

D3.1

Case study 1 report: Renewable energy district – Bologna Pilastro-Roveri, Italy

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Executive summary

This deliverable provides a brief overview of the results collected within the case study #1 (and the case study participants) Pilastro-Roveri, in Bologna, Italy, one of the six case studies analysed in the GRETA project, targeted to provide enhanced understanding of the different conditions that affect the emergence of energy citizenship. The Pilastro-Roveri case study is focused on an ongoing process of energy community development located in Italy, and analyses different factors affecting individual citizens' preferences, and type and level of citizens' engagement to join the energy community. In particular, this deliverable aims to analyse how the different factors, including outcomes arising from the engagement, the dominant social norm to engage, and level of agency employed, affect the emergence and the level of engagement of energy citizenship in Pilastro-Roveri area. Moreover, it interrogates on the ways in which the relational model presenting the interactions among the actors, and asymmetries across the behaviour of the actors can mediate the emergence of energy citizenship. To answer these questions, the research on the case study resulted from the combination of the framework for research on energy citizenship provided in WP1, which included a definition of energy citizenship and a three-stage model to identify the emergence of energy citizenship, the secondary data provided in WP3 concerning the background analysis of the case study. The background study has been complemented by primary data collection through interviews to Pilastro-Roveri inhabitants, business owners, policymakers at different governance levels (local, regional, and national) and through the workshop organised in the context of WP5 for the definition of the Community Transition Pathway and the Community level Indicators (WP2). The goal is to offer a picture of the relevant policies and plans and the interactions among the main actorship performed through different data collection methods and to provide an overview of the results collected within the case study according to several core issues.

The document is structured as follows:

- section 1 offers a detailed description of the case study (briefly retrieving some information from the background study) and the actor and policy landscape in which it is embedded, and provides an overview of the case study design and methods;
- section 2 provides a summary of the findings of the case study-specific research;
- section 3 analyses these findings in light of the framework for the emergence of energy citizenship developed and documented in D1.1;
- section 4 provides a discussion and reflection on the main points of analysis, before section 5 summarises and concludes the findings of the case study.

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Abbreviations and acronyms

AR:	Authority Ranking
CLI:	Community Level Indicators
CS:	Community Sharing
CSR:	Corporate Social Responsibility
CTP:	Community Transition Pathway
EM:	Equality Matching
GECO:	Green Energy Community (Project)
kWh:	kilowatt-hour
kWp:	kilowatt-peak
MP:	Market Pricing
PV:	Photovoltaic
REC:	Renewable Energy Community
WP:	Work Package

1 The Case Study: Introduction

The Italian case study is the Pilastro-Roveri district located in the north-east part of Bologna Municipality where a financed Green Energy Community project (GECO) has been running since 2019 to support communities in the process of designing and creating a renewable energy community. The district is characterized by substantial differences between the communities of the two areas. Pilastro community is composed of residential population that has been historically active in social activities, while Roveri community is composed of transient inhabitants, city users who stay in the area only for limited hours per day.

1.1 Case study description

The case study of the Pilastro-Roveri area, located in the north-east part of Bologna, is a large but physically well-defined multi-functional area, with a strong presence of associations, active citizens, organisations and civic committees. Moreover, it is home to the largest roof-mounted solar photovoltaic plant in the EU and has a district heating plant (waste-to-energy plant). Bologna Pilastro-Roveri is a socio-economically complex neighbourhood area, featuring a mostly unaware community maturity in relation to energy topics. The Green Energy Community (GECO) project running from 2019 to 2022, is dealing with the process of establishing an energy community in this district. GECO has started some engagement activities and meetings, but the participation has not been extensive. Due to the high presence of the elderly and foreign population (Pilastro), interaction concerning technical topics is difficult because of reduced access to social media and digitization. In addition, competitiveness and privatism tendencies prevent the participation of specific categories (e.g., entrepreneurs, companies' staff), and lack of institutional trust (due to feeling of being left out from welfare and care policies) in property owners generate conflicts in the management of buildings and their maintenance, due to diversified properties (Public owned, cooperatives, PPP).

Due to its socio-economic nature, the Pilastro-Roveri case provides grounds for analyzing those conditions that increase injustice and exclusion in energy related services. This case study also represents a test bench for elaborating strategies to cope with marginalities and vulnerability e.g., by means of better understanding, utilizing and sharing of energy data. In addition, through the establishment of engagement mechanisms via the GECO community, collaboration/cooperation mechanisms among companies, partnerships and agreements among owners and tenants, and further governance mechanisms, GRETA expects to elevate the community to an active engagement level, where aware, involved citizens take decisive action towards energy goals.

The area has been involved in a series of participatory activities aimed at defining Community Transition Pathways, collaborative pathways to understand how communities can transition from different states of initial engagement with energy to more active levels. In the case study, the project aims to identify and describe the community's attitude towards energy issues through a series of incremental activities, such as collective neighbourhood treks, participation in monthly roundtables with local associations, participation in neighbourhood events, mini-interviews with local community members and co-design workshops dedicated to energy issues.

1.2 Relevant actor and policy landscape

Relevant actor and policy landscape in the Pilastro district is dense in socio-cultural associations, third sector actors as well as social entrepreneurs; Roveri on the other hand, is industrial and artisanal district rich in enterprises and production centres. Here, players and actors are related to the industrial panorama.

Public actors

San Donato – San Vitale Neighbourhood: it is the neighborhood in the north-eastern part of the city, where Pilastro and Roveri are located. the Municipality of Bologna is divided into six neighborhoods that have an important administrative role.

Municipality of Bologna: Its main activities within the Pilastro-Roveri district are connected with Progetto Pilastro 2016 which include urban upgrading interventions; social and community services. The municipality of Bologna has recently won the application for the EU mission 100 Climate-Neutral and Smart Cities by 2030, therefore the city has the ambition to foster and accelerate decarbonization and climate neutrality.

Emilia Romagna Region: It is an Italian administrative region, and the city of Bologna is the main town. The Emilia Romagna region has recently adopted a regional law for the promotion of Renewable Energy Communities.

Azienda Casa Emilia-Romagna (ACER). Social Housing Association. It is the agency that manages the public housing in Emilia Romagna Region and in Bologna. It deals with a lot of apartments in the district.

ANCI EMILIA ROMAGNA. It is the association representing the municipalities of the Emilia Romagna Region. it plays an active role in the promotion of policies to support energy communities.

Public-private actors

CAAB: Agri-food center. Its main activities regard the wholesale of agricultural products and logistic services. It also owns the EU's largest PV plant on industrial roofs.

AESS (Agency for Energy and Sustainable Development): AESS is the project coordinator of GECO. The mission of AESS is to provide services to companies, economic and social operators, public and private law bodies and other associations. Specifically, AESS deals with: efficiency in the use of energy resources; improving the use of renewable energy sources; the reduction of greenhouse gas emissions; the promotion of sustainable mobility; raising public awareness of sustainable development. Their role in the GECO project was to develop feasibility studies for photovoltaic plants and preparatory studies for the creation of the legal entity of the renewable energy community (REC).

Associations

Legambiente Arboreto: district headquarters of national environmental association Legambiente. It organizes environmental related activities and meeting at Pilastro.

Legambiente Emilia Romagna: regional headquarters of one of the most spread Italian environmental environmental association. It runs an energy help desk to inform and support citizens interested in energy transition issues.

Circolo la Fattoria: The association was founded with the aim of providing solutions to the need for aggregation and social cohesion in the Pilastro area, overcoming the stereotypes that see it exclusively as a degraded suburb. The association has developed activities that are part of the social and cultural life of the whole of Bologna and has become one of the most important places in terms of courses and workshops. Among these, in the spaces of the urban farm, it hosts courses and events dedicated to environmental education for children and adults.

Others

Citizens: All the citizens live in the Pilastro area. Almost all of the residents dwell in a public house managed by ACER, a large part in a cooperative-managed building, others are owners or renters. A group of owners has founded the Promoting committee for a REC in Pilastro with the aim of paving the way to the establishment of the first REC in Bologna.

Firms: They are based in the Roveri industrial area. Roveri represents one of the areas in the city of Bologna with the highest concentration of small and medium-sized enterprises. The type of companies currently established in the area reflects the more general situation of artisan companies in the province of Bologna, with a strong prevalence of mechanical processing (the precision mechanics sector is very important among these), while the presence of other production sectors (wood,

clothing, plastics processing, construction, etc.) is more modest. Given the availability of warehouses - the average size of warehouses is 577 square metres with a strong prevalence of small warehouses (about 60% of them are smaller than 600 square metres) - and roofs, several companies are interested in setting up and being part of a REC.

