

D5.3. Pilot Executive Plans

Periodic Report



Deliverable Information Sheet

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List of Acronyms

AMB	Metropolitan Area of Barcelona
ANCI LAZIO	Lazio National Association of Italian municipalities in Italy
COP	COMANAGE Open Platform
DSS	Decision Support System
EC	Energy Community
ECGF	Energy Communities Governance Framework
ECGT	Energy Communities Governance Toolkit
ECO	Economic
ENV	Environmental
EPAH	Energy Poverty Advisory Hub
EU	European Union

FEIGAT	Federation of Installers of Catalonia
FTE	Full-Time Employee
GHG	Greenhouse Gasses
KMA	Krakow Metropolis Association in Poland
KPI	Key Performance Indicator
NGO	Non-Governmental Organization
OIS	Operative Integrated Services
OSS	One-Stop-Shop
PEF	Primary Energy Factor
PV	Photovoltaic
REC	Renewable Energy Community
RSEC	Renewable and Solidarity Energy Communities
RES	Renewable Energy Source
SOC	Social
WEC	World Energy Council

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Keywords list

- Energy Communities
- Citizen-led Energy Initiatives
- Governance Framework
- Energy Communities Governance Toolkit
- Sustainability
- Social Impact
- Economic Impact

- Environmental Impact
- Key Performance Indicators (KPIs)
- Monitoring Program
- Capacity Building
- Stakeholder Engagement
- Innovation
- Gender Equality
- Community Empowerment
- Resource Conservation
- Renewable Energy
- Greenhouse Gas Emissions
- Energy Savings
- Collaboration
- Policy Development
- Vulnerable Consumers
- Local and Regional Governments
- Investment
- Job Creation
- Decentralized Energy
- Environmental Resilience
- Sustainable Energy Practices
- European Union
- Decision Support System (DSS)
- Digital Hub
- Replication Workshops
- Community Engagement
- Innovation Hubs
- Policy Makers
- Legal Expertise
- Energy Experts
- Community Development
- Stakeholder Cooperation
- Project Impact

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1. Executive summary

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.

It will do so by creating a methodological and operational **Energy Communities Governance Framework (ECGF)**, and by equipping public authorities involved in energy communities' projects with a set of integrated services, supporting mechanisms and tools aimed at facilitating the management and governance of energy communities and other forms of citizen-led energy initiatives, ensuring their growth and sustainability in the medium and long term: the **Energy Communities Governance Toolkit (ECGT)**.

The final goal of the project will be twofold: first, to ensure that the energy communities' projects that have already been set up can take off and grow in the medium and long term. Second, to encourage and stimulate the uptake of new community-owned energy projects. With this goal in mind, the project will on one hand operationalize a transnational network of knowledge and competence providers; on the other, it will mobilize, engage, and operationalize key stakeholders around three Operative Integrated Services (OIS) Hubs to be established in three Pilot Cases across the European Union (EU) represented in the consortium by the Metropolitan Area of Barcelona in Spain (AMB), the Krakow Metropolis Association in Poland (KMA), the Lazio National Association of Italian municipalities in Italy (ANCI LAZIO).

Key activities include disseminating information to raise awareness and involving stakeholders through knowledge-sharing events and digital tools like the Decision Support System (DSS). While pilots face challenges such as limited funding for home rehabilitation and low citizen engagement, the project emphasizes collaboration to overcome these obstacles.

Future steps focus on refining tools based on stakeholder feedback, hosting peer-to-peer sessions, and consolidating learnings through workshops. The final project report will capture best practices, ensuring long-term impact and supporting replication efforts for inclusive energy transitions.

This document works not only as a checkpoint for the pilots to have a clear picture of the evolution of the project, but also as a base for the last deliverable of this working package, D5.4 *Pilot Executive Plans Final Report*. On this deliverable, each pilot will make an update of its State-of-the-Art, report a selection of the KPIs, assess those values against their objectives, and present their obstacles, challenges, conclusions and next steps towards the final report. Next, an introduction to the replicators will be presented and, finally, a generalist analysis of the obstacles, challenges, conclusions and next steps of all the partners will be presented to have an overall view of all these aspects.

2. Introduction

The purpose of this deliverable is to make a **periodic monitoring** collecting the values of some of the most relevant Key Performance Indicators – KPIs from all three areas (social, economic and environmental), to monitor the performance of the deployed Pilot Executive Plans, in order to assess the evolution of the project, providing quantifiable evidence up to this date of the potential of the Energy Communities Governance framework and toolkit for the uptake, management and long-term sustainability of energy communities' projects.

This periodic assessment will measure the Pilot Executive Plans success against objectives. The results of the analysis will allow us to draw conclusions on the entire project processes and will feed the fine-tuning of the Prototype.

In the **social impact dimension**, the KPIs focus on measuring the project's efforts in supporting energy communities and citizen-led energy initiatives, the capacity building of local and regional governments, stakeholder engagement, and the development of legislation and policies at various governance levels. Additionally, qualitative KPIs have been included to assess the project's impact on community cohesion, environmental awareness, well-being, trust in institutions, and empowerment of women and vulnerable groups. These qualitative indicators provide valuable insights into the project's broader social impact and community outcomes.

The **economic impact dimension** comprises KPIs that measure the project's contributions to innovation, investment in sustainable energy, female leadership in initiatives, and the participation of vulnerable consumers in energy communities. These KPIs assess the project's effectiveness in mobilizing the local economy, creating jobs, and promoting gender equality.

The **environmental impact dimension** focuses on KPIs that evaluate the project's success in achieving energy savings, renewable energy generation, and reductions in greenhouse gas emissions. Measuring the project's environmental outcomes ensures that sustainable practices and ecological resilience are promoted.

This monitoring work package's lead beneficiary, in this case, is AMB. Moreover, this report involves active participation from the other two pilots, ANCI and KMA, as well as support from ECOSERVEIS, Metropolis and SPXL. For every pilot, the measure of the plans' success against objectives is structured as follows:

- **Section 1** will be an update of the State of the Art embodied in report *D3.2 Pilot Executive Plans and description of the OIS Hubs* for the three OIS Hubs, summarizing any new outcomes, achievements, or comments that have emerged since the writing up of the mentioned deliverable.
- **Section 2** will report the values of the selected Social KPIs at M24 (October 2024), their comparison with the respective targets, and the justification of these numbers for each of the three Pilots.
- **Section 3** will report the values of the selected Economical KPIs at M24 (October 2024), their comparison with the respective targets, and the justification of these numbers for each of the three Pilots.

