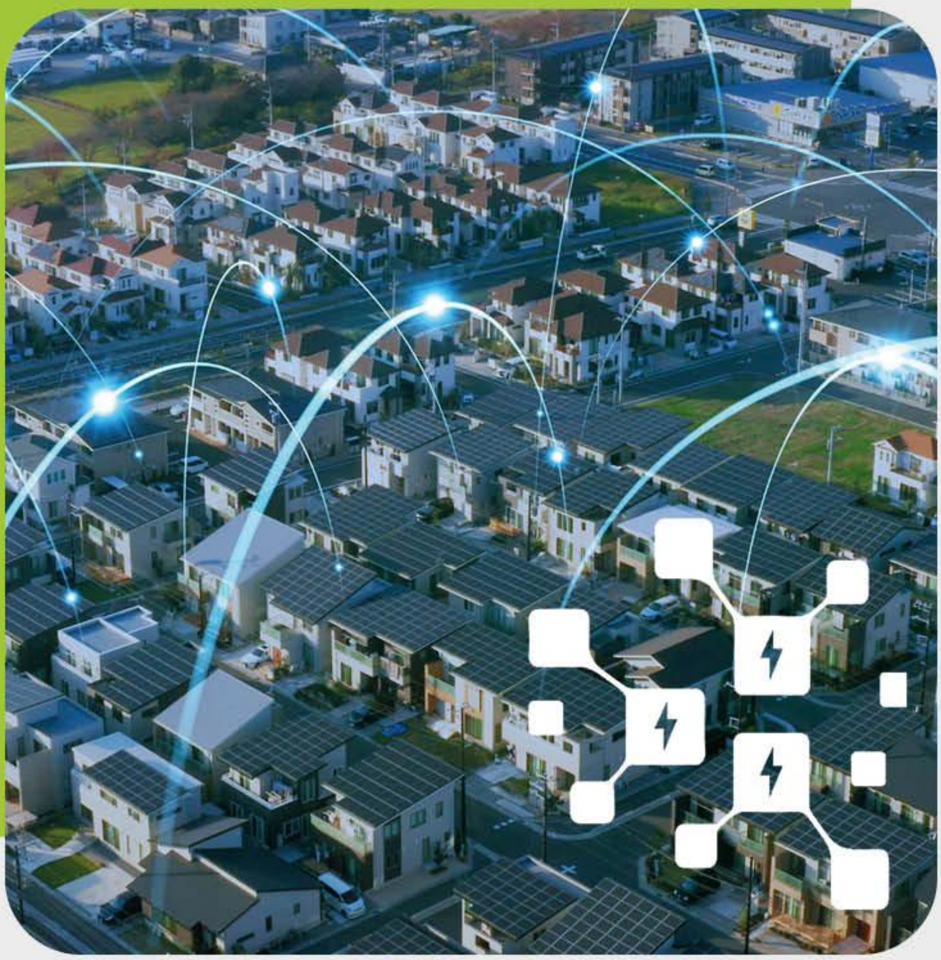
D.3.5 Requirements for new/advanced services



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List of Abbreviation and Acronym

Abbreviation	Meaning
CEP	Community Energy Projects
PV	Photovoltaic
EC	Energy Community
REC	Renewable Energy Community
CEC	Citizen Energy Community
OSS	One-Stop-Shop
CSC	Collective Self Consumption
DSO	Distribution System Operator
KPI	Key Performance Indicator
NRPP	National Recovery and Resilience Plan
ARERA	Italian Regulatory Authority for Energy, Networks and Environment
CACER	Self-consumption configurations for renewable energy sharing
GSE	Italian Energy Services Manager
RENAEL	Italian Network of Local Energy Agencies
ENEA	Italian National Agency for New Technologies, Energy and Sustainable Economic Development
MASE	Italian Ministry of the Environment and Energy Security
CECB	Chamber of Energy Communities in Bulgaria
SEDA	Sustainable Energy Development Agency

1 Introduction: DISCOVER Project

1.1 Overview

DISCOVER is an innovative LIFE project with the strategic aim to support the transition to a renewable energy-driven society. By fostering Community Energy Projects (CEPs), DISCOVER will empower stakeholders and citizens and mobilize significant investments in renewable energy generation in pilot regions across Europe. DISCOVER will catalyse the launch of CEPs in 5 diverse European regions respectively in Austria, Bulgaria, Croatia, France and Italy. Local hubs will be set up to pilot innovative support mechanisms for CEPs. The hubs will deliver guidance and practical services on the technical, economic, financial and legal aspects and will help connecting CEPs to local service and technology providers. The services will cover all developmental stages of CEPs, accompanying them throughout their entire lifecycle.

