

D4.4. Pilot Implementation Report



Deliverable Information Sheet

Version	1.0
Grant Agreement Number	101076753
Project Acronym	LIFE21-CET-ENERCOM-COMANAGE
Project Title	Developing a transnational governance and holistic integrated services framework supporting the sustainability of European energy communities
Project Call	LIFE-2021-CET
Project Duration	36 months
Deliverable Number	D4.4
Deliverable Title	Pilot Implementation Report
Deliverable Type	R – Document, report
Deliverable Dissemination Level	PU – Public
Work Package	WP4
Lead Partner	Ecoserveis
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Official Due Date	30.04.2025
Delivery Date	30.04.2025

History of changes

Version	Date	Comments	Main author(s)
0.1	15/04/2025	1st draft	Camila Canelas (ECO) Adrià Serarols (ECO)
0.2	22/04/2025	Peer-review	Metropolis, AMB
1.0	30/04/2025	Final version	Camila Canelas (ECO) Adrià Serarols (ECO)

List of Acronyms

BoR	Board of Replicators
COP	COMANAGE Open Platform
DSS	Decision Support System
EC	Energy Community
ECGT	Energy Communities Governance Toolkit
EPAH	Energy Poverty Advisory Hub
EU	European Union
KPP	Knowledge Providers Partners
OIS	Operational Integrated Services
OSS	One Stop Shop
PV	Photovoltaic
REC	Renewable Energy Community

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Executive summary

This report provides a detailed account of the implementation actions carried out by the project pilots in the regions of AMB (Spain), LAZIO (Italy), and KMA (Poland) as part of the COMANAGE project. COMANAGE aims to facilitate the development and maintenance of energy communities across the European Union (EU), promoting sustainable energy practices and fostering community-driven solutions to energy challenges.

The report complements the monitoring and evaluation outcomes presented in D5.3 Pilot Executive Plans Periodic Report, which was focused on assessing the performance of the project based on predefined indicators and objectives. In contrast, this Pilot Implementation Report offers a more descriptive overview, focusing on the specific services and actions implemented by the project pilot in each region. The report outlines the methodologies, strategies, and key milestones achieved in AMB, LAZIO, and KMA, highlighting the local context, challenges, and successes encountered during the execution of the project.

Through the actions undertaken in these regions, the report also reflects the diversity of approaches adopted in each pilot, offering valuable insights into the practical application of the outcomes of the project, those being the Energy Communities Governance Toolkit (ECGT), the E-learning platform and the Decision Support System (DSS), in different socio-economic and regulatory environments. Additionally, it showcases the lessons learned, best practices, and the potential for replication in other regions, both European and non-European. This document serves as a crucial resource for stakeholders, policymakers, and practitioners interested in the development of energy communities, providing practical knowledge to support future initiatives in the transition to more sustainable and inclusive energy systems.

1. Introduction

Over the past years, several projects boosting energy communities have seen the light around the EU. The launch and implementation of these initiatives carried out -among others- by projects in which the members of the COMANAGE partnership participate, has made evident that once started energy communities' projects often struggle to take-off. The COMANAGE proposal originates from this experience, with the aim of tackling and counteracting the main governance and management barriers - including a series of legal, administrative, financial, social, and organizational hurdles – faced by citizen-led and public-participated energy communities' projects.

Since it started, COMANAGE project has made significant progress in supporting energy communities, particularly through the provision of innovative tools for managing energy resources. This report underlines the main activities, and the specific tools developed, which are the result of a qualitative study of needs and barriers that existing Energy Communities identified as hindering their own sustainability and expansion. The energy communities involved in the pilots have been testing these tools with the support of the previously defined Hub Managers at each of the three pilot areas: Barcelona Metropolitan Area, Krakow Metropolitan Area, and the Lazio region. It is worth noting that their input and feedback its being collect throughout the project to keep improving the project outcomes based on real needs and barriers.

2. Methodology

The work done in COMANAGE has been focused on the creation of the COMANAGE Open Platform (COP) which includes the main three outcomes of the project, the Energy Communities Governance Toolkit (ECGT), the E-learning platform and the Decision Support System (DSS). COMANAGE has been focused on testing and refining the different outcomes across the different pilot countries. To do so, the project has followed a 3-step methodology, that consisted of (1) identifying needs, (2) developing tools, and (3) Testing and refining.