- **Section 4** will report the values of the selected Environmental KPIs at M24 (October 2024), their comparison with the respective targets, and the justification of these numbers for each of the three Pilots.
- **Section 5** will assess these KPI periodic reports against the objectives of each of the three Pilots.
- **Section 6** will present any obstacles or challenges faced by the Pilots.
- **Section 7** will bring up the Pilots' particular conclusions from this periodic assessment.
- **Section 8** will set the particular steps each Pilot will follow towards the final report, related to achieving its particular objective and overcoming of the challenges that have arisen.

Afterwards, the deliverable provides an introduction to the replicators of the project, and a general conclusion and next-steps section of the deliverable, that will provide us with a clear perspective that will be helpful for the *Deliverable 5.4 Pilot Executive Plans Final Report*.

3. Methodology

The KPIs that will be reported and commented on this deliverable are the ones that already appear in *D3.2 Pilot Executive Plans and description of the OIS Hubs*, as well as the KPIs mentioned in *D1.3. Extract of the project data from the LIFE KPI webtool*, making a total of 13 KPIs. The reported KPIs are listed next:

- **SOC01:** Number of energy communities and/or other kind of citizen-led energy initiatives supported.
- **SOC02:** Number of energy communities and/or other kinds of citizen-led energy initiatives launched.
- **SOC03:** Number of local and regional governments staff, officials and other relevant market stakeholders with increased skills due to capacity building activities and tools.
- **SOC08:** Number of legislation, policies or strategies created/adapted at any governance levels.
- **SOC09:** Number of real-life implementation sites carried out by the project.
- **SOC10:** Number of stakeholders reached through media and events during the project.
- **ECO01:** Number of products (goods or services), processes and methods launched into the market by the project.
- **ECO02:** Investments in local sustainable energy triggered by the project.
- **ECO05:** Number of new jobs created.
- **ENV01:** Total Primary Energy Savings triggered by the project.
- **ENV02:** Total Final Energy Savings triggered by the project.
- **ENV03:** Total reduction of Greenhouse gases emissions triggered by the project.
- **ENV04:** Total generation of Renewable Energy triggered by the project.

4. Measure of Pilot Executive Plans' success against objectives

4.1. ANCI LAZIO

4.1.1. State of the Art Update

ANCI Lazio has played a pivotal role in strengthening Renewable Energy Communities (RECs) 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.

Key Events in the last months:

January 31, 2024: During the meeting organized by the Sapienza University, titled “Stakeholders and Practice Observers' Rome Pilot Meeting” within the Sun4All project, the work done by COMANAGE and the opportunities for RECs were presented, including a talk titled “Contrasting Energy Poverty in the Italian Context”, which highlighted the project's contribution to tackling energy poverty in Italy.

February 20, 2024: The training event held at the Lazio Region headquarters was a key opportunity to explore the tools developed by COMANAGE (funded by the LIFE program) for the creation and strengthening of RECs. 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 meeting, engaged several RECs to discuss updates to the COMANAGE Toolkit and reflect on strategies to overcome barriers to REC strengthening. 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.

4.1.2. Social KPIs Report

SOC01: Number of energy communities and/or other kind of citizen-led energy initiatives supported

5

As of October 31, over 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.

SOC02: Number of energy communities and/or other kind of citizen-led energy initiatives launched

2

As of October 31, the launch of two Energy Communities is being actively supported: the REC in Fonte Nuova and the "RSEC Anguillara". Both initiatives are receiving guidance and technical assistance to ensure their successful establishment.

SOC03: Number of local and regional governments staff, officials and other relevant market stakeholders with increased skills due to capacity building activities and tools

452

452 people (342 under the different meetings organised + 110 participants of E-Learning course) so far. This result includes local and regional governments, staff and officials, as well as other market stakeholders, who have benefited from the ongoing activities.

SOC08: Number of legislation, policies or strategies created/adapted at any governance levels

1

The COMANAGE Executive Action Plan was created and presented to the Lazio Region on 20 February 2024.

SOC09: Number of real-life implementation sites carried out by the project

1

1 OIS Hubs correct implemented with 4 in presence meetings organized by ANCI Lazio in Ventotene REC and Lazio region territory.

SOC10: Number of stakeholders reached through media and events during the project

3689

3689 estimated stakeholders reached through media and events organised so far, based on the tacker tool

4.1.3. Economical KPIs Report

ECO01: Number of products (goods or services), processes and methods launched into the market by the project

1

1 Integrated product developed (ECGT - Energy Community Governance Toolkit, comprising e-learning modules and Decision Support System, completed and publicly accessible).

ECO02: Investments in local sustainable energy triggered by the project [€]

N.A.

N.A. More information will be provided on this KPI by the end of the project.

ECO05: Number of new jobs created	1
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1 Hub manager engaged by ANCI Lazio.

4.1.4. Environmental KPIs Report

ENV01: Total Primary Energy Savings triggered by the project [GWh/year]	5.03
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458 members of Energy communities have been actively involved in Lazio region pilot activities. An average of 11 kWh of Primary Energy saving per member has been taken into account.

ENV02: Total Final Energy Savings triggered by the project [GWh/year]	3.2
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458 members of Energy communities have been actively involved in Lazio region pilot activities. An average of 7 kWh of Final Energy saving per member has been taken into account.

ENV03: Total generation of Renewable Energy triggered by the project [GWh/year]	0.5
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339 kW have been installed by the energy communities supported by Anci Lazio pilot activities. An average of 1,500 kWh/kW of PV production has been considered as production coefficient for Lazio region (from PVGIS-EU validated software).