GECO: Project funded by EIT Climate-KIC. It aims to establish a renewable energy community in the neighborhood. The establishment of engagement mechanisms via GECO energy community is expected to elevate the community of the case study to an active engagement level. GECO's objectives are: to produce, consume and exchange energy with a view to self-consumption and collaboration; to contribute to increasing sustainability; to reduce energy poverty; to generate a low-carbon economy cycle. GECO aims to: create an entity capable of exploiting the new energy market opportunities provided by European legislation; increase the production, storage and self-consumption of electricity, install smart equipment to better manage energy supply and demand; stimulate the participation of citizens and local actors with activities related to the dissemination and promotion of behavioural changes; stimulate the development of the national and regional regulatory framework for energy communities. GECO and GRETA will benefit from each other's activities.

Fondazione per l'Innovazione Urbana – FIU: Established in 2018, it aims to study, communicate, elaborate and co-produce knowledge about urban transformations in order to face social, environmental and technological challenges.

Casa Gialla – Public Library: it is especially thought for youth projects. The building has been completely renovated and it respects sustainable building standards. Several actors have been involved in the project and it will be managed by the municipalities' working staff.

Policy Landscape

Despite suggesting the implementation of actions at the European level, the Clean Energy Package leaves the responsibility of defining operating instruments and paths to the national governments. The current Italian legislation introduced Energy Communities in the law-decree 30 December 2019 n. 162, named Milleproroghe, where article 42bis sets forth the possibility to create collective energy self-consumption with a precise definition of conditions (i.e., total power under 200 kW, involvement of only low and medium tension). Recently, the Law Decree 199/2021 opens up the possibility of incentivising plants up to 1 MW and participating in Energy Communities if they are connected within the boundaries of the same main substation. However, the final conversion of the directive through the implementing decrees by the competent ministries of Law 199/2021 is still missing. As a result, the concrete implementation of energy communities is stalled and hampered by a regulatory vacuum. However, the Ministry for the Environment and Energy Security has recently published a call for a public consultation to ask citizens, firms and local

authorities about how to define the final version of the implementing decrees regarding energy communities.

Main environmental and energy policies at regional and local level which also provide the condition for the establishment of renewable energy communities are listed below.

Regional policies

- **Regional Energetic Plan (2017):** The plan adopts the European objectives for 2020, 2030 and 2050 on climate and energy as a driver for the development of the regional economy, and in particular: the reduction of climate-changing emissions; the increase in the share of consumption coverage through the use of renewable sources; the increase in energy efficiency in private, public buildings, transport and production activities. In particular, it incentivises: Reducing climate-altering emissions by 20% by 2020 and 40% by 2030 compared to 1990 levels; Increasing the share of consumption coverage through the use of renewable sources to 20% by 2020 and 27% by 2030; Increasing energy efficiency to 20% by 2020 and 27% by 2030.
- **Patto per il lavoro e il clima della Regione Emilia Romagna (2020):** The Pact for Work and Climate is part of an Italian and European Union strategy whose objective is to achieve climate neutrality by 2050 and transition towards a new, more environmentally and socially sustainable economy. The pact identifies strategic objectives: to generate quality jobs, to fight inequalities, to promote the ecological transition towards the goals of the 2030 agenda for sustainable development. The pact includes main targets: to achieve decarbonisation by 2050; to move to 100 per cent renewable energy by 2035; to devote 3 per cent of regional GDP to research; to decrease the number of Neet (young people not studying and working) below 10 per cent.
- **REGIONAL LAW 27 May 2022, No. 5: Promotion and Support of Renewable Energy Communities and Self-consumption acting collectively.** The law identifies system actions and measures to support and promote collective self-consumption and energy communities, providing for the provision of contributions and financial instruments to accompany communities from the establishment and design to the purchase and installation of production and storage facilities. The law also finances: communication, information and citizen participation initiatives on the themes of renewable energy, self-consumption and energy sharing, also in collaboration with energy agencies; training for the professionals involved; support for the creation of information desks and the strengthening of territorial energy desks. With this law, the Region intends to support all types of energy communities consistent with the standard but, in order to combat energy poverty and foster social inclusion, it plans to grant higher contributions for the establishment of renewable energy communities composed

of persons with economic fragility, or third sector entities, entities owning public or social housing management, or located in mountain and inland areas of the region or, alternatively, that implement inclusion and solidarity projects in cooperation with third sector entities or local authorities.

Local policies

- PUMS (2019) Bologna Città Metropolitana: first Italian experience of Urban Mobility Plan drawn up on a metropolitan scale. The objective of the plan is to achieve an important reduction in private transport in favor of non-polluting modes (bike or foot) ensuring an improvement in the existing public transport offer and their integration with more extensive and safer networks, dedicated to cycling and pedestrian mobility.
- PUG (2021) of Bologna Municipality: It identifies three macro-areas on which to act: Resilience and Environment; Habitability and Inclusion; Attractiveness and Work. These three macro-strategies highlight how environmental aspects are confirmed as a strategic priority on which to work with commitment and constancy in the coming years.
- SECAP (2021) of Bologna Municipality: It is part of the city's commitments on climate change and energy efficiency issues. It brings with it the participatory process undertaken starting from 2012 as part of the Life+ project 'BLUE AP - Bologna Local Urban Environment Adaptation Plan for a resilient city. The process aimed at the construction of an innovative climate policy increasing citizens' awareness on the risks associated to climate change and gas emissions and it was based on a participatory path in which the involved subjects were also the implementers of the actions proposed in the Adaptation Plan. The document also presents renewable energy communities as useful instruments to reduce carbon emissions and accelerate the energy transition.

1.3 Case study research design

This section describes the different qualitative research techniques used for the case study analysis, including a literature and report review carried-out for the background study and a stakeholder workshop with the members of Pilastro-Roveri community.

Moreover, the research team organised a research session lasting several months with local stakeholders, mapped, contacted and interrogated with semi-structured interviews. Furthermore, the team also resorted to participant observation during community events:

- Active Participation in the 'table of associations', a monthly meeting where many associations, cultural centres and third sector organisations come together to co-design activities in the Pilastro area.
- Participant observation during several meetings organised by other projects working on the area (i.e. the GECO project) to introduce and accompany inhabitants and users in the energy consumption monitoring, to further engage the promoter committee of a local energy community and to implement new steps towards the realisation of a REC in the Pilastro-Roveri district.

Background study

The background study was carried-out as a first step of the case study data collection. The purpose was to gather relevant information and define the scope and relevant actors of the case study. This background research and outline has several aims:

- To scope cases and identify in more detail the stakeholders involved
- To understand the background of the case and preliminary insights concerning the drivers and barriers, further analysed with the empirical results of WP3.
- To define the policy landscape of the case study to frame a context for the policy relevant insights resulting from the case study.

For the Pilastro-Roveri case study, a literature and report review of the existing information including online material (e.g., Bologna Municipality website, newspaper, and magazine articles), as well as relevant policy documents, and previous studies was carried out. The background study was complemented by a research-by-design approach thanks to the Advanced Design students' participation in a dedicated Design Studio on the area Pilastro-Roveri, working on energy citizenship. The background study report utilised a predefined structure for all the case studies to ensure a harmonised collection of background information across case studies. The report was concluded in December 2021.

Stakeholders' interviews

The interview session was divided into a first part conducted between February and March 2022 and a second part conducted between May and July 2022 aimed at investigating the dynamics of implementation on a local and regional scale (ER Region, Bologna, Rione Pilastro, Distretto Roveri) of national energy policies, taking into consideration the bottom-up participation dimension as a fundamental factor driving decisions and actions related to the transformation of energy systems.

The two interview sessions were conducted by means of semi-structured interviews, with more structured questions in the second session (with the structure provided by D1.3). They took place mainly online (because of the physical limitation due to COVID-19 measurements), with the exception of a few meetings with residents from Pilastro which were held in person.

The case study participants included 16 interviewees, which consisted of 3 citizens, all resident of Pilastro; 4 policymakers including a national, regional, and local public administration; 3 members of different associations (environmental and non-environmental); 2 business representatives, both working in the Roveri area; 4 intermediaries/facilitators supporting the establishment a REC. Most of the interviewees were women. All the residents are middle-aged or elderly people, in general having a higher level of education in comparison with the average citizens of Pilastro and a low-medium income. All the policymakers are younger than the Italian average of political representatives. The rest of the sample is represented by people between 35 and 50 years old with a high level of education. A detailed scheme of the interviewees is available in Annex 1.

The interviews were recorded after requesting a written consent form. The main results of the interviews concerned the following aspects:

- How territorial policies could trigger the energy transition;
- Energy efficiency of the building heritage;
- Participation (drivers and barriers) in the energy transition;
- Aims and benefits of renewable energy communities and related legislation;
- Trust and credibility (especially in public institutions);
- How the social and environmental dimensions of the energy transition are interrelated;
- Energy and environmental awareness;
- New skills to be acquired for the energy transition;
- Financial and knowledge barriers on the energy transition;
- The scope of GRETA and GECO projects and their impact on the neighbourhood;
- Cultural dimension of the energy transition;

- Relations with other local stakeholders.

Stakeholder workshops

The workshops were realised through a structured course called "Greta Lab. Let's discuss energy", a pathway to approach and collaborate on the topic of energy citizenship divided into five appointments in May 2022, shown in the figure below.