Identifying needs

Mainly done through the creation of the methodological and operational **Energy Communities Governance Framework** (see D2.1 Energy communities' holistic framework and collaborative methodology) and D2.2 Energy Communities barriers, needs and best practices analysis, which provides an extensive analysis on the existing initiatives in the pilot countries and a review on the available literature. These reports provide useful insights on the barriers and challenges faced by the Energy Communities, the regulatory framework in each country, capacity building needs, primarily within the Public Authority staff, different Energy Community (EC) business models and best practices on the different EU countries.

Developing tools

Besides the project Knowledge Providers Partners (KPP); Ecoserveis, Co-opAbility, Aisfor, and ANESE, a Board of high-level experts has been created to help in the development and definition of the integrated services, tools, and other supporting mechanisms to guarantee the necessary

y support to energy communities, so they have the necessary tools and skills to address governance, management, and other existing barriers and challenges. The COMANAGE consortium, together with the external experts have built a theoretical and practical framework to follow towards guaranteeing the proper management and governance of energy communities.

For each strategic component, and in line with the Executive plans drafted in each pilot areas, partners developed customized tools. In the **Legal** area, models for statutes, deeds of incorporation, and internal regulations for Renewable Energy Communities (RECs) are provided, along with answers to legal questions and facilitation of public-private partnerships. In the **Social** sector, tools are available to ensure compliance with statutory and regulatory objectives, with a strong emphasis on social inclusion, for example, a plan for Tackling Energy Poverty or a Decalogue to foster equality, inclusion and intersectionality have been developed. For the **Communication** area, support is offered in developing communication and promotion plans, including educational content. In the **Financial** sector, examples and strategies for financing RECs are provided, enabling informed decisions on financial aspects. The **Technical** area promotes knowledge exchange among RECs to improve technical skills and set clear, achievable objectives.

Testing and refining

The Operational Integrated Services (OIS) Hubs activities and the Pilot Executive Plans have been ongoing throughout the project, to test the developed materials with the objective of equipping energy communities to be able to overcome

barriers and exploit their potential. Along the project, their input will be being used to improve all developed materials and to refine the initial toolkit prototype, which will result in a final version of the ECGT by the end of the project.

The project initially foresaw engaging at least 5 replicators from other EU and non-EU metropolitan areas, at the moment 9 replicators are already engaged through a signed commitment letter and taking part on capacity building process, knowledge exchange and Replication actions, and Metropolis together with Co-opAbility and Ecoserveis worked on the cocreation of an Action Plan to be followed by replicators members. Besides that, the first version of the Sustainability, Replication and Exploitation plan has been submitted, defining strategies to be followed by the consortium to maximise the project's reach, visibility, and sustainability beyond the project lifespan.

To write this document, Ecoserveis has gathered inputs from the three pilot partners, following the information already provided in early reports. Each partner has been responsible to update the information regarding the work done in their country, and Ecoserveis has overseen merging and adding complementary contextual information, as well as conclusions.

3. AMB Pilot Implementation

3.1. Implementation objectives

During the deployment of the piloting implementation activities, AMB initially aimed to fulfil the following goals:

1. Encourage **active involvement of citizens** in decision-making processes, and implementation of energy-related activities.
2. Enhance the **knowledge** and **skills** of community members in energy management and sustainable practices.
3. Establish an **efficient system** for **monitoring** and **evaluating** the pilot performance.
4. **Strengthen collaboration** with key stakeholders such as local authorities, energy providers, and community organizations.
5. **Raise awareness** about COMANAGE, the Catalan Pilot and its benefits among the target audience.
6. Establish a **framework** that aligns with legal requirements and promotes a smooth service implementation process.
7. Create a **comprehensive repository** of **documents** and **lessons learned**.
8. Facilitate **knowledge sharing** within the COMANAGE team and with external stakeholders for continuous improvement.

3.2. Action plan implementation

The primary concept behind the definition of the AMB service within COMANAGE can be framed in the already existing project "**La Teulada**." La Teulada is designed as a comprehensive **One Stop Shop (OSS)** service incorporating both an on-site service and an online assistance platform. The core objective of this initiative is to offer support and guidance regarding solar energy to residents in all **36 municipalities** within the metropolitan area of Barcelona.

