico in opportunità" with the Climate Transition Strategy (CTS)[1]. This paper aims to illustrate the programmatic path introduced by the administration to initiate the energy transition. Due to a still biased regulatory framework, these issues are little explored within in urban planning.

The methodological approach requires a holistic strategy: starting from the goal of mitigating atmospheric pollution, the CTS envisages the activation of a One Stop Shop to promote to citizens actions for the energy requalification of existing buildings and awareness-raising about Renewable Energy Communities and collective self-consumption groups. Territorial analyses will be carried out to identify the area most prone to energy poverty, those most suitable for the location of RECs, and other audit activities on private block of flats and public buildings, activated through expressions of interest to identify auditors and buildings.

The work clearly shows how within the case study the energy transition is not addressed through single isolated actions, but through a complex, cross-sectoral planning approach. To the best of our knowledge, there are no other cases of strategies developed according to this holistic approach.

The remaining paper is organized as follows. Based on the literature reviewed, Section 2 presents a selection of useful tools for energy transition. Moreover, Section 3 presents the strong connection between energy transition and the territory based on some examples in the literature. Section 4 analyses the case study of the city of Brescia. Section 5 compares the methodology illustrated in the case study with other national and international examples. Finally, Section 6 concludes the study and makes some reflections.

2. Some tools for energy transition

In the mosaic of energy transition policies, Renewable Energy Communities, Collective Self-Consumption Groups, and the establishment of One-Stop-Shops (OSSs) are undoubtedly important pieces. They all promote the reduction of energy consumption from fossil fuels: the first two by spreading the production and consumption of energy from renewable sources, the last one by setting up a useful service that provides technical information on the energy upgrading of buildings.

2.1 Renewable Energy Communities and Collective Self-Consumption Groups

Despite the current high level of interest in the topic, there is still no common definition for Energy Communities (Becker & Kunze, 2014). To define the term Energy Community, many articles choose a definition of EC according to the scope of their topic (Brummer, 2018).

According to (Oteman et al., 2014) EC is strongly connected to the use of renewable energy. Moreover, looking at the organizational structure, the concept of EC includes participative decision-making (Romero-Rubio & de Andrés Díaz, 2015) combined with community ownership (Haggett & Aitken, 2015).

In our work for Energy Community, we mean a group of users (private citizens, small-medium enterprises, commercial activities, local authorities) that decide to aggregate locally, equipping themselves with one or more plants powered by renewable sources to share the energy they produce and optimise their own consumption. Therefore, they are defined as Renewable Energy Communities (RECs). The aim is to generate benefits both for the participants (mutualistic purpose) and for the territory in which the Community develops (solidarity purpose). Energy communities promote a capillary diffusion of the production and consumption of renewable energy sources with a 'bottom-up' approach that involves citizens. This is a fundamental step: only by raising citizens' awareness and giving them a proactive role in the energy transition is it reasonable to think we can achieve the European ambitious decarbonisation targets set for the coming years. These configurations promote the creation of real Communities, which aim to generate social, environmental, and economic benefits not only for their members, but also for the territorial realities in which the energy communities are developed. The Renewable Energy Communities were introduced by the EU Directive 2001/2018, issued to foster the development of energy from renewable sources on the territory of the European Union, promoting, to this end, the active participation of citizens and final customers. In Italy, an initial trial period was activated with early transposition of the Directive (Art. 42-bis of Decree-Law n. 162/2019). Full transposition is by Legislative Decree n. 199/2021, which came into force on 15 December 2021.

Renewable Energy Communities take shape when several electricity end-users aggregate and equip themselves with systems to produce energy from renewable sources. On the shared energy - the energy produced by the systems of the RECs and simultaneously consumed by its members - the Community receives an incentive from the State which is shared among the participants and/or reinvested in socially useful projects. The energy produced by the RECs' systems that is not self-consumed by the system's owner or the user directly connected to it is fed into the energy network. In addition to being commercially sold, the energy fed into the network is available to the RECs for sharing among its participants and can generate additional revenues in the form of incentives and reimbursement of network charges.

Energy Communities generate numerous benefits for the people, entities and communities involved (Figure 1).