Taking into account the diverse socio-geographical-legislative and market maturity levels across these 5 pilot regions, DISCOVER will follow a regionally specific approach with four local service hubs. On top of that, an interactive online tool will be designed to provide extensive support to local communities embarking on Renewable Energy Projects.

DISCOVER aims to simplify decision-making processes and reduce operational barriers by connecting projects with local service/technology providers and relevant authorities.

During the 3-year timeframe (2023 – 2026), DISCOVER is expected to reach more than 20,000 citizens, support 20 new initiatives (focusing on community PV installation), and trigger a total investment of more than 7.7 million of euros. The project will promote and facilitate the recreation of future service hubs in other regions to ensure replication across other European regions.

The DISCOVER consortium stands as a collaborative force spanning over five European countries, each committed to driving the vision of CEPs within their respective region. The consortium comprises active national / regional leaders in the CEP initiatives, well-connected to citizens, local authorities, and stakeholders.

1.2 Work package 3 activities

Work Package 3 centers on developing a specific guidebook based on the insights gained from WP2, particularly regarding existing support initiatives, services, schemes, and the general guidebook. The specific guidebooks will be utilized by the service hubs in each pilot region and structure all DISCOVER support services.

This work package initiates DISCOVER’s stakeholder engagement activities (T3.1), guided by the stakeholder engagement strategy document (D3.1), which provides a tailored methodology for engaging each actor. Although stakeholder engagement extends across multiple work packages, WP3's initial efforts are dedicated to identifying and connecting with local stakeholders in each DISCOVER pilot region to understand the practical challenges they encounter in launching CEPs (D3.2).

Understanding these challenges is essential to effectively develop the DISCOVER support services portfolio, which aims to match such challenges with existing services. Where gaps are found, new or advanced services will be developed.

The creation of the specific guidebook for each pilot region (D3.4) involves aligning suitable services with the individual steps of the CEP lifecycle as called out in the general guidebook. Connecting a service to a specific step requires clear structuring. Services should be self-contained and encapsulated to integrate seamlessly into the guidebook. Each service must have clearly defined requirements that outline its purpose. To successfully connect the service to a step, it's also essential to specify the service's interface. This process includes defining the interconnections between stakeholders and the flow of information between them (D3.3), which also supports the initial development of new services by outlining their requirements (D3.5).

2 New and advanced services

The DISCOVER team is committed to developing at least four new or advanced services, one for each of the pilot regions: Italy, France, Bulgaria, and Croatia. These services will be developed as part of Work Package 4, specifically Task 4.2, titled "Advanced Service Development & Testing." The development process is scheduled to take place over a duration of 9 months and will be accompanied by continuous stakeholder workshops. These **workshops** are designed to involve stakeholders from each region throughout the development process, ensuring that the services are tailored to the unique needs and challenges of each local context.

This document serves as the **requirements sheet** for new and advanced services. As such, it outlines the development process for these services over the upcoming months, specifying the expected outcomes, partners involved, the addressed problem, the proposed solution, and detailing the key attributes of the services to be developed.

Within the context of the DISCOVER project, a **new service** refers to a service that is built from scratch, involving the creation of a completely new offering designed to address specific regional needs or gaps. In contrast, an **advanced service** is understood as a significant modification or enhancement of an existing service. This could include refining features, integrating additional functionalities, or adapting the service to better suit local conditions or regulatory requirements.