The **online component of the OSS** allows residents to access assistance through a dedicated website or a specified phone number, ensuring ease of access for those seeking information or support. After the initial contact, detailed information is gathered for each case, addressing the specific inquiries of the user. Each case undergoes a meticulous examination, with information being communicated and discussed through video calls, or face-to-face meetings. To elaborate a personalized report some crucial information has been collected specifically related to the type of building, the address, the electrical consumption, and future energy needs. La Teulada comprises a total of **9 physical OSS spaces**, including 5 provided by AMB and 4 by municipalities of the metropolitan area. The users of La Teulada are personally received by a technician, after having pre-scheduled an appointment. The **overall goal** within the project is to integrate this service

with various tools developed within COMANAGE, aiming to enhance and broaden the scope of the service, benefiting both municipalities and the general public.

La Teulada has played a pivotal role in supporting the creation of a new energy community in Cornellà de Llobregat by providing technical assistance. This support has helped the community navigate challenges and establish a solid foundation for sustainable energy management.

Additionally, La Teulada has assisted two multifamily buildings in Sant Cugat del Vallès in setting up two shared self-consumption systems, each exceeding 100 kW. These projects demonstrate the platform's capability to enable large-scale, collaborative energy solutions.

The AMB has supported, through the One-Stop-Shop counselling office in self-consumption and Photovoltaic (PV), *La Teulada*, the 4 following energy community initiatives: 1 CEL La Bastida (Cornellà del Llobregat), 1 CEL Floresta (Sant Cugat del Vallès), and 2 shared-self consumptions in Sant Cugat del Vallès, which constitute the real-life implementation sites carried out to this date by the project.

Apart from the previous 4 supported initiatives, the AMB has also launched the *CEL Grup Llinàs* (Sant Vicenç dels Horts), making a total of 5 energy initiatives launched in the AMB.

Currently, there are around **20 initiatives** in the Metropolitan Area of Barcelona in various stages: some of them are under consideration, others in the process of creation, or in the early stages of the project. 5 of those initiatives stood out in this whole process of creation and interacted with AMB OSS service, La Teulada.

AMB organized, with the support of Ecoserveis, an event on **November 30, 2023**, targeting energy transition officers from the municipalities within the Barcelona metropolitan area. During this session, participants were invited to provide feedback and suggest improvements and additional functionalities that they believed would be beneficial for the tools available on the COMANAGE open platform.

The main contributions from participants primarily focused on the content of the E-learning course available on the platform. Many of the suggestions were successfully incorporated, including requests for more specific content on energy communities, practical case studies, and guidance on the implementation of local initiatives.

The members involved in the OIS Hub included **23 public servants** from 17 different municipalities and **11 employees** from the AMB, including officers from the energy transition office and the environmental education office. In addition, a representative from the Federation of Installers of Catalonia (FEGICAT) and Km0 Energy, a local energy promoter, were brought to present projects they have been working on related to energy communities, with the aim of empowering the different municipalities in implementing and promoting similar initiatives.

The activities carried out by the project in October 2024 (M24) helped to reach local and regional governments that showed interest in the project. Now that the E-Learning training platform is launched, further activities are planned to increase the number of stakeholders reached in the following months.

Still, AMB faces a unique challenge in terms of photovoltaic (PV) installations due to the presence of multi-family buildings poses difficulties, and a fragmented social fabric, which make the creation and development of energy communities challenging. This distinctive context adds complexity to the establishment of energy projects in the area

On the other hand, as for the policy and legal level, AMB has contributed to a draft of the Royal Decree regarding the development of the figures regarding RECs.

At the OIS HUB, 1 Full-Time Employee (FTE) has been contracted dedicated exclusively to the project.

The total final energy savings triggered by the project in the AMB come from the recently installed solar power in the AMB since January 2023 from the Catalonia's Auto-consume Observer (that depends on the Government of Catalonia), which is also the main investment in local renewable energy triggered by the project. It is estimated that 2% of the total energy saved corresponds to the project's actions. Because of the focus on PV energy, which generate great amounts of energy because of the many hours of sun available in Catalonia, the renewable energy generation and energy savings already doubles the target, confirming the commitment of the AMB towards a new energetic system that prioritizes clean energy generated locally.

During the first months of 2025, improvements have been carried out on both the DSS and the COP, and they have been launched successfully. Same has been regarding the completion and launch of the E-Learning platform, which includes contents both in Catalan and Spanish, as well as voice-overs that follow along the visual content of the modules. In April 2025, an OIS HUB Meeting has been carried out where all the tools were presented to the stakeholders and municipalities. A campaign to foster training participants will follow the next months.