ENV04: Total reduction of Greenhouse gases emissions triggered by the project [TCO ₂ eq/year]	2,666
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Using the datum that each MWh of primary energy generates 0.53 tons of CO₂eq, and the primary energy saving value corresponding to KPI ENV01, the computation of the KPI goes as follows:

$$ENV04 = ENV01 \cdot coef. = 5.03 \left[\frac{GWh}{year} \right] \cdot 0.53 \left[\frac{TCO_2eq}{MWh} \right] \cdot \left[\frac{10^3 MWh}{1 GWh} \right] = 2,665.9 \left[\frac{TCO_2eq}{year} \right]$$

4.1.5. Assessment against objectives

Code	KPI definition	Target ANCI LAZIO	Value at M24 ANCI LAZIO	KPI Assessment
SOC01	Number of energy communities and/or other kinds of citizen-led energy initiatives supported.	1	5	The expected number for the support of RECs has been exceeded with satisfaction and this number is expected to increase over time for the planned training and peer-to-peer online activities. The target set for the creation of new RECs has also almost been reached.
SOC02	Number of energy communities and/or other kinds of citizen-led energy initiatives launched.	1	2	
SOC03	Number of local and regional governments' staff, officials and other relevant market stakeholders with increased skills due to capacity building activities and tools.	1,560*	452	To date, approximately 452 people in Lazio region pilot area have been reached by the training and capacity building activities, equivalent to approximately 29% of the overall target (about the 3 pilot areas). Although approximately 50% of the implementation period is missing, the entire target is expected to be reached thanks to the upcoming scheduled meetings, which will include in-person and online sessions. Furthermore, the collaboration with the Chamber of Commerce of Viterbo and Rieti will help to broaden the impact of the activities, encouraging broader and more widespread participation throughout the Lazio region.
SOC08	Number of legislation, policies or strategies created/adapted at any governance levels.	1	1	The COMANAGE Executive Action Plan was created and presented to the Lazio Region on 20 February 2024
SOC09	Number of real-life implementation sites carried out by the project.	1	1	1 OIS Hubs correctly implemented with 4 in-presence meetings organised by ANCI Lazio in Ventotene REC and Lazio region territory.
SOC10	Number of stakeholders reached through media and events during the project.	15,000*	3,689	3689 estimated stakeholders reached through media and events realised so far (counted by tracking activity excel file).
ECO01	Number of products (goods or services), processes and methods launched into the market by the project.	1	1	1 Integrated product developed (ECGT - Energy Community Governance Toolkit, comprising e-learning modules and Decision Support System, completed and publicly accessible).
ECO02	Investments in local sustainable energy triggered by the project.	17,409,210	N.A.	N.A. More information will be provided in this KPI by the end of the project.
ECO05	Number of new jobs created.	1	1	1 Hub manager engaged by ANCI Lazio

Code	KPI definition	Target ANCI LAZIO	Value at M24 ANCI LAZIO	KPI Assessment
ENV01	Total Primary Energy Savings triggered by the project.	7.39	5.03	Total Primary Energy Savings: 5.03 GWh out of a target of 7.39 GWh, with an average of 11 MWh of primary energy saved per member across 458 participants.
ENV02	Total Final Energy Savings triggered by the project.	4.69	3.2	Total Final Energy Savings: 3.2 GWh out of a target of 4.69 GWh, with an average saving of 7 MWh per member.
ENV03	Total generation of Renewable Energy triggered by the project.	2.33*	0.5	Total Renewable Energy Generation: 0.5 GWh, with 339 kW installed by the energy communities in the Lazio region.
ENV04	Total reduction of Greenhouse gases emissions triggered by the project.	5,658*	2,666	Total Greenhouse Gas Emissions Reduction: 2.666 tons of CO2, based on an assumption of 0.53 tons of CO2 reduction per MWh of energy produced.

**These targets are at project level, as its corresponding KPI does not have specific per-pilot targets.*

Table 1. ANCI LAZIO's assessment of the selected Key Performance Indicators

4.1.6. Obstacles and challenges faced

Over the past few months, ANCI Lazio has faced several challenges, with the main one being related to the management of the digital platform COP (Comanage Open Platform) and the technical tools used, as well as the complexity of the process of engaging Renewable and Solidarity Energy Communities (RSEC).

The major unresolved difficulty concerns the management of the WordPress site. Despite the intention to make the platform accessible and intuitive, the available WordPress interface has proven to be not very user-friendly, causing difficulties for ANCI Lazio members in interacting with the system and producing the desired updates. This has slowed down some of the communication and update activities, limiting the effectiveness of certain tools provided to the RSEC, such as the sharing of training materials and support documents. Despite this, ANCI Lazio's team has continuously worked to improve the platform's usability, although the time required for optimization has been longer than expected.

Another significant ongoing challenge concerns the Decision Support System (DSS). Despite significant efforts, the DSS is still not fully functional, with some features not responding as expected. This difficulty has limited the potential of the tool to support decision-making within the RSEC, preventing full integration of its capabilities into the daily activities of the communities. The system's poor performance and lack of reliability have slowed down the response capacity in supporting the RSEC through the DSS. Additionally, another challenge has been the coordination and management of the numerous awareness-raising and training activities planned by the project. Organizing both in-person and online events, as well as actively involving various stakeholders, required significant organizational effort, especially in terms of resource management and adapting to very diverse local contexts. The diversity of participants and the specific needs of the different RSEC made it difficult to create training content that would meet the needs of all groups while still maintaining a unified vision of the project.

Another issue was managing the expectations of local administrations and RSEC members, particularly regarding the direct benefits of implementing the tools and resources provided by the project. Many administrations showed interest, but the complexity of the regulatory framework and the need to find funding for the necessary investments in renewable energy systems has slowed their ability to effectively implement the replicability of good practices in renewable energy communities.

Despite these challenges, the project has made significant progress thanks to collaboration with partners like AISFOR and numerous awareness-raising activities. Efforts to promote the awareness and adoption of Renewable Energy Communities (REC) have had a positive impact, with increasing participation from both REC and citizens. However, challenges remain in improving the reliability of digital tools, strengthening the adoption of solutions within local administrations, and optimizing the functioning of the DSS to ensure the sustainable and lasting growth of the REC.

4.1.7. Particular conclusions

Although the project has encountered some technical and organizational obstacles, the experiences gained so far have provided valuable lessons to optimize the functioning of RECs, making them more resilient and adaptable to future challenges.

4.1.8. Particular Steps to follow towards Final Report

For the final report, it will be essential to collect and analyse data on the objectives achieved, evaluate the impact of the project on Renewable Energy Communities (RECs), and discuss the challenges encountered, such as the management of the digital platform and the DSS, along with the solutions implemented. It will be important to include feedback from participants and stakeholders, highlight the best practices developed, and make recommendations for the future, such as optimizing digital tools and expanding RECs. The final report should also present the results visually through graphs and tables to enhance communication and understanding.

Additionally, ANCI Lazio plans to develop a collaboration agreement with the Rieti and Viterbo Chambers of Commerce to organize four upcoming events (two in-person training sessions and two online peer-to-peer meetings between Renewable Energy Communities, or REC), aiming to create synergies for sustainable growth. Another agreement with a platform supporting RECs will also be pursued to enhance future sustainability and foster collaboration within the sector. Finally, a plan for the continued support of Renewable Energy Communities beyond the project will be developed, identifying potential funding sources, new partnerships, and strategies for scalability.