2.1 Methodology for service selection

The DISCOVER team utilized a dual-criteria approach to rank the services that would be prioritized for development, focusing on two key factors: value and cost. The value of each service was assessed based on its potential impact, benefits, and alignment with project goals, while cost was determined by the resources, time, and effort required for implementation. By evaluating these two dimensions, the team was able to identify which services to select as the four new/advanced DISCOVER services.

2.1.1 Value of service

Within DISCOVER, the value of a service is understood as its potential to catalyze Community Energy Projects (CEPs). High-value services are those that are expected to unlock a large number of CEPs by directly addressing critical pain points and overcoming key barriers faced by CEP initiators and other stakeholders. These services are seen as pivotal in creating an environment where community energy initiatives can thrive.

The value assessment was therefore centered on identifying services that could significantly accelerate the development of CEPs. Services with high value are anticipated to trigger substantial investments and foster greater renewable energy production, two of the core KPIs of DISCOVER.

2.1.2 Cost of developing and maintaining such service

The costs associated with the development of these services refer to the resources and efforts required to establish and test each new or advanced service. This includes a variety of factors such as the time required to design and implement the service, as well as any upfront investments needed to develop the infrastructure or technology that supports it. Additionally, the cost estimate reflects the complexity and difficulties involved in creating a new service or integrating an existing service into the market.
The cost assessment takes into account the scale and scope of the service development, evaluating the necessary investments in terms of human resources, technological requirements, and potential regulatory hurdles. Services with higher development costs are typically those that require more substantial investments, more intensive stakeholder coordination, or more complex technological integration. Conversely, services with lower costs are expected to be quicker to develop and deploy, with fewer resource demands.

2.1.3 Result of service selection

By combining both the value and cost rankings, a comprehensive score for each service was generated, which allowed the DISCOVER team to prioritize development efforts. As shown in Table 1, the prioritization process highlights services with high value and low cost - often referred to as “low-hanging fruit” - which are considered the most pressing and will be developed first. These services are assigned a ranking value of "1" and are marked in red, indicating their urgency and priority.
In contrast, services with high costs and low value received a ranking of "6," represented by green-colored cells, and will be developed last, if at all. These services offer lower yield with higher investment, and therefore, present a lower priority. Services ranked in the middle range - values 3, 4, and 5 - add granularity to the prioritization process, helping to fine-tune which services should be developed next based on their balanced potential for value and cost efficiency.
This ranking system provides a clear approach to selecting the four most valuable services for development in the next phases of the project.

Table 1: Evaluation of value and cost. Red = high priority to develop. Green = low priority.

		Value		
		1=high	2	3 = low
Cost	1 = low	1	3	4
	2	3	4	5
	3 = high	4	5	6

2.2 List of new/advanced services

The requirement sheet is designed to outline the service and serve as the foundation for the service development process, targeting the upcoming months. This document covers the following key aspects, which will be addressed for each service:

General:

- **Title**: The name of the new or advanced service.
- **User**: The target users of the service, including where and when the service will be utilized.
- **Background**: The motivation behind the development of this service.
- **Problem Statement**: The challenges CEP initiators face when implementing their projects. This section will define the specific problem that the service will solve.
- **Value Proposition**: The proposed solution to the identified problem. This section will explain how the service will address the problem, eliminate key obstacles, and the benefits it will offer. It will also highlight the features that users will find most valuable.
- **Implementation**: A description of how, by whom, and where the service will be delivered once fully developed. This includes information on who will be responsible for offering the service and how it will be made available to users.
- **Outcome**: The expected outcomes from using the service. This will detail what users will receive after using the service, what they can do with these outcomes, and why these results are important.
- **Inputs**: The necessary inputs required to perform the service, including what must be achieved, defined, or formalized before the service can be launched.
- **Precursors**: Existing elements that can be leveraged as a foundation for the service. This includes previous efforts that can be used as a starting point, who developed them, and, for advanced services, the existing service that is being built upon.
- **Hypotheses**: The initial assumptions guiding the design of the service. This will outline what is presumed to be true and will be validated during the development process.