In terms of promoting replication of the AMB pilot hub outcomes beyond COMANAGE Consortium partners, the AMB has participated in all the international knowledge exchange online sessions developed by Metropolis and Co-opAbility among the members of the COMANAGE Board of Replicators (BoR). The AMB experience along with a real experience from an Energy Community supported by “la Teulada” were shared during the session to foster COMANAGE project’s replicability. Moreover, the AMB pilot hub experience was presented during the last edition of the Smart Cities Barcelona World Congress helping with the promotion and dissemination of the COMANAGE project achievements. A closer approach with Diputació de Girona, as member of the BoR, in order to replicate and scale up the AMB pilot hub’s outcomes is foreseen to be maintained beyond the project’s implementation.

4. KMA Pilot Implementation

4.1. Implementation objectives

As in Poland the concept of Energy Communities is still relatively new and there are no relevant initiatives in the territory, the pilot in KMA has been focused on the following objectives, which have been considered fundamental for a solid service definition:

1. Providing the necessary **knowledge** about energy communities, especially energy cooperatives, to participants, to raise awareness and foster the creation of new collective projects.
2. Providing **expert support** to all OIS Hub participants.
3. Promoting and sharing **the COMANAGE products** (ECGT, DSS, and E-Learning), thus filling the knowledge gap among participants.

4.2. Action plan implementation

In Poland in 2023, the participatory process within the OIS Hub was characterized by 4 meetings, respectively on the following dates:

- **22 September 2023** – introduction to the COMANAGE project, presentation of the objectives and expected results of the project. Presentation and workshop of the Energy Communities Governance Toolkit - ECGT.
- **27 October 2023** - presentation of the COMANAGE Open Platform and specific session about EC legal aspects.
- **8 November 2023** – presentation of the COMANAGE products timeline, with a specific session focused on energy poverty, the Energy Poverty Advisory Hub (EPAH) and energy demand in Poland.
- **8 December 2023** – presentation of the COMANAGE products for the citizen involvement: the Participation Plan and Energy Poverty Tackling Plan.

Overall, the **total number of participants** in the OIS Hub in Kraków Metropolitan Area in 2023 was **34**. But in 2024 the number increased to 53 participants. The **members** of the IOS Hub were mainly civil servants and local authorities operating in the Kraków Metropolitan Area. Within the Krakow Metropolitan Area there are two energy cooperatives made up entirely of local government entities, one cooperative made up of private entrepreneurs and an energy cluster made up from several municipalities.

As part of the COMANAGE activities foreseen between 2023 and 2024, different experts were hired to help develop and create the necessary tools. On the one hand, the **legal expert** has developed:

1. Templates of documents useful for the establishment of energy cooperatives
 - a. Statute of the energy cooperative - model with explanation

- b. Model contracts for the lease of part of the property (roof/land) for the purposes of the energy cooperative
 - c. Model contracts for the sale of electricity for the purposes of an energy cooperative
2. Legal opinion on municipal financial incentives for energy cooperatives. The analysis showed that the current financial incentives are not profitable for communities.

On the other hand, the **technical expert** developed the Billing Model tool, in response to the issue of the lack of an available free tool for settling energy and payment transactions between members of an energy cooperative. A model has been prepared for energy and payment settlements between producer members, consumer members, and the energy cooperative itself. This tool ensures clear and accurate financial transactions, facilitating efficient energy management within the cooperative.

In addition, experts' materials have been used in the E-learning course, allowing the course users to expand knowledge in an accessible format.

To expand the potential of COMANAGE products and activities, KMA invited participants to its Energy Forums and provided information and access to the ECGT, the COP, and other COMANAGE products to all municipalities of KMA as well as other interested stakeholders.

In 2024, there were four meetings of OIS Hubs, which covered the following topics.

- **February 15, 2024** - The objectives and goals of the COMANAGE project were presented and the next steps were discussed, including the creation of an E-learning platform, the COMANAGE Open Platform, and the planned employment of an energy expert. The templates prepared by the legal expert were presented.
- **April 11, 2024** - The progress of the COMANAGE project was discussed. The status of the project products was also discussed, as well as possible ways of cooperation with the expert, Mr. Maciej Soltysik of the Institute of Projects and Analysis. The Resident Engagement Plan and the Energy Poverty Plan were presented.
- **September 12, 2024** - The COP and the E-learning course were presented and made available to users.
- **November 14, 2024** – The different tools were evaluated. First, participants had the opportunity to test the ECGT, the E-learning course and the DSS. Then, they had to fill out questionnaires to allow them to adjust the quality of the project's products to their own expectations and needs.