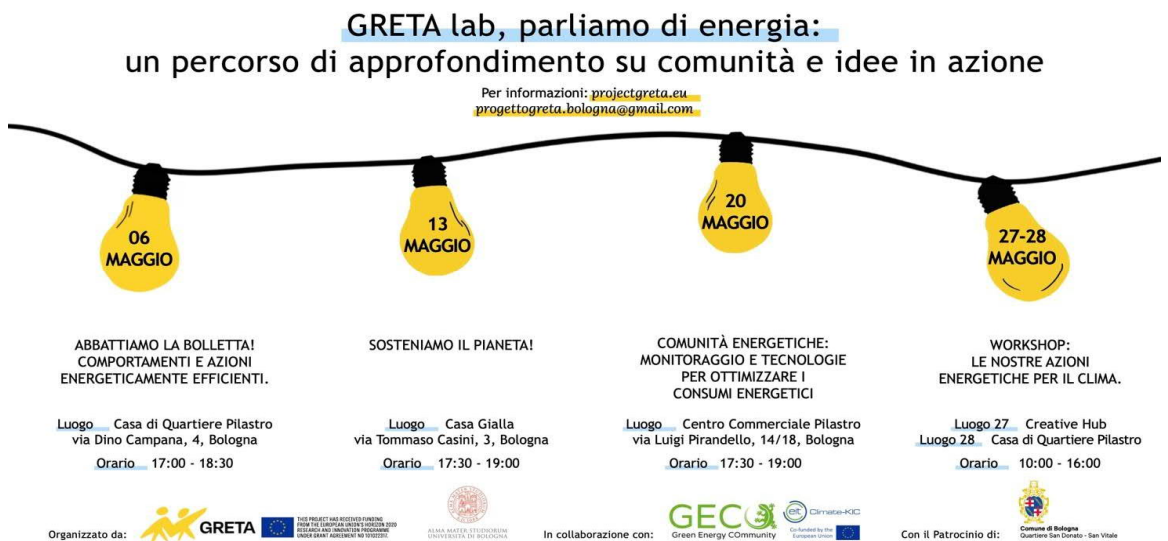


Figure 1 Stakeholder workshops in the Pilastro-Roveri area

The pathway was structured in two parts: the first appointments (May 6-13-20th) aimed to share the needs and experiences of the community on the topic of energy, environment and climate and to reflect together on what possible actions can be put in place to achieve the decarbonisation of our neighbourhoods and cities.

The final two days of the workshop pathways (May 27-28th 2022) had a double objective: to jointly define needs, future goals and actions of the Pilastro-Roveri community in the context of the Community Transition Pathway (CTP) (WP5) and to outline the Community Level Indicators (CLIs) (WP2) to monitor the progress towards the established goals.

The first day was held at the Creative Hub, in Roveri area with an introduction to the GRETA project, followed by the presentation of the methodology for the development of the Energy Citizenship Manifesto: a tool that will facilitate and accompany the exercise of energy citizenship and that GRETA will build together with the Pilastro district and the Roveri district.

Afterwards, the first collaborative workshop on needs analysis took place, a co-creation activity among the participants divided into 3 tables in which about 10-15 people participated:

- Home/office
- Condominium/company
- Region/district

The working tables were attended by residents, male and female students, researchers, workers and consultants. The second workshop of the day focused on the construction of short-, medium- and long-term visions for energy citizenship, starting with a needs analysis and the identification of objectives to be achieved. It was a co-creation activity between the participants, starting from the objectives presented and the working themes of the students of the Master's Degree Course in Advanced Service Design. The first day ended with the Advanced Design students' presentation of their service proposals for the Pilastro and Roveri area, in the presence of Councillor Anna Lisa Boni of the Municipality of Bologna.

The second day took place at the Casa di Quartiere Pilastro. The opening of the day saw the return of the results of the previous day, with a summary of the objectives arising from the needs analysis. The workshop then continued with a division into working tables (this time not divided by scale) in which we worked first on the inspirations for possible innovative actions to respond to the highlighted needs and objectives and then on the measurement of these actions with community indicators. On the basis of the identified and shared objectives and imagined actions, the working tables tried to answer the questions: What to measure? With which indicators? The tables then tried to answer the questions: How do we measure it? Who has this data? Are investments needed? By choosing some of the proposed indicators, the tables reflected on the possibilities and criticalities of collecting data to track improvements with respect to energy in the area. The report of the results of the two-day workshop was shared with all workshop participants and supplemented in its contents with ideas and suggestions.

Social Innovation Lab

Further qualitative research activities included co-design activities with policy makers at European level, engaged through the EURO CITIES network within the Social Innovation Lab. The event included two phases of knowledge and questioning of the Pilastro-Roveri area: the first was exploratory, in which researchers and policy makers collectively mapped civic initiatives and the potential for collaboration on energy in the area. The second involved a feedback-gathering activity with policy makers, who were asked about the takeaways, favourable conditions, challenges and scaling-up and replication potential of the area.

The results were as follows:

Takeaways:

- Role of intermediaries as main gatekeepers between Pilastro-Roveri ecosystem and the institutional and community levels.
- Community level emerged as key field of implementation for behavioural change, due to the density of ties and relationship they are able to develop.
- Several levels of engagement (including Regional and national collaborations) are able to elicit several layers of change (policy, market, lifestyles).

Favorable conditions:

- Active communities in both districts (Pilastro and Roveri) are a rich baseline to strengthen the bi-directional dialogue (between residents and users and with institutions)
- The characteristic of a multifunctional area is largely able to selectively engage a multi-level stakeholder ecosystem.
- Social housing widespread presence (in particular in the Pilastro area) is a fertile ground on which to base a thorough reflection on the potential for both commitment of fragile populations and of renovation of publicly owned buildings.

Challenges:

- Communication towards different cultural backgrounds and population sectors is still the largest fragility.
- The complexity of the subject increases the lack of trust of the communities.
- The organizational structure of the neighbourhood (also, the physical one) and the property arrangements are creating constraints in the decision making.

Scaling-up and replication:

- Thanks to GRETA and GECCO, new instruments are becoming available to business actors, citizens and institutions to enhance collaborations around energy or simply to kick start a conversation on it.

- The laboratory approach proved helpful in raising some criticalities otherwise difficult to express or address.
- Multi-scale stakeholder structures (such as the Metropolitan city, the Region) are expected to take the lead of the developed projects and process of engagement around energy transition in the area.

2 Research results

This section outlines the research results gained from the qualitative research methods described in chapter 1 of this report. Results from the CTPs and CLI-Workshops (D2.3) are not included in this section but will be used for the development of the WP5 Community Transition Pathway (D5.3).

2.1 Qualitative interviews

During the first interviews session, some additional questions were asked with respect to the template provided in the D1.3 guidelines. The list of questions is available in the Annex 3. The results of the interviews are categorized according to the following topics:

- **Energy policies:** the political terrain related to energy transition policies is extremely dynamic, rich in proposals, often innovative but still far from achieving decarbonisation goals. Barriers for the development of more encouraging policies are: lack of resources and expertise, the slowdown created by the pandemic, conflict of interests, and lack of awareness on various levels; institutions delaying implementation of laws, lack of internal and external governance efficiency.
- **Participation:** The participation of new and different actors in the energy sector is identified on several levels as a key element to achieve the energy transition goals. More and more actors, also due to rising energy prices and high energy bills, are approaching the energy world to try to find different solutions to conventional systems. We see, for example, the activation of ordinary citizens, associations, businesses and companies with the aim of becoming energy autonomous and/or establishing renewable energy communities. The interviews, however, paint a picture that depicts these new actors as mainly motivated by economic motivations and only secondarily by reasons related to environmental awareness and consciousness. Moreover, there are many obstacles to participation from the bottom up, an aspect that risks producing exclusionary and unfair processes. Among these, bureaucratic-administrative barriers are frequently mentioned, especially in relation to the establishment of RECs. The key role of “cultural change” is recognised by several stakeholders.
- **Renewable energy communities:** The interviews aimed to understand local institutions’ opinions and citizen perceptions regarding the necessity and feasibility of a renewable energy community in the Pilastro-Roveri area. This led to the emergence of views on the advantages of a REC in the area and the obstacles still present to its realisation. The questions also aimed to explore the innovation potential of RECs in the energy transition process from an environmental, social and economic point of view.

- Cultural dimension of the energy transition: To activate new and different actors in participation in the energy transition through energy citizenship actions, it is important to understand the levels of energy literacy or energy culture of civil society as well as of institutions or private actors. Therefore, it is crucial to intervene by enhancing energy knowledge through better education and information. Several interviews frequently highlighted the problem of a low energy culture in Italy and the need to fill this huge gap to encourage broader participation in energy-related decisions and actions. Several obstacles remain to the activation of citizens and local actors that are not engaged in environmental and social movements; this calls into question the problems related to energy justice, especially with reference to the procedural and recognition dimensions. Therefore, reflection on new ways of encouraging involvement and participation of those that are still disinterested or unable to have their say on the energy issue must necessarily be nurtured. To change one's energy behaviour, one must first understand why it is important to do pursue this objective.