Development:

- **Mentorship**: The major stakeholders involved during the development of the service. This section will define their role throughout and after the service development, explaining why their input is valuable in shaping the service and ensuring its success with users.
- **Ownership**: The individuals or teams responsible for driving the service development. This section will identify who will provide the necessary expertise and resources for the project.
- **Timeline**: The anticipated timeline for service development, including key milestones that will guide the process.
- **MVP**: The Minimum Viable Product (MVP), which will be a preliminary version of the service with limited but essential features. This section will describe how these features will be simplified to allow for early testing while minimizing development effort.

- **Risks**: The risks associated with the development of this service, including potential roadblocks and showstoppers that could hinder progress.

Reproducibility:

- **Regional Specifics**: The pilot region for which the service will initially be developed, and the underlying regional factors that must be considered. This section will explain what limits the service's usage to this region.
- **Adjustments**: The adjustments needed to make the service reproducible in other pilot regions. This will address what is required to adapt the service for different regions and the expected level of effort involved.

2.2.1 Croatia

Title: Energy Community Analysis and Simulation Services - ECASS.

User: ECASS service will be used in all phases of the establishment of the energy community of citizens. The aim is to set up a platform for collecting user data on energy consumption and production of potential and actual members of the energy community. In addition to analytics, the platform also enables the creation of simulations of energy flows in the community itself, the calculation of surpluses and deficits of energy and the planning of joint investments of the community itself. Targeted users are initiators, establisher, operators of energy communities. The first group of beneficiaries consists of cities and municipalities that are partners in the DISCOVER project, in the pilot region of Drenova.

Background: In the territory of the Republic of Croatia, there are no tools that would enable monitoring the implementation, provide an analysis of energy use, or the simulation of energy flows within projects for the establishment of energy communities. Although this information is crucial for the evaluation of a CEP, existing solutions are limited to education or very primitive tools realized in spreadsheets. In conversations with potential users, a great interest and desire to use such advanced tools was confirmed.

Problem Statement: The problem faced by the initiators for the establishment of energy communities is the lack of methodology and tools for accurate calculation of energy and forecasting the economic benefits that result from joining such communities. It is understood as an underserved need, insufficiently addressed by existing solutions. Since it is not possible to clearly present what the benefits of joining forces would be – there is no interest. The key problem is the lack of publicly available data on energy consumption and production by citizens, which makes it impossible for the average citizen to make calculations. Through integration with existing DSO services, it will be possible to download data and use them in the analysis and simulation of the effects of citizens joining an energy community.

Value Proposition: ECASS will offer a set of integrated services features for user data acquisition, transformation and import into a relational database. The data will then be used for the creation of various statistical reports, and for the creation of what-if analyses in an energy or economic context. The platform service will have simple user interfaces that allows for simple integration into the interactive guidebook and will enable proactive communication and notification of community members.

Implementation: ECASS is a cloud-based application that will be available via a computer or mobile device. Trainings and instructions for users will be available through the educational programs of offered at the OSS in the building of the Drenova community Center or via e-learning platform. Technical support will be provided by the Bez granica OSS team.

Outcome: Key outcome of ECASS service is to provide reliable and customized planning service to any CEP initiator. With the envisioned tool, CEP initiators will be able to better understand all planning, establishment and operational challenges, and to be able to produce more realistic economic simulations of future energy communities. In that sense, we believe more sustainable that this will contribute to properly size a CEPC can be established and with this and therefore increasing our chances to reach the DISCOVER KPIs.

Inputs: To effectively perform the ECASS service, user-specific energy consumption and production data are required. Due to current limitations set by the local Distribution System Operator (DSO), each community member must individually complete administrative procedures to gain access to their energy data records. Only after completing this step, can data be securely imported and processed within the ECASS platform, following the predefined data governance and security procedures.

Precursors: Previous efforts by various stakeholders in establishing energy communities have led to basic educational resources and primitive analytical tools primarily using spreadsheets. Despite these initiatives, significant gaps remain, particularly in automating data collection, comprehensive analytical capabilities, and dynamic simulation of energy and economic outcomes. ECASS will leverage existing basic analytical frameworks as a foundation, enhancing them substantially through automated data integration, advanced statistical analyses, and robust "what-if" scenario modelling. Core components, such as initial data structures and rudimentary calculation models, are already in place and will be expanded and refined within ECASS.