In 2025, 3 OIS HUB meetings have been planned, in addition to that KMA using the existing budget for subcontracting two additional experts. The first expert will be employed to develop models of EC and methodology for conducting energy analysis. The second will train KMA municipal staff on communicating with residents affected by energy poverty.

In terms of promoting replication of the KMA pilot hub outcomes beyond COMANAGE Consortium partners, the KMA has participated in all the international knowledge exchange online sessions carried out by Metropolis and Co-opAbility among the members of the BoR. The KMA experience has showcased its own project to foster COMANAGE project's replicability, specially to look for synergies with Warsaw, one of the BoR members.

5. ANCI LAZIO Pilot Implementation

5.1. Implementation objectives

At the beginning of the pilot implementation in the Lazio Region, ANCI Lazio identified a set of key objectives aimed at laying the groundwork for the establishment and scaling-up of Energy Communities, especially in small- and medium-sized municipalities. These objectives included:

1. **Raising awareness** among local authorities and citizens about the potential of Energy Communities as a tool for energy transition, local development, and social cohesion.
2. Strengthening the **capacity of municipal staff** and local stakeholders through targeted training, guidance, and participatory tools.
3. Supporting the development of **inclusive and replicable governance models** for Energy Communities, in line with the Italian regulatory framework.
4. Promoting the adoption and testing of **COMANAGE tools** (ECGT, E-learning, and DSS) in real contexts.
5. Facilitating the emergence of pilot **EC initiatives** by fostering dialogue between municipalities, citizens, and technical/financial experts.
6. Contributing to a **regional and national narrative** on the role of local authorities in enabling and coordinating Renewable Energy Communities.

Over the course of the implementation, the objectives were partially adapted to respond to emerging needs, such as the necessity to provide legal and technical support to early-stage ECs, the importance of tailoring communication strategies to local contexts, and the increasing role of ANCI Lazio as a regional facilitator and knowledge broker.

5.2. Action plan implementation

ANCI Lazio has played a pivotal role in strengthening Renewable Energy Communities through an ongoing participatory process, actively involving citizens, local governments, and REC members. In collaboration with AISFOR, ANCI Lazio has been driving an awareness campaign for the COMANAGE E-learning course, which has already seen the participation of 110 individuals, contributing to the dissemination of knowledge about RECs and their development in the territory.

Some of the main highlights of the implementation timeline are:

- **January 31, 2024:** Presentation of COMANAGE at Sapienza University during the “Stakeholders and Practice Observers’ Rome Pilot Meeting” (Sun4All project). The session included a dedicated focus on energy poverty and the role of RECs in the Italian context.

- **February 20, 2024:** Training event held at the Lazio Region headquarters to explore the tools developed by COMANAGE. The event also focused on synergies with other similar projects such as LifeSMART, Sun4All, and DISCOVER, aiming to create an integrated ecosystem to maximize opportunities for RECs. The event, supported by the World Energy Council (WEC) Italy, saw 58 participants, including local government representatives, REC members, universities, NGOs, and the cooperative/associative sector. Furthermore, 35 participants signed up to test the COMANAGE Toolkit.
- **February 27, 2024:** COMANAGE was presented at the Territorial Design Table – Renewable Energy Communities organized by Unioncamere, DINTEC, Rieti Viterbo Chamber of Commerce, and the “Centro Italia” Special Agency. The event brought together 21 participants and highlighted the project's potential to strengthen RECs at the territorial level.
- **March 20, 2024:** Presentation of COMANAGE at the CAIANO SOLARE REC in Rocca Priora, attended by 19 people. This meeting allowed for a direct engagement with the local community to explore COMANAGE's opportunities on the ground.
- **March 23, 2024:** Informal training session at the Ventotene REC, focusing on opportunities provided by the new Ministerial Decree. The event, attended by 25 people, was valuable for discussing the action plan for 2024 and reinforcing the national REC framework.
- **May 16, 2024:** Dialogue with the “RinnovAnguillara” REC at the Municipality of Anguillara, conducted online with key members, including Mauro Annunziata.
- **October 2, 2024:** A peer-to-peer meeting, held alongside the project Consortium Meeting in Rome, engaged several RECs to discuss updates to the COMANAGE Toolkit. Six representatives from the RECs “Scenario B – Le Vele” and “A otto minuti dal sole,” as well as project designers representing informal citizen groups in Mentana and Fonte Nuova, participated in the session, with the aim of forming a new REC in the future.
- **October 3, 2024:** COMANAGE was presented at a meeting organized by UNICOOP, with 14 participants.
- **October 9, 2024:** Strategic dialogue with NEXT and Tor Vergata University.
- **October 17, 2024:** Presentation of COMANAGE during a seminar organized by the Metropolitan City of Rome, within the framework of the LIFE SMART project, at the Municipality of Roccagiovine, with 35 participants.
- **October 25, 2024:** Online mutual learning session in collaboration with Rieti Viterbo Chamber of Commerce and “Centro Italia,” attended by 50 people. The session focused on sharing best practices and challenges in implementing RECs.
- **November 30, 2024:** COMANAGE was presented during a seminar dedicated to building a new REC in the Municipality of Fonte Nuova, with a special focus on the Ventotene pilot area. The meeting saw the participation of approximately 40 people and provided a valuable opportunity for exchanging experiences among the participants.
- **December 4, 2024:** In collaboration with AISFOR, COMANAGE was presented remotely at the project meeting for the Smart LIFE project in Nice.