3 Analysis

This section presents the findings of the interviews that were targeted to understand the factors affecting the emergence of and level of engagement to energy citizenship. The first sub-chapter defines the behaviours and goals for each actor. The following sub-chapters presents the findings of the interviews. The analysis is integrated into the energy citizenship engagement model introduced in D1.1. *Guidelines and protocols for the implementation of GRETA case studies and validation of the framework*, which identifies goals, outcomes, norms and agency as factors shapes energy behaviour of different actor groups.

The analysis presented in this section is based on the results of a total of 16 qualitative interviews conducted with citizens, associations, facilitators, policymakers, businesses, an anonymized list of interviewees can be found in Annex 1 of this deliverable.

3.1 Behaviour and goals per actor

Based on the information and model provided in D1.3 *Guidelines and protocols for the implementation of GRETA case studies and validation of the framework*, the societal goal, as well as the behaviour and goals per actor have been identified in this section.

The Pilastro-Roveri case study focuses on the development of a district-level energy community. In this framework, the overarching societal goal identified before defining the specific behaviours and goals of the actors involved, is the willingness of the actors to join activities oriented towards the formalisation of the energy community.

This was synthesized as:

Assuming as future scenario the formalization of an energy community within 2-3 years from the present, the following societal goal has been established: engage people in the (local) energy transition and achieve environmental, social and economic benefits.

Behaviours and goals per actor were identified based on the criteria provided in the theoretical framework set up in D1.3¹ for assessing the conditions upon which the emergence of energy citizenship might arise in specific settings and for specific actors.

1. The action to perform interest (the behaviour). This is related to the problem of distinguishing between behaviours and events that may be the outcomes of those behaviours. To secure this differentiation the behaviour is divided into single actions and behavioural categories. Single actions are specific behaviours performed by an individual (e.g., eating, reading, writing, running, buying, investing, installing, etc.), while behavioural categories are composed of a set of single actions (e.g., dieting, raising funds, stealing, recreational activity, developing or supplying clean technologies, etc.). Outcomes are the result of single or behavioural categories (e.g., slimming, success in exams, recycling garbage, protecting the environment, reduction of CO₂, etc.).
2. The target of the behaviour (object, subject, etc). The second criterion is the target (i.e., object, subject, institution, etc.) towards which the behaviour is directed.
3. The time when the action took, should or would take place (past, how long ago? current (this week, month, etc.), and future (in six months, one year, two years, etc)).
4. The situational context in which the behaviour occurs or is supposed to occur (e.g., in the household, in a governmental agency, in a company, in the city, etc.).

In the Pilastro-Roveri case study we identified 5 types of actors: citizens, members of associations, policy maker (at regional, local and neighbourhood level), businesses and facilitators. For each typology we have defined a behaviour to reach the societal goal and the following individual goal as below:

¹ Montalvo, C.(2022). Guidelines and protocols for GRETA case study implementation D1.3 of the Horizon 2020 project GRETA, EC grant agreement no 101022317, The Hague, The Netherlands.

Table 1 Behaviours and goals per actor

Actors	Citizens	Policymaker	Association	Business	Facilitators
Behaviour to reach the societal goal	to acquire knowledge regarding energy systems and energy consumption to become part of an energy community in the next few years (2-3 years) in the area of Pilastro-Roveri.	to provide knowledge, develop skills and policy supportive mechanisms, adopt plans and operative strategies to enhance a real local energy transition through, for example, an energy community in the Pilastro-Roveri area in the next few years.	to engage in the energy community and advocate for local environmentally sustainable actions to enhance the energy transition in the area of Pilastro in the next few years.	to engage in the energy community by buying solar panels and installing them (when possible) on their buildings in the area of Roveri and provide clean energy for their own use and for the area of Pilastro - Roveri in the next few years.	to provide facilitations, coordination and mediation among different stakeholders to enable citizens engagement in the energy transition in the area of Pilastro - Roveri in the next few years.
Likely individual goal	to reach individual economic benefits (reducing energy bills) and collective ecological ones (reducing CO2 emissions).	to secure the political agenda and facilitate re-election; to improve the city branding; to improve the city standards and behaviors on climate-related issues; to enhance the local energy transition and ensure higher quality living standards for citizens; to achieve EU energy goals	to increase knowledge on energy issues; to reduce energy bills and carbon footprint to actively participate in the energy transition; to increase community cohesion and participation as well as community knowledge on energy and climate change	to reduce company's energy bills, improving business' green reputation (CSR) investing in social-related projects (tax incentives)	to consolidate their role as city agents and intermediary acquiring the energy expertise; to actively contribute to achieve climate neutrality in Bologna

3.2 Positive and negative outcomes associated with engaging in GRETA

The aim of this section is to describe what and to what extent the different actors expect positive or negative outcomes from the engagement in GRETA in relation to themselves, society, environment and climate change for the Pilastro-Roveri case study. This favourable or unfavourable evaluation of them may arise from many factors that we will cluster in social, environmental and economic outcomes.

A number of the questions asked during the interviews were aimed at understanding the possible outcomes of the behaviour identified for each actor. Specifically, two

questions were asked to each actor regarding the possible advantages (OU1) and disadvantages (OU2) of being involved in the establishment of an energy community in the Roveri – Pilastro area.

The results are summarized in the following table, while extended questions can be found in Annex 2.

Table 2 Outcomes associated for engaging in GRETA for Pilastro-Roveri case study

Question OU	Outcomes associated with engaging in GRETA				
ACTORS	Citizens	Associations	Policymakers	Business	Facilitators
OU1	<p>Good publicity for the neighborhood</p> <p>Social and economic advantages for the neighborhood</p>	<p>Environmental benefits</p> <p>Economic benefits</p> <p>Energy Independency and energy security</p>	<p>Environmental benefits on different levels</p> <p>Reduction of energy bills</p> <p>Fight energy poverty</p> <p>Energy security and independence</p> <p>Reduce geopolitical tensions</p> <p>Building a sense of collectivity</p> <p>Empowerment of civil society</p> <p>Better energy consumption</p> <p>Change development and economic models</p>	<p>Energy security and independence</p> <p>Environmental benefits</p> <p>Economic benefits</p> <p>Networking with neighbours</p> <p>Sustainable consumption</p> <p>Environmental awareness and consciousness</p> <p>Territorial benefits</p> <p>Building a sense of collectivity</p>	<p>New interest in citizens and novel energy cooperation.</p> <p>Innovative work</p> <p>Environmental benefits</p> <p>Awareness of socio-ecological relationships - Reduce the cost of energy bills</p>
OU2	<p>Uncertainties on how and who would provide funding</p>	/	/	<p>Uncertainties about funding and normative frameworks.</p>	/

It is possible to observe that the main positive outcomes concern both tangible and intangible aspects, including a possible improvement of the image of the district, an increase in people awareness of environmental and energy issues and new opportunities for cooperation among different actors.

Regarding the disadvantages, only citizens and business have made considerations regarding the context of regulatory uncertainty on energy communities in which they are constrained to act. In fact, we have noticed that despite some positive initial pushes, insecurity regarding the certainty of the energy community's implementation process has, over time, hindered the engagement of businesses and citizens.

3.3 Norms associated with engaging in GRETA

The aim of this section is to describe how the different actors perceive their important referents. In general, it can be said that all actors are guided by, and within the limits of, the dominant social norms and values. The assessment of the social norm intends to gauge the extent to which any form of social or personal norm regarding the engagement in GRETA is present (and how strong it is) in the contexts where citizens live. Here it is hypothesized that those actors with a high perceived social pressure will be more inclined/prone to engage in GRETA.

The purpose of the section of questions concerning norms associated with engaging in GRETA has been that of collecting information and opinions about people, organisations, institutions, competitors, consumers, regulations, European directives, shareholders or national initiatives encouraging the different actors previously identified, to engage in the establishment of an energy community in the Pilastro-Roveri district. In particular, the interviews asked each actor whether there were people, organisations or institutions that are in favour or against the behaviour interest.

The main results are summarised in the table below, while extended questions can be found in Annex 2.