Hypotheses: We hypothesize that providing CEP initiators with a data-driven, automated, user-friendly platform will streamline the planning and operational processes, thereby significantly accelerating the establishment of successful and sustainable energy communities. Enhanced transparency and accuracy in economic simulations and energy forecasting are expected to directly contribute to achieving the KPIs of the DISCOVER project.

Mentorship: The primary stakeholders involved during ECASS's development phase will include Croatian energy experts and representatives from existing energy communities, particularly those already partnered within the DISCOVER project. Their practical insights and continuous feedback will validate our assumptions, guide the iterative development process, and ensure alignment with market needs, thereby confirming that ECASS is a viable product-market fit.

Ownership: Development will be primarily managed internally by the Bez Granica OSS technical team, leveraging their expertise in cloud-based solutions and energy data analytics. However, certain specialized tasks such as legal and compliancy subject, cybersecurity enhancements, and integration with DSO services may require strategic outsourcing to specialized external partners. Collaborating with these experts will facilitate faster, higher-quality outcomes and help mitigate technical and operational risks.

Timeline: The development of ECASS is anticipated to span approximately six months, structured around key milestones including:

- Initial requirements gathering and prototype design (month 1)
- Development of data integration and user interface (months 2-3)
- Internal testing and iteration of initial functionalities (month 4)
- Pilot testing with selected CEP initiators and further refinement based on feedback (month 5)
- Final adjustments, deployment preparation, and user training materials completion (month 6)

MVP: The MVP for ECASS will include core functionalities such as user data acquisition, basic analytical reporting, and preliminary "what-if" simulations in both energy and economic contexts. Early prototypes, characterized by minimal but functional feature sets, will enable ongoing validation through iterative testing with community initiators. These early-stage tests will verify the relevance and utility of ECASS's core features, allowing for necessary adjustments well before the full-scale development effort is completed.

Risks: Potential risks identified during ECASS development include:

- Delays in administrative approval for data access from DSO, impacting timely data availability.
- Technical challenges integrating disparate data sources into a unified platform.
- User adoption barriers due to complexity or perceived lack of immediate benefit. Mitigation strategies include proactive collaboration with DSO authorities, leveraging experienced external partners for integration complexities, and continuous user feedback loops to refine usability and demonstrate clear, immediate strong value proposition.

Regional Specifics: ECASS is designed with scalability and reproducibility in mind, acknowledging that each pilot region may have unique regional characteristics, including regulatory frameworks, energy infrastructure, and data accessibility standards.

Adjustments: To replicate the ECASS service effectively across other pilot regions, initial customization efforts will focus primarily on adapting data collection methodologies, integration procedures with local DSOs, and localization of user interfaces and reporting modules. These adjustments will ensure relevance and compliance with local requirements. Overall, these modifications are expected to involve moderate effort, given the modular design and flexibility built into the ECASS platform.

2.2.2 France

Title: Analysis of opportunity for PV projects – technical, economic, and legal dimensions.

User: The service will be used by condominium representatives in Paris who intend to launch a PV project in their building, during the development phase of the CEP. Their building administrators will be associated if needed as legal actors of condominiums. More than a third of Paris condominiums are connected to Paris Climate Agency through the Coachcopro web platform. The service will be offered to any condominium once registered to Coachcopro. The service might be disseminated to other regions using Coachcopro in France.

Background: Condominium is by far the main form of housing in Paris. It is a legal entity that can act as a foundation to an energy community at the very local scale. However, no existing EC has integrated any condominium in Paris so far, almost no condominium is forming itself into an EC either, and very few have developed PV plants on their rooftop. Condominiums have a real potential that this service will help to activate, as part of the whole One-stop-shop experience. It was observed during the DISCOVER project that, on the one hand, existing services to PV and EC are not tailored to the specific needs of condominiums, and, on the other hand, that existing services to condominiums in Paris for energy renovation do not tackle the PV and EC solutions in a sufficient way. The service aims at bridging this gap.