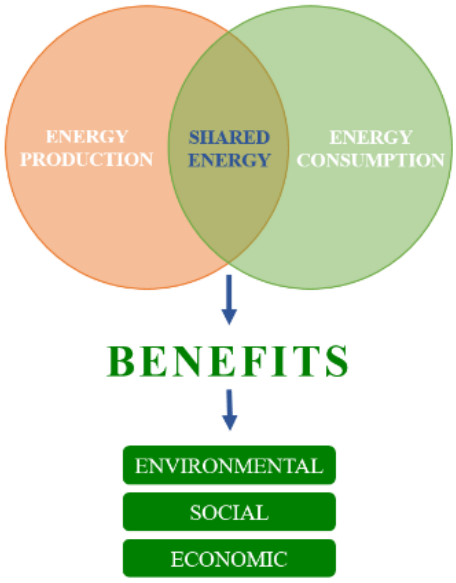
In general, the possible benefits can be classified as:

- environmental benefits: thanks to the energy produced by technologies powered by renewable sources, CO2 emissions and other climate-changing gases are reduced, and a decisive contribution is made to the energy transition (Kalkbrenner & Roosen, 2016);
- economic benefits: by participating in an energy community, it is possible to reduce the costs of one's own energy consumption, thanks to the incentive that the Community obtains on the shared energy and which it generally distributes among the participants (Walker et al., 2007);
- social benefits: greater community cohesion through the involvement of disadvantaged and/or vulnerable subjects and the increase of awareness regarding the issues (Devine-Wright, 2005).

Like the benefits, several barriers have also been identified that hamper the build-up

and resilience of REC initiatives. First, the lack of institutional and political support with regulations complicates the establishment of RECs (Nolden, 2013). In addition, initial funding problems and lack of long-term funding are also obstacles (Walker, 2008). Finally, the market structure and the legal framework very often favour large companies to the detriment of small communities (Sovacool & Lakshmi Ratan, 2012).

Figure 1. Functioning of an energy community



2.2 One-Stop-Shop

According to the Farlex Financial Dictionary, the One-Stop-Shop (OSS) is "A company that offers a wide variety of goods and/or services to a customer or client. […] One-stop shops aim to attract customers and clients by allowing them to save the time and energy they would otherwise spend going to different companies for different activities"[2].

The OSS are defined by Directive 2018/844/EU, which amends two previous EU directives on the energy performance of buildings and energy efficiency. Recently, to reach the targets defined by the climate package 'Fit for 55', the rate of retrofitting should be around 3-4% per year. According to Boza-Kiss & Bertoldi (2018), OSSs could be a solution to help landlords and tenants start the renovation process and overcome numerous technical, financial, or bureaucratic obstacles.

The idea behind the OSS is to offer a free service to citizens that interposes itself between the landlord and the free market to simplify and speed up procedures. By transforming a complex set of multiple-actor decisions into a single entry and customer-centric service, OSSs have the potential of establishing a bridge between the fragmented demand and supply sides of the traditional renovation value chain (Bertoldi et al., 2021).

OSSs are well equipped to address the edge of market fragmentation on both the demand and supply sides, as they overcome the sociotechnical barriers surrounding the retrofit decision holistically (Mahapatra et al., 2013).

There are different business models for this service that vary according to the

services offered by the counter (Figure 2).
The "Facilitator" model is the simplest: the OSS acts as an orientation figure helping the owner to know what energy efficiency is. With the "Coordinator" model, the OSS puts potential market players in contact with the companies carrying out the work. Finally, with the "Inclusive Model", the OSS acts as a single figure supporting the owner, providing support from the beginning to the end of the building's energy renovation.

Figure 2. Business Model type for an OSS

Bertoldi et al. (2021) highlighted the potential of the OSSs to remove barriers to energy retrofitting of buildings, such as upfront costs, shared incentives, and cost of financing. To promote retrofitting, Brown (2018)identifies the OSSs as a holistic approach to facilitate residential redevelopment combined with other types of renovation.
While the various services and capabilities offered by a single institution are likely to be competent, they may not be as expert as those offered by professionals specializing in different fields of energy, construction, taxation, legal etc.
Additionally, a customer's options and choices may be limited to certain people, products, and services. In addition, depending on the type of business model chosen, the OSS service has a cost[4].

3. Synergy with the territory

For the development and dissemination of RECs, municipalities play a primary role in the creation process, with an indirect or direct intervention.
In case of indirect intervention, the municipality limits itself to encouraging the creation of an energy community in its own area: it identifies the potential of the territory concerned, based on an analysis of its social and industrial morphology, and monitors the results of the actions undertaken, without intervening in the development dynamics of the initiatives. In case of direct intervention, the municipality acts as a true promoter of the energy community, taking on the task of communicating to citizens the possibility of participating in the community and helping to establish the legal entity in which it is embodied. The direct intervention of the municipality in the process of establishing and developing energy communities ensures that the benefits generated by it do not remain confined only to the members of the community, but also fall back on the territory in which it is grafted and are directed and/or reinvested considering local needs and peculiarity. The Energy Communities possess a marked local characterization since one of the

essential requirements is territorial proximity, which requires that the participants be in the same territory where the Community has located its energy production facilities.