Table 3 Norms associated with engaging in GRETA for Pilastro-Roveri case study

Questions SN	Norms associated with engaging in GRETA				
ACTORS	Citizens	Associations	Policymakers	Business	Facilitators
SN1	GRETA researchers Local promoting committee of the REC Local associations/ small business	Municipality of Bologna University of Bologna	Citizens Third sector Schools Energy agencies Youth European cities network Platform net zero cities	Regional application for funding renewable projects Qualified figures in the field of renewable energy Regional and municipal supporting institutions Youth	Members of the association The metropolitan city of Bologna The Municipality of Bologna E-R Region private actors public / private associations Schools

Questions SN	Norms associated with engaging in GRETA				
			Business UNIBO Local associations National government and legislation		Business GRETA researchers
SN2	Communication and information Greenwashing Unclear normative framework Technological constraints Consumerist culture Local institutions	Language / communication Lack of bottom-up participation	Big national energy players Unclear legislation Authority on cultural asset and heritage Unjust incentives mechanism Ministries (essential but hard to engage) Lack of energy literacy	Market logics and interests Bureaucracy Local institutions	The individual interest of the private sector

The analysis shows that, although various actors at local and regional level are recognised as important in facilitating the realisation of the REC in the Pilastro – Roveri district, there are a number of clear obstacles. These include the broader socio-cultural context that legitimises consumerism and greenwashing, but also the pervasiveness of private and market interests.

3.4 Agency associated with engaging in GRETA

This section describes the type of institutional (public policy) support and, resources, skills, knowledge, networks, etc., available to (or mastered by) by citizens to engage in GRETA in Pilastro-Roveri case study.

Few questions were selected from the list provided in the Annex 1 of D1.3 *Guidelines and protocols for GRETA case study implementation and framework validation* to collect information and opinion concerning the different type of resources (both tangible and intangible), time, skills, that are required for each actor to achieve the behaviour of interest.

The resources and capabilities part of the interview was certainly the most fruitful part. considering that the implementation phase of the energy community is in an early stage, the actors were able to identify different types of resources, experiences, opportunities which are important for moving the project forward.

Key resources are summarized in the Table 4, while extended questions can be found in Annex 2.

Table 4 Agency associated with engaging in GRETA for Pilastro-Roveri case study

Question AG	AG associated with engaging in GRETA				
Actors	Citizens	Associations	Policymakers	Business	Facilitators
AG1	Time Alternative channels to communicate news: local blogs, local events... Financial resources Education/training /information Sharing positive experiences	Time and economic resources Networking Training /Information and new knowledge Qualified institutions and figures Public calls to build RECs Sharing positive experiences	Funding, financial resources and investments Human resources (experts on energy, on legislation and normative frameworks, on energy governance) New knowledge Training/information on energy, climate change New forms of participation	New knowledge, informative workshops for business Funding Positive experiences	Knowledge on market aspects and energy consumption Time Economic resources Qualified people
AG2	National and regional laws on RECs		Bologna as climate neutral city by 2030 Super Bonus 110% to improve energy efficiency	National and regional laws on RECs	Bologna Climate Neutral City by 2030 Citizens assemblies Climate contracts
AG3			Policies on transport decarbonization and sustainable mobility have been useful		
AG4			There should be more information campaigns on energy Policies to facilitate agreements with the big energy players		

Question AG	AG associated with engaging in GRETA				
			Environmental education as public policy Policies on civic participation (E.g., collaboration pacts)		

The interviews show that the different actors clearly identify the tangible and intangible resources they would need to advance the level of engagement.

Specifically, citizens, associations and firms require:

- one-stop shops at the city and district level;
- funds targeting families with low income and firms that have been facing financial troubles due to the recent energy crisis;
- better energy policies able to provide an integrated framework;
- alternative measures to incentives and bonus that tend to provoke socio-economic injustice;
- improving science communication;
- increasing energy literacy;
- clear and long-term institutional support;
- cultural change enacted by local schools and cultural centres
- better connection between school programs, activities in the neighbourhood with the involvement of different actors;
- more active role of the University: cultural mediations, communications, intermediaries between citizens and local institutions;
- improving soft skills that both bureaucrats and technicians should acquire to deal with the energy transition.

Moreover, additional institutional support is required from the Emilia Romagna Region with the regional law on the promotion of REC which provides specific funds

to those projects with social and territorial targets (such as measures to fight energy poverty and depopulation in isolated and inner areas).

3.5 Relational model associated with engaging in GRETA

This section describes the dominant model that moderates the relationships between the different actors and the preferred model of interaction expressed by each of them. According to the model proposed in D1.1 we considered four possible relational models:

Community Sharing (CS): Relationships that are based on a conception of some bounded group of people as equivalent and undifferentiated. In this kind of relationship, the members of a group or dyad treat each other as all the same, focusing on commonalities and disregarding distinct individual identities. The model motivation is based on intimacy and idealism but has strong basis on mutual structural support of the group and the individual.

Authority Ranking (AR): Relationships are based on a model of asymmetry among people who are linearly ordered along some hierarchical social dimension. People could be ranked according to different hierarchies. In AR relationships agency on resources denotes and displays rank differences.

Equality Matching (EQ): Relationships are based on a model of even balance and one for one correspondence (as in turn taking, egalitarian distributive justice, tit-for-tat retaliation, or compensation by equal replacement). People are primarily concerned whether an Equality Matching is balanced, keeping track of any asymmetry.

Market Pricing (MP): Relationships are based on a model of proportionality in social relationships people attend to ratios and rates. People in a market pricing relationship usually reduce all the relevant features and components under consideration to a singular value or utility metric that allows the comparison of many qualitatively and quantitatively diverse factors.

Analysis of relational models for citizens and associations

RM1: What type of the relation with government and regulators regarding the possibility to establish an energy community is currently in place?

- Citizens: Relationships with the local government and regulators can be defined according to the authority ranking (AR) relational model
- Association: Relationships with governments and regulators can be defined according to the authority ranking (AR) relational model

RM2: What type of relation would you prefer that is more in line with supporting the possibility to establish an energy community you prefer?

- Citizens: Citizens would like governments and regulators to have a more active role in supporting the development of REC (tending towards a community sharing model).
- Association: Associations complain about the lack of interest of the local government and would like the government to be informed and active on energy transition issues.

RM3: What type of the relation with companies regarding the possibility to establish an energy community is currently in place?

- Citizens: Relationship with companies can be defined according to the market pricing (MP) relational model
- Association: Relationship with companies can be defined according to the market pricing (MP) relational model

RM4: What type of relation would you prefer that is more in line with supporting the possibility to establish an energy community you prefer?

- Citizens: Relationship with policy makers and business would become more productive if moving towards a Community Sharing (CS) model.
- Associations: Relationship with policy makers and business would become more productive if moving towards a Community Sharing (CS) model.

For citizens, the relationship with other actors is mainly a distant one, mostly dominated by the lack of knowledge, support and understanding of possible interlocutors when it comes to policy makers or community leaders/facilitators. The lack of close relationship, trust and interaction is exacerbated by the fact that the relationships between policy makers are complex, require technical advanced knowledge and provides useless results to the purpose of establishing the energy community.

Concerning associations, Pilastro area presents a rich landscape of active citizens associations involved in several themes such as environment, ageing, wealth and sport, help desk for foreign citizens.

Analysis of Relational models for policy makers and facilitators

RM1: What type of the relation with citizens regarding the development of skills and policy supportive mechanisms, plans as well as mediation among different stakeholders to enhance a local energy transition where citizens are engaged is currently in place?

- Policy makers: Relationship with the citizens can be defined according to the authority ranking (AR) relational model
- Facilitators/intermediaries: Relationship with citizens can be defined according to the community sharing relational model

RM2: What type of relation would you prefer that is more in line with supporting the development of skills and policy supportive mechanisms, plans as well as mediation among different stakeholders to enhance a local energy transition where citizens are engaged you prefer?

- Policymakers: The local government believes that community centers have a crucial role to engage citizens in the energy transition. However, although policy makers recognize the value of a relationship with citizens, they would not prefer a relationship other than authority ranking.
- Facilitators/intermediaries: Facilitators would like to engage more with associations towards a community sharing configuration.

RM3: What type of the relation with companies regarding the development of skills and policy supportive mechanisms, plans as well as mediation among different stakeholders to enhance a local energy transition where citizens are engaged is currently in place?

- Policy makers: Relationship with companies can be defined according to the market pricing (MP) relational mode.
- Intermediaries/facilitators: Facilitators do not have any direct relationship with private companies.

RM4: What type of relation would you prefer that is more in line with supporting the development of skills and policy supportive mechanisms, plans as well as mediation among different stakeholders to enhance a local energy transition where citizens are engaged you prefer?

- Policy makers: The local government believes that incumbent energy player should be more involved in the local energy transition (for instance by investing in energy transition projects). The relationship then tends to an equality matching model.
- Facilitators: The facilitators would like to engage more private companies in an ecosystem of local business. The relationship tends to a community sharing model.

For policy-makers, all groups of actors are relevant. However, the type of relationships can vary greatly depending on the type of actors. Although citizens and local initiatives often try to contact politicians to articulate their demands, the relationship is not well developed and rather one-way. More established relations and contacts exist between politics and business.

Facilitators are committed in connecting with other actors, such as policy makers, associations, citizens and business.

Analysis of relational models for business

RM1: What type of the relation with government and regulators regarding the provision of clean energy to local companies is currently in place?

- Business: According to some business actors the relationship with governments and regulators can be defined according to the market pricing (MP) relational model; according to smaller business actors the relationship with governments and regulators can be defined according to the authority ranking (AR) relational model.