Problem Statement: A CEP initiator in a condominium today faces many hurdles, one of the first being to know what to expect from its building rooftop as a PV plant. A CEP initiator has to know how much of the electricity its building can self-consume and how it can value the surplus with neighbors, within a Collective Self-Consumption operation (CSC). The service will evaluate the expected savings on bills, and revenue streams from marketing surplus electricity, and provide sufficient knowledge to understand the opportunities and constraints to help navigate through the first steps of a CEP.

Value Proposition: We will deliver a free service, neutral and independent, as we are a non-profit association. The solution we want to offer will follow a regular pattern and address at least four issues: 1) Production, 2) Self-consumption, 3) Economy, 4) Urbanism and legal aspects. We want each analysis of opportunity to be tailored to the need of each condominium, and the service should start by an online introductory meeting. The analysis will be delivered in successive steps, with necessary explanations and exchange of information for each issue at each step. We will ensure that the user gets the right comprehension of the complex matter and can act as an ambassador to their fellow co-owners within the condominium and, potentially, their neighbors. A final synthesis will be sent to the user.

Implementation: We will deliver the service in the form of a final chartered PDF document, and through emails, exchanges of information, and online meetings required in the process leading to the PDF document edition. It will be operated by a core team of renewable energy experts at APC with the contribution of the whole energy renovation team (around 25 advisors in March 2025). Additionally, the service might be available as part of the interactive guidebook.

Outcome: After using the service, we expect that the project initiator can form a group project within its condominium, if not formed already, and state a clear strategy, and engage in the next step of a PV project, which is to pay professionals for a complete feasibility study, ask for a permit, etc. We expect that more than half of the users receiving the service will engage in a feasibility study, and that a portion of them will engage in a larger community project involving neighbors and collective self-consumption (with flats, shops, offices, etc.).

Inputs: The service will be offered to any condominium representative registered in Coachcopro that states to us the need for support in a PV project within their condominium. The Service will start with the first issue (Production). It will be further developed depending on the results, available data, and motivation of the user. The second issue (Self-consumption) will need a formal authorization, and treatment of the condominium's consumption data from the DSO. The third issue (Economy) will need an electricity bill. The service requires a running software license (we use Autocalsol software to date). Legal advisors will be consulted in the development phase of the service.

Precursors: The service is an extension of the core service delivered by Paris Climate Agency (APC). APC is the One-Stop-Shop for the eco-renovation of condominiums in Paris. The service will therefore be built on our experience of energy renovation (insulation, heating system, greening, etc.), with a new expertise in renewable and PV energies, and community energy projects. Existing processes and tools at APC will be upgraded, building upon the Specific Guidebook and all guidebooks and contents available on PV and EC projects in France and Paris.

Hypotheses: Our goal of pushing more condominiums into the next step of professional feasibility studies is based on the assumptions that 1) the technical, economic, and legal knowledge is necessary for their boards and assemblies to take the decision to pay for such studies (that should cost between 5 K€ and 15 K€), and 2) this knowledge will help them in dealing correctly with professionals. It is important to note that professionals should also improve and adapt to the specific context of Parisian roofscape and market.

Mentorship: We are working along with several experienced stakeholders in the technical and economic fields (EnerCitIF, Enercoop, Enogrid, INES…). We will also get in touch with legal experts (ADIL 75), and administrations (Paris City, Great Paris Metropolis, Ministry heritage protection service). We will refer to Paris City officials. Necessarily, we are working in close relation to the DSO Enedis, whose collaboration is capital for success. Only Enedis can provide load curves to simulate self-consumption.

Ownership: APC will drive the development. We will need the involvement of DSO collaboration to get consumption data. Building a partnership will be necessary.

Timeline: APC started development of a prototype in December 2024. An improved service prototype will be proposed by Spring of 2025. The service will be fully operational by the end of 2025.