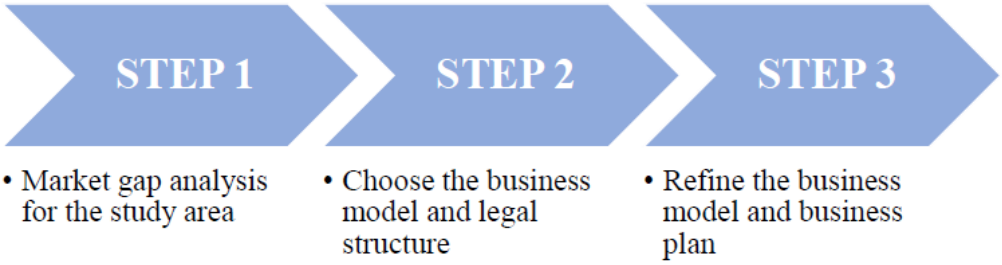
The territorial vocation of Renewable Energy Communities manifests itself in various ways. Indeed, they use renewable energy projects not only for economic benefits directly to their members, but also to support and finance social programmes, make investments in energy efficiency, create local employment, find answers for various community development needs, and combat energy poverty. All of this translates into a significant contribution to the growth and/or revitalisation of the economy of the territories covered by Energy Communities.

Therefore, Renewable Energy Communities ensure that a substantial part of the economic value generated by the energy transition remains within the territorial realities in which they are created, assuming the form of social investments. A precious opportunity for local valorisation and development, to be exploited not simply 'on the territories', but 'with the territories', in the framework of an effective work of involvement of local communities. One CE characteristic is a strong emphasis on the geographical allocation of production and consumption nearby (Allen et al., 2012).

The potential of the territory and the analysis of its morphology are also fundamental elements for the realisation of One-Stop-Shops. In choosing the business model to be implemented, the local authority must follow three important steps (Figure 3). Firstly, the market analysis is used to provide information regarding the building type, ownership type and era of construction of the buildings. Then, by assessing the maturity of the market in relation to human and financial resources, the business model appropriate to the local context is chosen. Finally, one defines the legal status of one's OSS.

Therefore, the synergy between local authorities and the territory is essential to contribute to the development of these initiatives.

Figure 3. Steps for developing an OSS' Business Model



Many authors explain the weakness of energy-related urban strategies, policies, and action plans with the lack of integration between energy and spatial planning (De Pascali & Bagaini, 2018).

Owens (1992) has underlined the need for a systemic approach to consider the relationship between energy and urban planning. Isn't it simplistic to consider energy only from the point of view of a sector, without considering the territory? Consumption of buildings but also mobility and transport, distribution of activities, and conditions of comfort.

4. The case study of Brescia

As part of the policies to combat climate change, in the summer of 2021, the Municipality of Brescia approved, within the "Un Filo Naturale" project[3], the Climate Transition Strategy (CTS) in partnership with AmbienteParco, the Euro-Mediterranean on Climate Change and the Brescia Hills Park. The project was initiated thanks to the contribution of Cariplo Foundation and Lombardy Region, has a duration of four years, and already sees the partners acting to provide continuity and sustainability beyond that period. The CTS is a long-term tool with the objective of increasing natural capital and biodiversity, counteracting rising temperatures and heat waves, and contributing to the reduction of critical hydraulic problems.

The Strategy will be implemented through 30 "pilot" actions in terms of adaptation, mitigation, participation, and community involvement, according to a medium and long-term planning that integrates and dialogues with the set of general and sectoral planning and programming tools of the Municipality.

The objectives of the actions are to make Brescia a:

- oasis cities, creating areas of shade and coolness, bringing nature into the city for the well-being of people and to improve the urban microclimate. The expected benefits are an increase in the absorption and storage capacity of climate-changing gases and a reduction in the urban heat island;
- sponge city, to return space to water and permeability to the earth to accommodate life. The expected benefits are increased urban drainage and increased natural capital and biodiversity (as well as vegetation resilience factors) and integrated management of connections between urbanised and peri-urban green areas;
- cities for people, creating more liveable spaces where the right to health, meeting and inclusion is guaranteed. The expected benefits concern making the city safe from high atmospheric phenomena and reducing the danger of air pollution.