RM 2: What type of relation would you prefer that is more in line with supporting the provision of clean energy to local companies you prefer?

- Business: According to small business actors the local government should have a leading role in the local energy transition by ensuring that all citizens have access to affordable energy.

RM3: What type of the relation with citizens regarding the provision of clean energy to local companies is currently in place?

- Business: Relationships with citizens can be defined according to the market pricing (MP) relational model.

For business actors, current relationships are mostly based on informal relationships, on rationality, on needs, on functional interdependence. The business actors are mostly located in Roveri, configuring a community that is composed by transient inhabitants, city users who stay in the area only for a limited hours per day. They tend to not recognise themselves as belonging to a community but they are very much engaged in energy topics and committed to improve their behaviours.

3.6 Asymmetries analysis across actors

The GRETA research hypothesis assumed that Pilastro-Roveri would eventually reach the realisation of a Collaborative Energy Community, where the deployment of renewable resources produces zero emissions, waste is nearly zero and mostly recycled, suppliers meet sustainability criteria in production and people are aware and trained to fight climate risks according to a solidarity approach. In order to reach this long-term vision, GRETA envisions the transition of Pilastro-Roveri by nudging the local community to transit from unaware to active positions.

This section includes an overview across actors of different constructs, such as:

- (OUTCOMES [OUT]) the extent to which the engagement in GRETA (in specific behaviours) is regarded positive or negative by the civil society, governments, and the private sector. Outcomes that affect the actors themselves, society, the environment and climate change. These outcomes will be clustered in social, environmental and economic outcomes;
- (Social NORMS [SN]) the extent to which citizens, the policy and regulatory environments, and the private sector support the uptake of practices and solutions supporting GRETA;
- (AGENCY [AG]) the level of agency and resources available for the implementation of GRETA for each of the actors considered in the case studies: For citizens' agency and resources to engage in GRETA (income, knowledge, availability of time,, etc.); For the public sector, agency factors like financial resources, knowledge and the ability of existing administrative systems to substitute current means of delivering and using energy with new green energy innovations; For businesses' resources, knowledge on technical and administrative GRETA options.
- (RELATIONAL MODEL [RM]) the nature and congruence (between dominant and desired) of the social relational models that guide and determine the interaction between citizens, policymakers, and businesses.

In summary, the proposed set of hypotheses aim to test that the individual citizen engagement arises from internal and external sources. Internally the interaction of the individuals held values, agency, goals, and intentions, all play certain role on influencing engagement. Similarly, the perception and experience of the external determinants like influences from others, the context where the engagement takes place and the institutions moderating individuals' actions supporting the green energy transition. Table 5 below presents an overview of the behavioural patterns and asymmetries across actors.

Table 5 Asymmetry analysis for the Pilastro-Roveri case study

	Citizens	Associations	Policymakers	Business	Facilitators
Behaviour to reach the societal goal	acquire knowledge regarding energy systems and energy consumption to become part of an energy community in the next few years (2-3 years?) in the area of Pilastro-Roveri.	engage in the energy community and advocate for local environmentally sustainable actions to enhance the energy transition in the area of Pilastro in the next few years	provide knowledge, develop skills and policy supportive mechanisms, adopt plans and operative strategies to enhance a real local energy transition through, for example, an energy community in the Pilastro-Roveri area in the next few years	engage in the energy community by buying solar panels and installing them (when possible) on their buildings in the area of Roveri and provide clean energy to their companies and for the area of Pilastro - Roveri in the next few years	provide facilitations, coordination and mediation among different stakeholders to enable citizens engagement in the energy transition in the area of Pilastro in the next few years
Likely individual goal	reach individual economic benefits (reducing energy bills) and ecological ones (reducing CO2 emissions)	increase knowledge on energy issues; reduce energy bills and carbon footprint to actively participate in the energy transition; increase community cohesion and participation as well as community knowledge on energy and climate change	secure the political agenda and facilitate re-election; improve the city branding; improve the city standards and behaviors on climate-related issues; enhance the local energy transition and ensure higher quality living standards for citizens; achieve EU energy goals	reducing company's energy bills, improving business' green reputation (CSR) invest in social-related projects (tax incentives)	consolidate their role as city agency and intermediary acquiring the energy expertise; actively contribute to achieve climate neutrality in Bologna
Outcomes Advantages	good publicity for the neighborhood Social and economic advantages for the neighborhood	Environmental benefits Economic benefits Energy Independency and energy security	Environmental benefits on different levels (local and global) Economic benefits: reduce energy bills especially for those that face energy poverty issues Energy security and independence Reduce geopolitical tensions Building a sense of collectivity and community Empowerment of civil society Better energy consumption Change development and economic models	Energy security and independence Environmental benefits Economic benefits Networking with neighbors Energy auto sufficiency Sustainable consumption Environmental awareness and consciousness Territorial benefits Building a sense of collectivity and community	Deal with new, exciting, technical and normative issues that combine the engagement levels of citizens and new models of cooperation among actors. Innovative work Environmental benefits Opportunities to understand better socio-environmental relationships and interconnections Reduce the cost of energy bills
Disadvantages	Personal disadvantages: uncertainties on how to finance the REC and who will provide funding			Business disadvantages: uncertainties	

DELIVERABLE D3.1

<p>Social norms Drivers</p>	<p>GRETA researchers Local promoting committee of the REC Local associations/small business</p>	<p>Municipality (but which serious commitment?) University</p>	<p>Citizens; Third sector; Schools; Energy agencies; network Platform net zero cities; Business; University of Bologna Local associations and neighborhoods social centers (Case di Quartiere); New energy technologies (more accessible) National government and legislation</p>	<p>Regional application for funding renewable projects Qualified figures in the field of renewable energy and bureaucracy Regional/City institutions The Municipality of Bologna</p>	<p>Members of the foundation/association the municipality of Bologna the region of Emilia-Romagna, private actors public/private associations Schools Business GRETA researchers</p>
<p>Obstacles</p>	<p>Complicated technical languages Problems with communication and information Greenwashing practices Legislation, confusing normative framework Technological constraints (Italy does not produce solar panels...) Consumerist culture Local institutions</p>	<p>Language/Communication Too many technicalities to explain Lack of bottom-up participation</p>	<p>Big national energy players Unclear legislation Authority on cultural asset and heritage Indiscriminate forms of incentives Ministries (essential but hard to engage) Lack of energy/environmental culture and literacy Difficulties to communicate with citizens, to reach citizens with no technical expertise</p>	<p>Market logics and interests Bureaucracy Local institutions</p>	<p>The private sector</p>
<p>Agency Resources needed</p>	<p>Time Alternative channels to communicate news: local blogs, local events... Financial resources Formation/ information Sharing positive experiences</p>	<p>Time and economic resources Networking Formation/Information and new knowledge Qualified institutions and figures Public calls to build RECs Sharing positive experiences</p>	<p>Funding, financial resources and investments Human resources (experts on energy, on legislation and normative frameworks, on energy governance) New knowledge; formation/information on energy, climate change New forms of participation</p>	<p>New knowledge, informative workshops for business Funding Positive experiences</p>	<p>Market aspects Energy consumption Resources needed: Time Economic resources Qualified people</p>
<p>Opportunities</p>	<p>National and regional laws on RECs</p>		<p>Bologna as climate neutral city by 2030 Super Bonus 110% to improve energy efficiency Policies on transport decarbonization and sustainable mobility have been useful ("I see that in other countries</p>		<p>Bologna as climate neutral city by 2030 Climate citizens assemblies Climate contracts</p>

DELIVERABLE D3.1

			<p>there is more willingness to enable the transition")</p> <p>There should be more information campaigns on energy Policies to facilitate agreements with the big energy players Environmental education as public policy Policies on civic participation (E.g. collaboration pacts)</p>		
Relational models	Relationships with the local government and regulators can be defined according to the authority ranking (AR) relational model	Relationships with governments and regulators can be defined according to the authority ranking (AR) relational model	Relationship with the citizens can be defined according to the authority ranking (AR) relational model	<p>According to some business actors the relationship with governments and regulators can be defined according to the market pricing (MP) relational model; According to smaller business actors the relationship with governments and regulators can be defined according to the authority ranking (AR) relational model</p>	Relationship with citizens can be defined according to the community sharing relational model
	Citizens would like governments and regulators to have a more active role in supporting the development of REC	The associations complain about the lack of interest of the local government and would like the government to be informed and active on energy transition issues.	The local government believes that community centers have a crucial role to engage citizens in the energy transition	According to small business actors the local government should have a leading role in the local energy transition by ensuring that all citizens have access to affordable energy.	Facilitators would like to engage more with associations
	Relationship with companies can be defined according to the market pricing (MP) relational model	Relationship with companies can be defined according to the market pricing (MP) relational model	Relationship with companies can be defined according to the market pricing (MP) relational model	Relationships with citizens can be defined according to the market pricing (MP) relational model	The facilitators don't have any direct relationship with private companies
			The local government believes that incumbent energy player should be more involved in the local energy transition (for instance by investing in energy transition projects).		The facilitators would like to engage more private companies in an ecosystem of local business

3.6.1 Similarities and differences across actors

When looking at the behaviours across actors within the Pilastro-Roveri case study, it is clear that businesses, associations and citizens share the same societal goal since they are all willing to establish and become part of an energy community. This is related to the fact that all three actors are willing to reduce their energy bills, for personal reasons (citizens), environmental sensitivity (associations), reputation (business). Reputation (and branding) is also a motivation in the policy makers behaviour, which they share with businesses, but with the orientation towards a collective improvement of the life of citizens, as they value the environmental benefits if the REC establishment.