MVP: The service shall be tested continuously during the development. We will test it by using the prototype versions of December 2024 then of Spring 2025 with project initiators (condominiums). The MVP would look like:

- An online introductory meeting: A quick, initial online session with an advisor to understand the condominium's needs and collect necessary data.
- Technical feasibility: An early-stage analysis of how much electricity the building can consume locally and how much can be shared with neighbors in a Collective Self-Consumption (CSC).
- Basic economic overview: An initial estimate of the financial benefits, including cost savings on electricity and potential income from surplus energy.
- Initial legal/urbanism considerations: High-level advice regarding legal and urbanism constraints, ensuring the project is feasible within Paris regulations.
- Final synthesized document: A simple, clear, and chartered document summarizing the initial findings, including analysis of the building, next steps, and recommendations.

Risks:

- User Engagement and Understanding: There is a risk that condominium representatives might not fully engage with the service or lack the technical knowledge to understand the analysis. This could result in low adoption rates or the inability to make informed decisions.

- Coordination with Multiple Stakeholders: The service requires close collaboration with various stakeholders, first of all the DSO, then engineering professionals who will have the project in charge, and delays or lack of cooperation from any of these parties could hinder the service's development or effectiveness.
- Technical Complexity: The service involves technical aspects of PV systems, energy consumption modelling, and legal regulations, all of which are complex and could lead to potential misunderstandings or delays. Complexity increases for CSC operations.
- Complexity of Interface with Related Topics: Planning a PV plant in a condominium may be part of a larger, energy renovation project (insulation, heating system…). This service must stand alone but also be integrated within the energy renovation scheme already existing in Paris. It should also be interfaced with other possible valuations of the rooftop (greening, building over…) to help the best decision-making.
- Legal and Regulatory Hurdles: Navigating the legal and urbanism constraints in Paris can be complex. If the legal framework or regulatory bodies change, it might require updates to the service to stay compliant. Heritage protection constraints are particularly difficult to anticipate with accuracy.
- Financial Constraints: Given that this is a free service, the challenge will be to sustain funding for ongoing development and operation, ensuring that the service is viable long-term without compromising on quality.

Regional Specifics: Urban Context of Paris: The high density and complex urban environment in Paris, with many older buildings and architectural restrictions, will influence how PV projects are developed. There are specific regulations for rooftop installations, conservation laws, and limitations on how the aesthetics of buildings can be altered, which will need to be addressed. Condominium Management Culture: In Paris, condominiums often have complex governance structures, which might pose challenges in making decisions on collective projects. Understanding local decision-making dynamics and the role of condominium representatives and administrators is key.

Adjustments: The service may be useful for other One-stop-shops whose value proposition is common to APC: help building owners to decide whether to launch a PV plant project and promote the integration of PV plants into neighborhood-scale energy communities. Rolling out the service would require significant adjustments though. Technical hypothesis (how much I can produce on a given surface) are common to different regions, however, the fact that the service at APC focuses on condominium buildings makes it quite specific (in terms of physical, electrical constraints and social implications). Economic hypothesis and legal framework should be entirely adjusted too. The implementation of the service should also be adjusted to the means of the pilot capacities. First, the service at APC will be embedded into Coachcopro user experience. Additionally, the Autocalsol software, which is integral to the service, is not typically available at other One-Stop Shops but other software can be used. Inputs to the service should also be considered locally. For example, the procedures to collect consumption data from customers depend on the national framework and the local DSO.

2.2.3 Bulgaria

Title: CEP Real Life Modeling (CEP - RLM).

User: The service is for CEP initiators during the planning phase of their project, specifically during the establishment of an EC and the planning of a PV installation. It is most relevant to small municipalities in Bulgaria looking to develop a clear CEP concept, form an organizing committee, and secure municipal support. This includes obtaining consent for public plots, roofs, or territories identified in Local Development Plans.

Background: We discovered that obtaining permits for a PV project is highly complex, involving over 10 steps with sub-steps, 29 documents, and typically taking at least 8 months. This bureaucratic burden has hindered PV development. As a result, 19 out of 20 potential PV plants never get started because initiators struggle to create a clear, actionable plan and never reach the stage of selecting the best legal structure for the energy community. The key challenge for CEP initiators is defining both the technological and legal framework—determining the scope of PV installations and choosing the right legal form of an EC (e.g., cooperative, public interest company, trust, association, limited partnership). We provide guidance on the CEP’s core concept, showcasing a set number (e.g., 8-10) real-life EC models.