At least four additional meetings are planned (2 in person and 2 online) for training activities and peer-to-peer dialogue to facilitate mutual learning exchange among Renewable Energy Communities (REC) during 2025. In this regard, a collaborative agreement proposal has been prepared with the Viterbo and Rieti Chamber of Commerce in order to have a more widespread impact across Lazio region.

By now, around 34 Energy Communities (RECs) in Lazio have been engaged and participated in the meetings organized. Among them, the following have received more substantial support:

1. Ventotene Renewable Energy Community (CERV), [REC]: Supported during the 4th OIS Hubs event.

2. "Caiano Solare - APS" (REC): Provided support for organizing a meeting at the parish in Rocca Priora on March 20, 2024, and offered technical assistance to enhance the visibility of the REC.
3. Citizens of Fonte Nuova Municipality: Aiming to establish a REC, their representative attended the peer-to-peer meeting on October 3, 2024, in Rome. They received specific support in utilizing the COMANAGE toolkit and scheduled an event for November 2024.
4. "RSEC Anguillara" (REC): Assisted with their communication strategy and addressed technical queries in support of the REC.
5. Roccagiovine REC Project: Co-organized the event on October 17, 2024, and supported through the Toolkit.

Up to now, many people in the Lazio region haven been reached by the different activities and it is foreseen that thanks to the collaboration with the Chamber of Commerce of Viterbo and Rieti, the impact will be much bigger and broader in the region.

In terms of promoting replication of the ANCI Lazio pilot outcomes beyond COMANAGE Consortium partners, ANCI Lazio has participated in all the international knowledge exchange online sessions carried out by Metropolis and Co-opAbility among the members of the BoR. ANCI Lazio experience has showcased its own project to foster COMANAGE project's replicability, especially in the search for synergies with Rome, a member of the BoR.

6. Conclusions

The implementation ECGT in three European regions – Barcelona, Lazio, and Kraków – has been a transformative initiative in supporting and empowering local communities in the energy transition. The use of an E-learning platform, a collection of documents and templates, the financial accounting tool, and the DSS have provided essential tools to facilitate the management and development of community energy projects.

Even though, project outcomes have not yet been tested equally in all regions, they have shown the effectiveness of these tools in enhancing the capacity of local stakeholders, reducing administrative complexity, and improving access to key resources. In particular, the E-learning platform has proven to offer a flexible and accessible means for ongoing training of community members, while the collection of documents and templates provides practical materials to ease the implementation of energy initiatives.

The recent introduction of the financial tool has been an important step in improving transparency and the economic sustainability of projects, even though further conclusions will come after being fully tested. Meanwhile, the DSS has been a standout innovation, offering a space for quick inquiries and specific responses for communities, improving guidance and resolving doubts in real-time.

The effective results from these pilots demonstrate the significant potential to expand such tools to other European regions or beyond Europe, fostering the creation of more autonomous and resilient energy communities. The transnational sustainable collaboration between cities and the lessons learned during the implementation will be key in advancing towards a more sustainable, just, and participatory energy model.

The last project phase will be focused mainly on the presentation of the tools and their dissemination, while incorporating improvements when possible, aiming to find stakeholders and individuals interested in using them. More results on this will be available in the Pilot Executive Plans Final Report (D5.4).