4.2. AMB

4.2.1. State of the Art Update

Currently, there are no public-led operational energy communities in the Metropolitan Area of Barcelona. However, this does not imply a lack of interest or potential of spreading. On the contrary, there are around **20 initiatives** in various stages: some of them are under consideration, others in the process of creation, or in the early stages of the project.

However, 5 different 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 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.

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.

First idea of AMB service definition

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.

4.2.2. Social KPIs Report

SOC01: Number of energy communities and/or other kind of citizen-led energy initiatives supported	4
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The AMB has supported from our One-Stop-Shop counselling office in self-consumption PV, *La Teulada*, the following energy community initiatives:

- 1 CEL La Bastida (Cornellà del Llobregat),
- 1 CEL Floresta (Sant Cugat del Vallés),
- 2 shared-self consumptions in Sant Cugat del Vallés.

SOC02: Number of energy communities and/or other kind of citizen-led energy initiatives launched	5
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Regarding the number of launched initiatives, 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.

SOC03: Number of local and regional governments staff, officials and other relevant market stakeholders with increased skills due to capacity building activities and tools	45
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This result arises from the attendance lists of the activities developed by the project up to October 2024 (M24). When the E-Learning training platform is launched, together with further activities that will be developed, this KPI value is projected to increase substantially in the following months.

SOC08: Number of legislation, policies or strategies created/adapted at any governance levels	2
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There are two pieces of legislation, policies or strategies that have been created concerning the AMB Pilot:

- The Pilot Executive Plan
- A draft of the Royal Decree regarding the development of the figures regarding RECs, at which AMB has presented allegations.

SOC09: Number of real-life implementation sites carried out by the project	2
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The two shared-self consumption sites explained above, both located in the municipality of Sant Cugat del Vallés, constitute the real-life implementation sites carried out to this date by the project.

SOC10: Number of stakeholders reached through media and events during the project	1,216
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This result is computed summing the number of visits to the website, the number of followers in LinkedIn, the number of followers in X (Twitter), and the result of the KPI *SOC03* up to October 2024 (M24). This last value is also included here as these staff, officials and stakeholders reached through the activities and tools can also be included in this KPI.

4.2.3. Economical KPIs Report

ECO01: Number of products (goods or services), processes and methods launched into the market by the project	2
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If computed the sum of the three OIS Hubs and the three Tools created during the project, the total number of products, processes and methods launched for the three Pilots turns out to be six, or two per Pilot. As a result, the AMB reports that 2 products, processes and methods were launched into the market by the project: the creation of the OIS Hub plus the developed integrated product: the ECGT, including the E-Learning platform and the DSS.

ECO02: Investments in local sustainable energy triggered by the project [€]	5,849,280 €
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The total investment in local sustainable energy triggered by the project is computed calculated obtaining 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). The datum extracted will be also applied for computing the KPI *ENV02*. It is estimated that 2% of the total energy saved corresponds to the project's actions. The AMB estimates that 2.924,64 kWp were installed in the region, which by

considering that installing 1kWp of power costs 2.000 €, the computation corresponds to a total of 5,849,280 € were invested in local sustainable projects in the AMB.

ECO05: Number of new jobs created	1
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At our OIS HUB, 1 Full-Time Employee (FTE) has been contracted dedicated exclusively to the project.

4.2.4. Environmental KPIs Report

ENV01: Total Primary Energy Savings triggered by the project [GWh/year]	3.99
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The total primary energy savings triggered by the project is computed multiplying the Primary Energy Factor times the total final energy savings triggered by the project (KPI *ENV02*). This Primary Energy Factor (PEF) is defined as the quantity of primary energy units needed to generate and deliver one unit of energy (electricity) to the end users. For this computation, the PEF is estimated to be equal to 2.1. Estimating that the final energy savings are 3.8 GWh/year, the AMB reports that the total primary energy savings are 7.98 GWh/year.

ENV02: Total Final Energy Savings triggered by the project [GWh/year]	1.9
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The total final energy savings triggered by the project in the AMB are calculated obtaining 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). It is estimated that 2% of the total energy saved corresponds to the project's actions.

ENV03: Total generation of Renewable Energy triggered by the project [GWh/year]	1.9
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As the project is not meeting with the scope on energy efficiency, the KPI on total generation of renewable energy triggered by the project corresponds to the value of the KPI *ENV02 Total Final Energy Savings triggered by the project*.

ENV04: Total reduction of Greenhouse gases emissions triggered by the project [TCO ₂ eq/year]	1,038
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The coefficient that relates the primary energy savings and the GHG emissions savings triggered by the project is collected from the CNMC (Spanish Nacional Commission of Markets and Competition) computation of 2023. It is the most reliable metric available as it is updated every year, and it uses data based on the Spanish energy mix. This coefficient for 2023 is 260 tons of equivalent CO₂ per GWh of primary energy. The computation for calculating this KPI goes as follows:

$$ENV04 = ENV01 \cdot coef. = 3.99 \left[\frac{GWh}{year} \right] \cdot 260 \left[\frac{gCO_2eq}{kWh} \right] \cdot \left[\frac{10^6 kWh \cdot 1 TCO_2}{1 GWh \cdot 10^6 gCO_2eq} \right] = 1,038 \left[\frac{TCO_2eq}{year} \right]$$