Some of these 'pilot' actions will be implemented in the next few years (green roofs, de-paving of urban open spaces, energy efficiency of existing buildings), others will be carried out in a longer-term vision, based on plans, strategies and guidelines that are being implemented.

The CTS includes multi-sectoral approaches on multiple issues and does not present the tools for energy transition in a straightforward manner. However, through a careful analysis of adaptation and mitigation actions, several initiatives with this common objective were found that the municipal administration intends to implement. First, the establishment of an internal service within its offices to promote and facilitate energy retrofitting of existing buildings. This will be a free service, an energy desk on the European One-Stop-Shop model. In parallel, several territorial analyses are being carried out to identify the area most prone to energy poverty and those most suitable for the location of energy communities, and public-private partnership operations for the energy requalification of municipally owned public residential buildings.

4.1 The One-Stop-Shops

The One-Stop-Shops will be available to households, condominium administrators, small and medium-sized enterprises, artisans, and commercial operators with the aim of promoting programmes and projects for the decarbonisation of the public and private sectors based on energy efficiency, reduction of energy consumption and the use of renewable resources. The OSSs will make itself available to citizens by

providing information tools on the technical, economic, fiscal, and procedural aspects necessary to develop, with awareness, energy requalification works and the establishment of energy communities and collective self-consumption groups. It will be possible to receive information on the economic incentives available both at national and local level in the field of energy requalification. In detail, the OSSs provides information on existing energy-saving and renewable energy technologies, provides information on available financing instruments, disseminates good energy-saving practices, contributes to the diffusion of greater awareness on the subject, and promotes calls for tenders and expressions of interest in the field of energy rehabilitation of buildings. In addition, the counter provides for the publication of:

- an expression of interest to identify private condominiums on which a technical and economic feasibility will be developed free of charge for future energy requalification works and the establishment of energy communities and collective self-consumption groups;
- an open tender to identify energy auditors who will be entrusted with audits of public and private buildings.

Retrofitting measures characterised by an integrated approach to various climate change issues such as heat island reduction and runoff, and favouring nature-based solutions (e.g., green roofs/walls) will be encouraged. The information and awareness-raising activities of local stakeholders will be supported by competent technical figures; electricity consumers will be informed that they can associate to produce locally, through renewable sources, the electricity necessary for their needs, "sharing" it.

In the private sector, the Municipality of Brescia intends to promote the energy upgrading of existing apartment blocks, which represent one of the main building types in the municipal area and can significantly influence CO2 reduction targets. The activity involves condominium administrators who will be able to find in the OSSs a support to carry out the energy assessment of the building, the evaluation of the feasibility of potential energy requalification interventions, the activation of the financing process and the whole process.

On the other hand, for the public heritage, the municipality intends to initiate a process for the energy efficiency upgrading of approximately 60 municipal buildings, with priority given to school buildings, starting with energy assessments of the buildings, and evaluating the feasibility of public-private partnerships as an alternative to direct construction. Therefore, detailed analyses of the buildings in terms of energy efficiency and feasibility studies will be conducted.

In addition, a process of energy upgrading in public housing is to be initiated to combat energy poverty to ensure an adequate standard of living and facilitate social inclusion by providing adequate heating, cooling, and lighting of dwellings. Calls for funding will be identified for the regeneration of specific urban areas to help reduce housing and settlement discomfort, particularly in suburban areas, and improve the quality of life and parts of cities.

4.2 Building Energy Communities

For the construction of energy communities, a master plan will be drawn up for the development of Renewable Energy Sources projects for multi-site self-consumption. Preliminary studies will focus on the technical and economic feasibility of energy community generation plants. These studies are closely linked to the territory. It will start with the assessment of the contribution of existing municipal photovoltaic plants to energy communities by carrying out a census of the systems themselves and considering their actual production. It will continue with the calculation of the

building's self-consumption (starting from real energy consumption) and with the screening of municipal buildings/areas to identify suitable sites for the installation of renewable energy production plants.
For the creation of an energy community, it is necessary to identify primary and secondary substations and some reference areas. In addition, it is necessary to estimate the installable power at the most interesting sites and prepare an outline layout for some photovoltaic systems. Finally, an economic feasibility of the intervention should be estimated by means of a cost-benefit analysis and the possibility of integration with electricity storage systems should be evaluated.