Furthermore, the behaviours and goals of facilitators are also partly similar to those of policy makers, since provide guidance and support to citizens in their transition towards the establishment of the REC. Facilitators and associations acquire a mediating role, providing and transferring knowledge between citizens and policy makers.

Concerning outcomes, all actors value the environmental benefits of engaging in being a part of a REC. They all want to increase the involvement and empowerment of citizens and of the mediating parties (associations, facilitators). However, regulatory uncertainties on energy policies make citizens and companies feel hampered in the implementation of a REC.

When it comes to social norms, the local context seems favourable to the realisation of a REC given that all actors identify a substantial number of stakeholders, public bodies and associations that can make a substantial contribution. In addition, recent regional legislation supporting RECs is helping to create a coherent framework that increases the overall confidence of all actors involved. However, when it comes to assuming responsibility and ownership of the processes, troublesome issues arise.

With respect to agency, time and clearer and more accurate information represent key factors for both citizens and associations, while businesses and policy makers identify finance as a crucial aspect. At the institutional level, the fact that Bologna won the application for the EU mission *100 climate-neutral and smart cities by 2030* represents a huge opportunity as the city is committed to achieving climate neutrality by 2030. In this regard, energy communities are identified as fundamental to achieve this desired goal. Essentially, given that energy communities represent an absolute novelty in Italy in terms of the project design, citizens' participation and operation of energy systems, all actors emphasise the need to identify new skills and new professional figures to manage the complexity of these processes.

There are of course differences between how actors perceive their responsibilities in the energy transition which lead to difficulties in terms of encouraging behavioural changes. For example, although the promotion committee for a REC in the Pilastro area is very active, citizens still require a top down change through a leading role of

local institutions. At the same time, given the lack of previous experiences of REC projects in a large city, it is still unclear who should be the first to act, leading to a general impasse. Facilitators have so far played an important role in engaging citizens, associations and local government; however they recognise that it is more difficult to engage businesses in participatory process. This is certainly an obstacle to behavioural change and will require more attention specially because both facilitators and citizens recognise that businesses, as capital holders, should be the first to make the investments for photovoltaic systems. Nevertheless, due to the above-mentioned regulatory uncertainty, they are still unsure of the sustainability of the investment.

In this context, the municipality of Bologna recognises its role as a mediator between the interests of local businesses, citizens and associations. The opportunity of the EU mission is therefore seen as a steppingstone to coordinate various actions on a local scale to accelerate the energy transition.

4 Discussion and reflection

Considering the results collected with the set of methodologies described above, we are able to reflect on the main results of the case study activities that might be relevant for political decision makers. Individual actors are key in addressing the energy transition. In particular, if they are empowered in their ability to understand, have in-depth knowledge of the problem and interpretative keys to finding solutions, they are able to open up unprecedented avenues for collectively valuable solutions.

In addition to information and data, actors involved in the delivery or concretisation of energy policies find limitations and barriers to access to both funding, clear and long-term institutional support. Bureaucratic-administrative barriers are frequently mentioned, especially in relation to the establishment of RECs.

The citizens, associations and companies interviewed emphasise the need for information infrastructures in the area (e.g. one-stop-shops at city and district level) that indicate both how to make improvements in their buildings and how to access bonuses, funding and incentives or alternative measures that can be accessed by those who do not have the capacity to understand how to apply for funding. These infrastructures can open up spaces for dialogue and projects, where actors can be active and intervene to resolve critical issues and resistance to energy transformation.

Currently, the role played by GRETA contributes to improving scientific communication and increasing energy literacy; however, the real cultural change is implemented by local schools and cultural centres. This point is indicative of the need for a better connection between school curricula, activities in the neighbourhood with the involvement of different actors; but also of the need for a more active role of the university especially in cultural mediation, communication, and intermediation between citizens and local institutions.

The main reasons why actors in the Pilastro-Roveri area engage in energy transition behaviour (i.e. drivers) are primarily related to cost-saving issues. The reduction of consumption, the choice of a sustainable means of mobility, up to joining energy communities, arise from the need to save money and reduce household (for residents) or company (for business) costs.

As far as policy makers are concerned, the motivation to pursue energy-efficient strategies or behaviours is still more linked to political consensus logics, although to a similar extent to orientations for the common good.

In the case of residents and citizens, there is a greater propensity on the part of community leaders, or in any case people already involved in associations of various

kinds working in the area, with a high level of schooling and economic capacity that allows them to invest their free time in informing themselves and consequently take corrective action on their behaviour.

The main reasons why citizens do not engage in energy transition behaviour (i.e. barriers) are related to the lack of clarity of objectives, lack of trust in institutions.

On the other hand, the barriers that prevent business actors from participating in energy transition concern a reduced energy culture or lack of facilitated procedures for accessing financing, excessive bureaucracy and finally the difficult evidence of economic benefit.

As far as policy makers are concerned, there is an issue about the soft skills that bureaucrats and technicians should acquire to deal with the energy transition. Considering this, a reflection on new ways of encouraging involvement and participation of those that are still disinterested or unable to have their say on the energy issue must necessarily be nurtured.

Within the Pilastro-Roveri case study, belonging to a self-promoting energy community creates a sense of responsibility towards the community of residents and commitment to individual and collective citizen engagement in the energy transition. This is true for both residents and business-related actors.

Social justice in the Pilastro-Roveri case study is of high importance. For many years, the residents of the neighbourhood have emphasised the need to make energy-related topics accessible to everyone, in order to make people understand, in a simple and clear way, how these topics can facilitate savings for every citizen and improve the liveability of their homes, neighbourhoods and condominiums. Even within one's own condominium, it emerges how cultural and language differences are a barrier to open and collaborative dialogue.

The need to reduce the intergenerational gap on energy and environmental culture also emerged, emphasising the need for greater collaboration and cooperation between different ages and skills. Another aspect that emerged is diversity, though not as a difficulty, but understood as a resource: differentiation and compensation are useful for having different profiles. The need to clarify what are the direct and indirect benefits of energy investments and sustainable choices is underlined, highlighting the externalities and possibly quantifying them, also from the point of view of the economic return in order to be able to think of an energy transition in all respects. Furthermore, there is strong criticism of government and regional policies for inconsistency between concrete choices and stated objectives, which may have something to do with people's reduced participation in initiatives dealing with energy issues.

Understanding in an easy and intuitive way the real savings, both economic and energy, e.g. by bringing the meter back inside the house/building and applying methods of reading the meter that everyone can easily understand, can be a solution. Increased awareness of one's own savings is in fact fundamental in order to build a solid base of trust in new solutions, especially for older people, who are the warriest. This last element is important, precisely since the average age of Pilastro residents is high. It is necessary to find new channels and forms of communication to transmit, directly or indirectly, all the actions carried out in a neighbourhood on energy/environmental issues to the population, in order to multiply the opportunities to raise awareness among the most sceptical. In addition, it may be sufficient to publicise some creative and inexpensive energy-saving solutions. Again, however, individual actions are linked to the importance of systemic action policies on the economic and development model.

Finally, policies to support sustainable individual behaviour in relation to energy transition activities in Pilastro-Roveri have different effects in the Pilastro part, which is predominantly characterised by business actors, or in the Pilastro part, which is predominantly residential.

On the business side, financial and incentive policies (thus more of a regional or national level) contribute more strongly to changing behaviour. On the other hand, in Pilastro, policies more oriented to individual households or owners, with a local or metropolitan dimension, allow behavioural changes and increased engagement to materialise.

5 Conclusion

The analysis highlighted the difficulty of involving the citizens of the neighbourhood, above all due to the strong socio-economic emergency since those who find themselves in conditions of poverty or social fragility do not consider the energy issue as a priority. Critical points related to the communities of the two areas can be summarised as:

- Pilastro community is experiencing a certain fatigue since the area and its citizens are often subject to large top-down projects that, when they terminate, leave the area with no benefits or added value; the community is very aware both of their stigmatisation and of their potentiality, but they fear to be exploited only for external purposes; on a positive note, the population is interested in the energy topic and in some case expresses the will to learn more, to share their knowledge and to get more attention from institutions such as the University, requiring a more stable presence in the area.
- Roveri community is composed of transient inhabitants, city users who stay in the area only for a limited hours per day. They tend to not recognise themselves as belonging to a community, but are very much engaged in energy topics and committed to improve their behaviours.