4.2.5. Assessment against objectives

Code	KPI definition	Target AMB	Value at M24 AMB	KPI Assessment
SOC01	Number of energy communities and/or other kinds of citizen-led energy initiatives supported.	1	4	Both targets related to supporting and launching energy communities are fulfilled because of the favourable legislation and the implication of the AMB through the existing OSS counselling office, <i>La Teulada</i> . These KPIs are related to our objectives of strengthening stakeholder collaboration and encouraging citizen involvement.
SOC02	Number of energy communities and/or other kinds of citizen-led energy initiatives launched.	1	5	
SOC03	Number of local and regional governments' staff, officials and other relevant market stakeholders with increased skills due to capacity building activities and tools.	1560*	45	The target has still not been met because the E-Learning platform has still not been launched. The AMB is convinced that when it is launched, more stakeholders will gain skills through it, which is one of our specific goals to be achieved.
SOC08	Number of legislation, policies or strategies created/adapted at any governance levels.	1	2	The elaboration of our Executive Plan, together with the involvement of the statal institutions to develop favourable legislation regarding energy communities has contributed to the achievement of the target of this KPI.
SOC09	Number of real-life implementation sites carried out by the project.	1	2	The implementation of the project is done on two real-life sites.
SOC10	Number of stakeholders reached through media and events during the project.	15,000*	1,216	This KPI is not met at this moment, but it is believed that, as the COMANAGE tools are finished and launched; the project will reach more stakeholders and gain more popularity and contribute to raising awareness about the project and its benefits.
ECO01	Number of products (goods or services), processes and methods launched into the market by the project.	1	2	Having developed these tools (the OIS Hub and the ECG Tools) will contribute to skill enhancement, having a comprehensive repository of documents available, raising awareness and encouraging active involvement of stakeholders.
ECO02	Investments in local sustainable energy triggered by the project.	9,418,496	5,849,280	The investment figures that managed at the moment do not meet the target but considering that investments in local sustainable energy in AMB are increasing greatly, the project will be able to trigger more investment in the following months. An important fact to remark is that our pilot's actions are mainly focused on solar panel installations, an option of generating renewable energy that is very competitive and has a fast return on the investment, together with the high amount of Sun hours in southern Europe.

Code	KPI definition	Target AMB	Value at M24 AMB	KPI Assessment
ECO05	Number of new jobs created.	1	1	The target of creating one FTE has been achieved successfully.
ENV01	Total Primary Energy Savings triggered by the project.	3.16	3.99	Regarding the KPIs related with energy generation and savings, 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.
ENV02	Total Final Energy Savings triggered by the project.	1.68	1.9	
ENV03	Total generation of Renewable Energy triggered by the project.	2.33*	1.9	
ENV04	Total reduction of Greenhouse gases emissions triggered by the project.	5,658*	1,038	Taking the Spanish coefficient for emissions regarding primary energy production, the reduction of GHG in the AMB surpasses the thousand tonnes of reduction of emissions, contributing greatly to the achievement of the project level target.

**These targets are at project level, as its corresponding KPI does not have specific per-pilot targets.*

Table 2. AMB's assessment of the selected Key Performance Indicators

4.2.6. Obstacles and challenges faced

One of the primary challenges faced by AMB is the difficulty in achieving consensus among residents within the same neighbourhoods to initiate Renewable Energy Communities (RECs). In Catalonia, there is a limited cultural tradition of addressing such issues collectively. This lack of a collaborative approach is compounded by a general lack of awareness: many citizens do not yet recognize the urgency of making the energy transition a priority.

Another significant obstacle encountered by AMB is the difficulty in gathering accurate data regarding the energy performance and financial investments of RECs. Due to this limitation, AMB has often been forced to rely on estimations for these metrics, which may affect the precision and reliability of their analyses and plans.

Additionally, the implementation of some tools developed as part of the project framework has been delayed. This has hindered the overall impact of the initiative, despite the fact that AMB operates in a region with excellent climatic potential for establishing RECs. These delays have also slowed down the dissemination efforts, as certain tools necessary for broader communication and engagement are not yet operational.

It is also worth noting the economic disparity between investments in photovoltaic energy and in building or housing rehabilitation. Photovoltaic energy is generally a far more attractive investment, as its Return On Investment (ROI) typically occurs within just a few years. In contrast, the ROI for rehabilitation investments often spans decades, making such projects less economically appealing. Furthermore, collecting data related to rehabilitation investments is considerably more challenging compared to obtaining information about the photovoltaic industry.

4.2.7. Particular conclusions

The AMB's interpretation of the periodic monitoring results is generally very positive. Despite encountering various obstacles and challenges along the way, most of the key performance indicators (KPIs) have already reached or exceeded their target values. This progress underscores the effectiveness of the efforts undertaken so far.

For the remaining KPIs that have yet to be achieved, the AMB remains optimistic. As the remaining work progresses, AMB is confident that these outstanding targets will be met. This includes achieving higher levels of investment, fostering greater social engagement, and involving a broader range of stakeholders in the initiative.

A notable conclusion drawn from the monitoring process is the difference in outcomes related to economic and energy performance. While the AMB has fallen short of our economic investment targets, the results in terms of energy production and emissions reductions have been exceptional. This discrepancy is largely attributed to the emphasis on photovoltaic energy projects, which, as previously highlighted, are highly competitive investments. These projects offer significant returns in a relatively short time frame, making them particularly advantageous for achieving energy and environmental goals.

4.2.8. Particular Steps to follow towards Final Report

The particular steps to follow on the part of AMB's Pilot are listed below:

- January 2025 – Improvements will be carried out on both the DSS and the COP, so that they can be launched before winter ends.
- February 2025 – Completion and launch of the E-Learning platform.
- April 2025 – OIS HUB Meeting, where all the tools will be presented to the stakeholders.

Another important action to remark is to continue to increase citizen engagement, which is critical to the success of your project, as it fosters a sense of ownership, builds trust, and enhances social acceptance of initiatives like RECs. By involving citizens in decision-making, the project increases awareness of the urgency of energy transition and boosts participation and investment.

4.3. KMA

4.3.1. State of the Art Update

In Poland, 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 persons. 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.

1. The **Niepołomice Energy Community** is a wholly municipal energy cooperative, consisting of: Niepołomice Municipality, Infrastruktura Niepołomice sp. Z o.o. and the Cultural Centre in Niepołomice. The cooperative's power supply installations are located on members' buildings, which are public buildings. The reason for setting up the cooperative is the desire to reduce costs (partial exemption from fees for the cooperative), which will allow funds to be raised for the further development of RES in the Niepołomice municipality. The cooperative has completed registration with the relevant authorities.
2. The **Skawina Energy Community** is another cooperative made up entirely of municipal entities: Skawina Municipality, the Skawina Regional Museum, and the Skawina Municipal Public Library. It is in the early stages of registration. As

with the energy community in Niepołomice, the reason for setting it up is to be able to obtain better energy prices for public buildings.

3. The **Energy Community "Green Wieliczka"** is a cooperative founded by three local entrepreneurs, the reason for the establishment of the cooperative is the surplus production from RES on the premises of the enterprises. Currently, the surpluses are fed back into the grid with an unfavourable settlement for the producers. The creation of the cooperative results in the possibility of balancing the production and benefiting from fee exemption. The cooperative is in the final stages of registration and plans to seek new members.
4. Finally, the **Energy Cluster "Korona Północnego Krakowa"** consists of four municipalities bordering the city of Kraków to the north – municipality of Zielonki, municipality of Kocmyrzów - Luborzyca, municipality of Igołomia-Wawarzędz and municipality of Wielka Wieś. The cluster is a form of inter-municipal cooperation and serves as an aid to obtain financing for RES investments.