4.3 Public and private partnership

The energy upgrading of some municipally owned public housing buildings will be carried out through cooperation between public and private actors, with the aim of financing, constructing, and managing infrastructures or providing services of public interest. The first phase will be concerned with outlining the condition of the buildings/complex of buildings to identify the redevelopment interventions needed to increase the efficiency of the building-plant system. It will start with an initial retrieval of the available documentation and an on-site inspection, to continue with an energy modelling of the building-plant system of the situation to evaluate the best technological solutions related to the situation under examination. Subsequently, energy modelling of the project state will be carried out to assess the achievable savings. Together with the redevelopment project, the building management project will also be drawn up.
The second phase will focus on the economic and valuation analysis of the investment for the elaboration of the Financial Economic Plan. Finally, the third and last step will involve the definition of all the necessary documentation.
The planned requalification interventions include the thermal insulation of opaque surfaces, the replacement of windows and doors, the installation/replacement of shuttering systems, the replacement of the winter air conditioning system, and interventions to reduce seismic risk. These operations return a highly significant requalification work, with the objective of increasing the quality and performance standards of the buildings in question, making the environments more welcoming and comfortable for the occupants, and generating positive impacts on the environment.

5. Discussion

The Brescia case study differs from other examples of energy transition because it introduces an interdisciplinary and multi-sectoral approach to developing it. In detail, it carries out several actions that include different subjects and modalities with one common goal. To the authors' knowledge, this peculiarity is not found in other projects. In Italy, we find the example of the City of Milan. Between 2022 and 2023, the administration approved the Area and Climate Plan[5] and activated an Energy Desk[6] for citizens and operators. Unfortunately, from the analysis of the two instruments, they do not seem to communicate with each other in the common goal of decreasing air emissions. Another example is Bologna, a city in Emilia-Romagna, that has always been a very active and attentive region to the issue of climate change. GECO[7] is the pilot project that will lead to the creation of the energy community of Pilastro - Roveri (BO). Despite efforts to disseminate and communicate good practices, this does not seem to be part of a broader strategy but just a one-off

initiative. Again, the Padova FIT Expanded[8] project aims to create and pilot a One-Stop-Shop dedicated to home energy upgrading services in Padua city and export it to some European cities. Again, unlike in the case of Brescia, the intervention does not appear to be part of broader policies in the field of energy transition.

6. Reflections and conclusions

Global warming triggers climate change that threatens to cause incalculable damage. The scientific community is unanimous in attributing the cause to anthropogenic emissions of greenhouse gases into the atmosphere. To achieve the goal of Carbon Neutrality by 2050, the main tool is the energy transition. A major contribution to decarbonisation comes from the electrification of consumption, replacing electricity from fossil fuels with electricity generated from renewable sources that improves energy efficiency. The energy transition, however, is not limited to the development of clean energies: it is a change of the whole system whose benefits fall on the environment, the economy and society. In this work we have seen a possible approach towards energy transition implemented by the Municipality of Brescia, which supports the development of renewable energy through the creation of energy communities and collective self-consumption groups, also activating actions for the energy renovation of buildings. For these operations, free services such as the One-Stop-Shop will be activated to support citizens in promoting decarbonisation programmes and projects based on energy efficiency, reduced energy consumption and the use of renewable resources. A Public-Private Partnership (PPP) is also being developed to take over the rehabilitation of some municipally owned buildings, while maintaining the management of the infrastructure, to increase the quality and performance standards of the renovated buildings.

The strategy implemented in the municipality of Brescia includes the use of well-known tools used at the European level. Therefore, this holistic approach could be used in other national and European contexts, but a synergy with the territory in which it operates remains essential. Each territory has unique characteristics that cannot be generalized. Moreover, as explained in the preceding paragraphs, the tools mentioned have several pros and cons in their use. For both RECs and OSSs, the phase that presents the most difficulties is the start-up of the initiative. At this stage, the support of the public administration is crucial.

The energy transition has become necessary to save the planet from the effects of climate change. Not only for the well-known environmental benefits (reduced pollution, improved air quality, etc.), but it represents a great opportunity in terms of economic welfare, employment growth, and social development of the involved communities. Fighting energy poverty in many parts of the planet and investing in ensuring access to clean energy for all is also a major development opportunity for local communities. The important thing is that the energy transition is inclusive and leaves no one behind: a just transition.

Notes

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Conflicts of Interest

The authors declare no conflict of interest.

Originality

The authors declare that this manuscript is original, has not been published before and is not currently being considered for publication elsewhere, in the present of any other language. The manuscript has been read and approved by all named authors and there are no other persons who satisfied the criteria for authorship but are not listed. The authors also declare to have obtained the permission to reproduce in this manuscript any text, illustrations, charts, tables, photographs, or other material from previously published sources (journals, books, websites, etc).

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