With respect to the theme of enabling methods and how to support an increase in awareness and an increase in energy efficient actions, the themes of knowledge and information appear to be key. The need to shared listening is highlighted not so much to arrive at a common position but to understand different positions and the reasons why one is not interested in that issue. These appear crucial but prove to be more effective if combined with an effective return and economic benefit. Indeed, incentives, especially economic ones, are seen as a key tool that can support the actions of parts of the population that would otherwise find it difficult to access them. From the table discussion it emerged that this is actually a primary need, since different groups of citizens would be ready to invest in energy efficient actions, but need economic support when these involve the installation and/or purchase of tools and materials. Finally, it emerges how these aspects must be supported by real activities of constant accompaniment of the community in its actions, not only at the start of the initiatives but over time.

Annex 1: Anonymized list of interviewees

Table 6 Positions and affiliations of interviewees in Pilastro-Roveri case study

Interview No.	Type of actor	Role	Date and place	Interviewer
1	Citizen	member of a committee for the establishment of a REC.	30.05.22 Pilastro	Coleandro G; Ruggieri B.
2	Citizen	member of a committee for the establishment of a REC.	09.06.22 Pilastro	Ruggieri B.
3	Citizen	member of a committee for the establishment of a REC.	08.06.22 Pilastro	Ruggieri B.
4	Policy makers	Regional representative	27.07.22 Online	Coleandro G; Ruggieri B.
5	Policy makers	Municipality representative	20.06.22 Online	Coleandro G; Ruggieri B.
6	Policy makers	Neighborhood representative	24.02.22 Online	Coleandro G; Ruggieri B.
7	Policy makers	Neighborhood representative	08.02.22 Online	Coleandro G; Ruggieri B.
8	Firm	Based in Roveri	01.04.22 Online	Coleandro G; Ruggieri B.
9	Firm	Based in Roveri	09.06.22 Roveri	Ruggieri B.
10	Association	Environmental	22.06.22 Online	Coleandro G; Ruggieri B.
11	Association	Environmental	22.06.22 Online	Coleandro G; Ruggieri B.
12	Association	Social	08.02.22 Pilastro	Coleandro G; Ruggieri B.
13	Facilitator	Supporting citizen engagement	20.05.22 Online	Coleandro G; Ruggieri B.

Interview No.	Type of actor	Role	Date and place	Interviewer
14	Facilitator	Supporting the establishment of solar communities	29.03.22 Online	Coleandro G; Ruggieri B.
15	Facilitator	Energy efficiency-related activities	25.03.22 Online	Coleandro G; Ruggieri B.
16	Facilitator	Supporting energy policies	14.02.22 Online	Coleandro G; Ruggieri B.

Annex 2: Guide for interviews

Part A – General Information

1. Name of interviewee
2. Demographics (age and gender)
3. Main activities

For policymaker and businesses:

1. Type Company or political organisation
2. Position in company or political organisation
3. Main activities

Part B – Past behaviour and planned actions

For citizens

1. For how long and why have you been actively involved in the process of establishing the energy community in the Pilastro-Roveri area?
2. Do you plan to continue to be involved in the process of establishing the energy community in the area? Do you think the promotion committee can help the establishment of the REC?

For policy makers

1. The candidature (and then selection) of Bologna among the 100 carbon neutral cities by 2030 is certainly an important step that the municipal administration has taken to meet the challenges of the climate transition: what actions does the Municipality intend to undertake in this strategic area to meet the objectives imposed by the Mission?
2. What weight can renewable energy communities have in the city's energy transition programme? What priorities do they have compared to other actions?

For business

1. Are you aware of the energy community project to be built in the Pilastro-Roveri area? Do you think it is important for your company?

2. Would you take part in the project to create the energy community in the area?
Had you already planned any energy measures? (e.g., solar panels on the roof)

For facilitators

1. Did you take an active part in the facilitation for citizen engagement of the REC Project in the Pilastro-Roveri area?
2. Do you plan to continue to coordinate and facilitate stakeholder engagement in the Pilastro-Roveri local energy transition?
3. In the long run, what do you think will be your organization role in facilitating the local energy transition?

Part C – Potential outcomes

For citizens

OUT 1 - What do you think could be the advantages/gains/benefits for the residents of the area in establishing and participating in the energy community in the coming years?

OUT 2 – What do you think could be the obstacles?

For policy makers

OUT 1 - In your opinion, what are the main advantages - or levers - capable of motivating the citizens of Bologna to commit themselves and actively participate in achieving their city's energy and ecological transition objectives?

OUT 2 - What obstacles do you think there are in the establishment of renewable energy communities in the Bolognese context and what strategies can be activated to overcome them?

For business

OUT 1 - What do you see as the advantages/gains/benefits for your company of setting up and participating in the energy community in the coming years?

OUT 2 - What do you see as potential obstacles?

For facilitators

OUT 1 - What do you think could be the advantages/gains/benefits for your organization in facilitating citizens engagement in the Pilastro-Roveri area in the next two/three years?

OUT 2. What do you think could be the obstacles?

Part D – Norms

For citizens

SN1 - Are there any actors (people, institutions, associations) that you think push/help/support the realisation of the energy community?

SN 2 - Are there actors (persons, institutions, associations) who you think are opposing or hindering your attempts to establish and engage in the energy community?

For policy makers

SN 1 - With which subjects/organisations do you consider it essential for the Municipality of Bologna to collaborate to foster the energy and ecological transition process? Of these, which do you consider most difficult to involve?

SN 2 - With which actors/organisations/bodies do you consider it essential for the region to cooperate and coordinate in order to guarantee and achieve the objectives of the law for the promotion of RECs, thus accelerating the energy and ecological transition process?

For business

SN 1 - Do you think there are people (people, institutions, associations) who could help you understand the REC project and sustain you during the first steps?

SN 2 - Are there any actors (people, institutions, associations) that you think are opposing or hindering the attempts to establish and engage in the energy community? What factors hinder REC? (e.g., innovation in energy and environment)

Part E – Agency to perform the behaviour of interest.

For citizens

AG 1 - What kind of skills and information do you think the promoter committee would need in order to stimulate/pursue the development of the ERC?

AG 2 - What kind of resources in terms of time/funding/financial resources do you think the promoter committee would need in order to foster the establishment of and participation in the REC? Do you have any experiences in dealing with energy/energy consumption/sustainable energy issues?

AG 3 - Are there people/institutions/circumstances that you think could help you in the process?

AG 4 - Do you think there are obstacles blocking your work?

For policy makers

AG 1 - What resources (economic, professional, human, technical) do you consider necessary for the administration to implement the first actions for local transition?

AG 2 - What kind of knowledge or information might be needed?

AG 3 - On the basis of your experience, what are the other main policies and/or actions that you consider effective and that have been used in the Italian and/or European context to promote energy transition?

AG 4 - What do you consider to be the most effective policies - funding, information campaigns, agreements with major players/multiutilities, etc.? - to encourage the involvement of citizens and businesses in energy transition actions?

For business

AG 1 - What kind of skills and information do you think your business need in order to further the development of a REC?

AG 2 - What kind of economic resources do you think your business would need in order to favour the establishment of a REC?

AG 3 - Are there particular circumstances/opportunities in the context of the city of Bologna that could help your business in the establishment of a REC? ?

AG 4 - Do you have any past experience in dealing with energy/energy consumption/sustainable energy issues?

For facilitators

AG 1 - What kind of resources, skills and information do you think FIU needs to become a part/developer of the REC?

AG 2 - Are there people or institutions that you think could help your organization in this process?

AG 3 - Are there any particular circumstances/opportunities you think your organization could rely on to foster participation in the energy transition and develop the REC?

AG 4 - Does your organization have experiences in energy- related issues regarding citizens engagement?

Annex 3: Additional questions from the first session of qualitative interviews

1. In the public debate there is more and more talk about energy transition; from your point of view, do you think this is an important topic to address? How aware do you think the public is of the topic?
2. What role should local institutions play in the transition process? (please indicate some options)
3. Do you think that in the Bologna/Pilastro context institutions are actually able to play this role?
4. What are the main difficulties related to energy services in the Pilastro district? How much and how does the socio-economic condition of the inhabitants of the district affect them?
5. What has been done in the Pilastro-Roveri area with regard to energy in recent years? Could you outline the progress of work on energy in the area over the last five years? (energy efficiency/efficiency, energy communities, electric mobility...)
6. How do you encourage the involvement of residents in the energy transition process? Do you think there are any obstacles in this regard? If yes, which ones in particular?
7. Who else, apart from residents, would it be important to involve in order to outline the next steps and implement actions necessary to facilitate the energy transition process in the area? (Please indicate one or two 'names') (associations, library, parish, school, condominium administrators...)
8. Do you believe that research projects such as GRETA can foster citizens engagement in the Pilastro-Roveri area?