The Polish Hubs meetings have brought to light some key aspects:

- Hub participants have shown a strong interest in the topic of energy communities, mainly **energy cooperatives**. This is directly linked to the high electricity prices affecting local authorities. As a result, municipalities are looking for ways to reduce their energy bills, but also to invest in renewable energy sources to increase their energy self-sufficiency.
- **Energy poverty** is also an important issue that municipalities are facing. Local authorities see energy communities as a way to achieve goals as reduction of energy costs, energy self-reliance, and reduction of energy poverty; currently energy cooperatives in Poland are exempt from numerous charges which bring direct profit to their members.
- However, **energy communities are still something new in Poland**, so there is a lot of uncertainty among local governments. This is due to the lack of knowledge of the topic among civil servants, but also to the lack of simple and available solutions that local governments could directly use.

The presence of three energy cooperatives among the members of OIS Hub is a very good opportunity to create a **platform for knowledge exchange and cooperation** between local governments.

It is also worth mentioning that OIS Hub participants include representatives of the city of **Krakow**, one of the largest cities in Poland and the only **urban commune** among the participants. Unfortunately, the current law does not allow the establishment of energy cooperatives in cities, as it is limited only to urban-rural and rural areas. Another form of community that the city of Krakow is also planning to implement is the **collective prosumer**⁷, so it is important to take into account the needs of all OIS Hub participants as the tools will be provided to all municipalities involved.

First idea of the service definition

As highlighted above, KMA considers fundamental, for a solid service definition, the following aspects:

1. Providing the necessary **knowledge** about energy communities, especially energy cooperatives, to participants.
2. Providing **expert support** to all OIS Hub participants.
3. Promoting and sharing **the COMANAGE products** (Toolkit, DSS, E-Learning, Open Platform, Digital Hub), thus filling the knowledge gap among participants.

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. During those meetings, KMA and the municipalities worked together on developing the ECGT, adapted to Polish conditions. Additionally, in 2024, KMA subcontracted an expert who provided the necessary technical knowledge about the energy sector and created a billing model for the EC.

4.3.2. Social KPIs Report

SOC01: Number of energy communities and/or other kind of citizen-led energy initiatives supported	3
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One of our OIS Hub meetings between September and December 2023 there were three energy cooperative present.

SOC02: Number of energy communities and/or other kind of citizen-led energy initiatives launched	2
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In KMA two municipal based EC were launched after January 2023 - It was asked for some kind of letter of acknowledgement of COMANAGE project influence.

SOC03: Number of local and regional governments staff, officials and other relevant market stakeholders with increased skills due to capacity building activities and tools	53
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OIS HUBS - from September 2023 to end of 2024 there was 53 different persons at OIS HUBS.

SOC08: Number of legislation, policies or strategies created/adapted at any governance levels	2
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1 - Pilot executive plan, and 2 - Action Plan for Energy Efficiency Growth and Air Quality Improvement in the Krakow Metropolitan Area 2024-2030 (in this document tasks regarding energy communities were included).

SOC09: Number of real-life implementation sites carried out by the project	1
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1 OIS Hubs.

SOC10: Number of stakeholders reached through media and events during the project	N.A.
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16 posts on LinkedIn page from December 2023. [KMA page](#). More information will be provided in this KPI by the end of the project.

4.3.3 Economical KPIs Report

ECO01: Number of products (goods or services), processes and methods launched into the market by the project	1
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ECGT in Polish version.

ECO02: Investments in local sustainable energy triggered by the project [€]

5,634,777 €

The total investment in local sustainable energy triggered by the project is computed taking the estimation of the total power installed and refurbishment triggered by the project. Also, the municipalities in KMA are actively benefit from the European funds allocated to the region for improving energy efficiency and creating RES, for this calculation the allocation of the fund for two of municipalities (Skawina and Niepolomice) where exists active energy communities is chosen.

ECO05: Number of new jobs created

N.A.

N.A. More information will be provided in this KPI by the end of the project.

4.3.3. Environmental KPIs Report

ENV01: Total Primary Energy Savings triggered by the project [GWh/year]

5,1

The total primary energy savings triggered by the project is computed multiplying the Primary Energy Factor times the total final energy savings triggered by the project (KPI *ENV02*). This Primary Energy Factor (PEF) is defined as the quantity of primary energy units needed to generate and deliver one unit of energy (electricity) to the end users. For this computation, the PEF is estimated to be equal to 3.0.

ENV02: Total Final Energy Savings triggered by the project [GWh/year]

1,7

The total final energy savings triggered by the project in the KMA are calculated obtaining the recently installed PV and refurbishment of the households in the Małopolska Voivodeship in 2023 from the Energy Regulatory Office (PV installations) – which is a central body of state administration responsible for regulation in energy sector and Marshal's Office of the Małopolska Region (refurbishment). It is estimated that 1% of the total energy saved corresponds to the project's actions.

ENV03: Total generation of Renewable Energy triggered by the project [GWh/year]

1,035

As the project is not meeting with the scope on energy efficiency, the KPI on total generation of renewable energy triggered by the project corresponds to production of energy from PV installation part of to the value of the KPI *ENV02 Total Final Energy Savings triggered by the project*.

ENV04: Total reduction of Greenhouse gases emissions triggered by the project [TCO₂eq/year]

708,9

The coefficient that relates the primary energy savings and the GHG emissions savings triggered by the project is collected from the the National Centre for Emissions Management (KOBIZE) computation of 2023. It is the most reliable metric available as it

is updated every year, and it uses data based on the Polish energy mix. This coefficient for 2023 is 0,685 tons of equivalent CO₂ per MWh of primary energy. Using this information, the KPI is computed as follows:

$$ENV04 = ENV01 \cdot coef. = 5.1 \left[\frac{GWh}{year} \right] \cdot 0.685 \left[\frac{TCO_2eq}{MWh} \right] \cdot \left[\frac{10^3 MWh}{1GWh} \right] = 3,493.5 \left[\frac{TCO_2eq}{year} \right]$$

4.3.4. Assessment against objectives

Code	KPI definition	Target KMA	Value at M24 KMA	Assessment
SOC01	Number of energy communities and/or other kinds of citizen-led energy initiatives supported.	1	3	One of our OIS Hub meetings between September and December 2023 there were three energy cooperative present - an attendance list can be provided.
SOC02	Number of energy communities and/or other kinds of citizen-led energy initiatives launched.	1	2	In KMA two municipal based EC were launched after January 2023 - It was asked for some kind letter of acknowledgement of COMANAGE project influence if needed (I do not have 100% guarantee that they will provide us with those).
SOC03	Number of local and regional governments' staff, officials and other relevant market stakeholders with increased skills due to capacity building activities and tools.	1,560*	-	53 participants to the OIS HUB meetings.
SOC08	Number of legislation, policies or strategies created/adapted at any governance levels.	1	2	1 - pilot executive plan, and 2 - Action Plan for Energy Efficiency Growth and Air Quality Improvement in the Krakow Metropolitan Area 2024-2030 (in this document tasks regarding energy communities were included).
SOC09	Number of real-life implementation sites carried out by the project.	1	1	1 OIS Hubs
SOC10	Number of stakeholders reached through media and events during the project.	15,000*	N.A.	N.A. More information will be provided in this KPI by the end of the project.
ECO01	Number of products (goods or services), processes and methods launched into the market by the project.	1	1	ECGT in Polish version.
ECO02	Investments in local sustainable energy triggered by the project.	16,177,778	5,634,777	The total investment in local sustainable energy triggered by the project is computed taking the estimation of the total power installed and refurbishment triggered by the project.
ECO05	Number of new jobs created.	1	N.A.	N.A. More information will be provided in this KPI by the end of the project.

Code	KPI definition	Target KMA	Value at M24 KMA	Assessment
ENV01	Total Primary Energy Savings triggered by the project.	4.93	5.1	The total primary energy savings triggered by the project is computed multiplying the Primary Energy Factor times the total final energy savings triggered by the project (KPI ENV02).
ENV02	Total Final Energy Savings triggered by the project.	3.92	1.7	It is estimated that 1% of the total energy saved corresponds to the project's actions.
ENV03	Total generation of Renewable Energy triggered by the project.	2.33*	1.04	It corresponds to production of energy from PV installation part of to the value of the KPI ENV02 <i>Total Final Energy Savings triggered by the project</i> .
ENV04	Total reduction of Greenhouse gases emissions triggered by the project.	5,658*	3,494	The coefficient that relates the primary energy savings and the GHG emissions savings triggered by the project is collected from the he National Centre for Emissions Management (KOBIZE) computation of 2023.

**These targets are at project level, as its corresponding KPI does not have specific per-pilot targets.*

Table 3. KMA's assessment of the selected Key Performance Indicators

4.3.5. Obstacles and challenges faced

The lack of decisions to establish Energy Communities (ECs) in municipalities stems from the fact that only mayors hold the authority to initiate their creation. Municipal employees, despite their involvement in local governance, do not have the legal power to make such decisions independently. This creates a significant bottleneck, as the establishment of ECs depends entirely on the willingness and initiative of the municipal leadership.

Another critical issue is the not enough of national support and subsidies for Energy Communities in Poland. The lack of enough dedicated financial incentives and funding mechanisms makes it difficult for municipalities and citizens to bear the initial costs associated with setting up and operating ECs. This financial gap significantly hinders the widespread adoption and development of ECs across the country.

Technical and legal barriers present further challenges for the establishment and functioning of Energy Communities in Poland. Current regulations are either unclear or restrictive, creating obstacles in areas such as grid access, shared energy management, and administrative processes. These legal complexities deter municipalities and potential participants from engaging in EC initiatives.

Moreover, there is a significant lack of knowledge and awareness about Energy Communities among the general population. Many citizens are unaware of the concept, its benefits, and the opportunities it presents for local energy independence and sustainability. This knowledge gap results in low public interest and limited grassroots support, which are essential for the successful implementation of ECs.

4.3.6. Particular conclusions

Energy Communities (ECs) are gaining momentum within the Kraków Metropolitan Area (KMA), and their potential for growth in the near future is significant. However, for this positive trend to continue and for more ECs to be successfully established, targeted promotional efforts are essential.

Raising awareness and understanding of the concept among key stakeholders—mayors, municipal employees, and citizens—is crucial. Mayors must be informed about the benefits and strategic importance of ECs, including their potential to enhance energy independence, reduce emissions, and lower energy costs for local communities. Municipal employees need to be equipped with the knowledge and tools necessary to support the technical and administrative processes involved in creating and managing ECs.

Equally important is engaging citizens, who are ultimately the beneficiaries and participants of Energy Communities. Educating the public about the advantages of ECs, such as local control over energy resources, cost savings, and environmental benefits, will help build grassroots support and encourage active involvement.

4.3.7. Particular Steps to follow towards Final Report

Promoting the tools developed within the project is essential to advancing the establishment of Energy Communities (ECs) in the Kraków Metropolitan Area (KMA). To ensure these tools are effectively utilized, engaging an expert to create tailored models of ECs specifically designed for the unique needs and capacities of KMA municipalities is a critical step. These customized models will provide practical blueprints for municipalities to follow, streamlining the process of EC formation and implementation.

Sharing good practices among key stakeholders, particularly mayors, is another crucial component. As the primary decision-makers with the authority to initiate EC projects, mayors play a pivotal role in driving the development of ECs. Providing them with access to successful case studies and proven strategies will empower them to take informed and confident actions in their municipalities.

Equally important is disseminating information to citizens through municipal channels. Raising public awareness and understanding of ECs will foster community support and encourage active participation. This can be achieved by leveraging municipalities as trusted intermediaries to communicate the benefits and opportunities associated with ECs directly to local residents.

A coordinated approach that combines the promotion of project tools, expert guidance, sharing of good practices, and targeted outreach to citizens will significantly enhance the adoption and success of Energy Communities in the KMA.

5. Replicators' inputs and introduction

A key aspect of the project's Sustainability, Replication, and Expansion plan involves establishing a sustainable Replicators Board, a kind to a community of practitioners. This board aims to maximize and ensure the project's impact while assisting in validating the pilot model developed by the project.

Replication efforts are planned through two complementary approaches. Firstly, they will be facilitated through the three pilot Operative Integrated Services (OIS) Hubs by creating physical and virtual spaces for dialogue and collaboration with local stakeholders using a participatory approach. This has resulted in establishing so far, a collaborative ecosystem within both the Lazio Region Municipalities (thanks to the support of ANCI Lazio) and the Community Transformation Offices network in the Metropolitan Barcelona Area. Krakow metropolitan area is also developing a strategy.

Secondly, Metropolis and Co-opAbility have devised a strategy for identifying potential members and forming a Board of Replicators. These individuals come from the initial candidates who provided letters of support during the project submission phase. Additional candidates have been included based on previous meetings and email exchanges. The Board comprises seven interested local authorities committed to becoming project replicators, including **Rome Capital City** (Italy), **Energy Agency Kssena** from Slovenia, **Dakar** (Senegal), **Warsaw Capital** (Poland), **Diputació de Girona** (Spain), **Madrid Capital** (Spain), and **Cordoba metropolitan area** (Argentina). Furthermore, **Canton de Génève** (Switzerland) and **Grand Métropole de Paris** (France) are members of the board of replicators. Eventually, the city of **Johannesbourg** has also joined the board coming up with an energy community in unserved and vulnerable urban areas.

The selection of replicators is based on the size of their territories and their interest in enhancing their replication capabilities using the project's results. An inaugural online meeting last June, focused on peer-to-peer coaching, featuring introductions and the sharing of expectations from the replicators, insights from the pilot Hubs, and an overview of the program and its developed products/outcomes. As a result of this meeting, an action plan with replicators for scheduling online exchanges and the final replication workshop. Throughout the project lifecycle, replicators were agreed. Members registered on the project's open platform and engaged in future online forums and the e-learning platform. This platform will remain accessible to them even after the project concludes.

In line with the Board's objectives, a Roadmap for the replication strategy and knowledge transfer methodology has been devised to engage participants in mutual peer-to-peer learning exchanges, culminating in the final replication workshop at the project's M30 milestone, in April 2025.

Two other online peer-to-peer knowledge exchange sessions have been delivered last September and December 2024. In each session, a bunch of replicators showcased their best practices and received feedback from the rest of participants. Two pilot hubs from AMB and Anci Lazio were also presented and an Energy Community facilitator who has been supported by AMB has also been part of the session. In addition, a thematic unit focused on Energy Poverty concepts and Greek experience with a

national network of energy communities was also shared. Finally, the E-learning platform tool was introduced and through online survey feedback from replicators will be collected with the objective of improving the tool and fine tuning it adapted to their own contexts.

Two additional online meetings are foreseen next year 2025 where new bunch of replicators will share their experiences and the rest of the Comanage developed tools available at the open platform will be presented such as the governance tool kit or the DSS. A final replication workshop in June will be also performed to consolidate the learnings from the whole exchange process and ensure the sustainability of the board.

6. General Conclusions and next steps to be followed towards Final Report

The main line of action for all pilots within the COMANAGE framework involves launching and promoting the developed tools to support the creation and management of Energy Communities (ECs). Despite the diverse realities each pilot faces, these tools play a crucial role in empowering citizens and stakeholders to overcome technical, financial, legal, and social barriers associated with ECs. This empowerment fosters greater participation and enhances the overall resilience and sustainability of the energy communities.

A vital aspect of the project is the dissemination of information and knowledge, which drives awareness, understanding, and involvement in EC initiatives. Ensuring that relevant, accessible information reaches citizens is essential for conveying the goals, benefits, and operational insights of energy communities. The dissemination efforts align closely with project reporting activities, reflecting the importance of sharing results, key performance indicators, and best practices gathered throughout the project lifecycle.

When comparing the social and political landscape each pilot faces, it becomes evident that resources, knowledge, awareness, and stakeholder engagement levels vary significantly. These inequalities highlight the different starting points for groups of citizens seeking to establish an energy community, depending on their region. In some areas, forming and managing an EC is more straightforward, while in others, geographical barriers hinder progress. Sharing knowledge and tools, and fostering collaboration is essential to ensure an inclusive energy transition that leaves no one behind.

A recurring conclusion from periodic monitoring reports is the challenge pilots face in launching citizen-led home rehabilitation initiatives. While such actions yield substantial energy savings and greenhouse gas reductions, they require significant financial investment, have long execution timelines, and offer low returns on investment. This presents both economic and social barriers, as insufficient government funding and public disinterest—stemming from the project's scale and slow payback period—hamper critical improvements to inefficient residential units.

Additionally, a general lack of citizen engagement has been observed across all pilots. Although public awareness of renewable energy's importance is growing, many citizens feel excluded from the process, perceive energy initiatives as distant, and lack platforms for participation or a sense of shared responsibility. Energy consumption remains an individualized service, limiting collective action. Enhanced promotional campaigns, stakeholder collaboration, and societal empowerment are vital to foster EC development.

The COMANAGE project has made notable progress in strengthening Renewable Energy Communities (RECs) through participatory approaches that increase stakeholder awareness and collaboration. Despite challenges managing the WordPress platform and DSS functionality, the project has significantly improved engagement from local authorities and community members. Training activities and key events have driven knowledge sharing and capacity building, supporting REC

implementation and growth. Moving forward, enhancing digital tools and integrating RECs into local and regional energy systems will be critical for ensuring their long-term sustainability and impact. The project's achievements lay a solid foundation for future initiatives, showcasing the potential for RECs to alleviate energy poverty and advance sustainable energy practices.

The next steps towards finalizing the COMANAGE project report focus on consolidating data and results from all pilot activities. This includes thorough documentation and analysis of performance indicators, deliverables, and the evaluation of tools such as the WordPress platform and the Decision Support System (DSS). Stakeholder feedback plays a central role in assessing the effectiveness of these tools, highlighting successes and identifying areas for improvement. Financial and resource reports will also be finalized, ensuring expenditures and resource allocations align with the project budget.

As part of ongoing replication efforts, collaboration and knowledge exchange remain key priorities. In 2025, two online peer-to-peer sessions will provide new replicators with opportunities to share experiences, receive feedback, and engage with tools like the governance toolkit and DSS. Insights from these sessions, coupled with an online survey, will refine the e-learning platform and other resources to better meet replicators' needs. These efforts will culminate in a final replication workshop in June 2025, reinforcing learnings and ensuring robust knowledge transfer across the Replicators Board.

The drafting of the final report will synthesize key learnings, best practices, and lessons, with a special focus on community engagement, local authority involvement, and capacity building. The final phase will involve gathering one last round of stakeholder feedback to ensure comprehensive representation of diverse perspectives. After completing the draft, it will be shared with partners and stakeholders for validation. Once feedback is integrated, the finalized report will be prepared for submission to the relevant authorities and stakeholders, marking the culmination of the COMANAGE project and paving the way for future replication and scaling.