Problem Statement: CEP initiators and future members are often reluctant to engage in a lengthy administrative process with an uncertain outcome. Their first key task is to define both the technological concept and legal form of the EC; determining the scope of installations and selecting the most suitable structure based on technological opportunities and members’ composition. A major challenge is the connection to the grid. If no suitable connection point exists, the grid operator may block the project, even if it is designed for 100% self-consumption. Establishing a grid connection often requires costly additional infrastructure at the owner's expense. The high costs and complex permitting process typically outweigh the expected benefits, leading most initiators to abandon the project at this stage.

Value Proposition: Our solution is to simulate models of successful projects. By exploring these models, initiators can identify one or two that maximize revenues while minimizing administrative hurdles and unnecessary dependencies on businesses or state/municipal bodies. They can then tailor the selected model to fit their financial, material, and human resources, leveraging our support through the OSS to develop a viable, profitable, and predictable project. With an informed choice of the optimal technological concept and legal structure, initiators will be ready for the next steps in project development. This includes completing the application forms, engaging with the DSO to secure a connection point, and, with our assistance, commissioning a pre-feasibility study and project design, covering electrical, architectural, geodesic, and structural parts. Finally, they will be equipped to prepare the full document package required for a PV building permit application.

1. Define the initial technological concept of the CEP, aligning with the business goals and available resources of the members.
2. Determine the most suitable legal structure for establishing the EC.
3. Draft a lease or other agreement between the future EC entity and property owners (if applicable).
4. Obtain a property sketch from the district municipality.
5. Secure provisional declarations of consent for the PV installation, which will later be formalized into a notarized building permit agreement between the property owner and the legal entity.

Implementation: The CEP models are real-life examples and will be fully developed by experienced engineering and legal experts and provided through the OSS, operated by IESDI in Sofia. Additionally, the service will be accessible online as part of the interactive DISCOVER guidebook.

Outcome: After using the service, CEP initiators are expected to gain approval from initial community members participating in the CEP as well as financial institutions. By selecting the most suitable technological setup and legal structure for their EC, they will be better positioned to navigate administrative hurdles with the support of the OSS. This will accelerate the launch of new CEPs, significantly improving our chances of meeting the DISCOVER KPIs.

Inputs: This service is provided at an early stage of the CEP lifecycle. There are no precursors or gating results that could hinder offering this service in the OSS. However, it is crucial to understand the boundary conditions of the CEP, as they significantly impact the outcome of this service.

Precursors: Building on previous efforts by IESDI and its partners, we have identified 6 basic CEP models, covering technological approaches, legal structures, and business schemes. We have also recognized a significant number of gaps that are not addressed by existing services, particularly those favoring PV and other CEPs managed by DSOs, TSOs, and municipal authorities. To fill these gaps, we plan to expand the existing 6 basic models into 8 (or 10) real-life EC models, incorporating both technological concepts and the most suitable legal forms.

Hypotheses: Our goal of addressing the problem through real-life EC models is based on the assumption that initiators and founding EC members will successfully overcome the initial barrier of unawareness regarding the potential benefits of ECs, as well as the process of creating and developing them.

Mentorship: The key stakeholders during the development phase will be municipalities, partners of IESDI, Chamber of Energy Communities in Bulgaria (CECB) and Sustainable Energy development

Agency (SEDA). Additionally, we will draw on the real-life experience of investors within these municipalities. Their insights into the challenges faced by PV projects and CEPs, along with their solutions, will be invaluable. Ongoing feedback from these stakeholders throughout the development process will help us validate our assumptions and ensure that our service is truly aligned with market needs.

Ownership: The development of the CEP-RLM will be organized by IESDI.

Timeline: We expect the development of the service to take 2 months and will include the following milestones:

1. Signing a lease agreement for the use of Grid-one software, Sunny Design, or another cutting-edge modelling software.
2. Training the OSS experts in using the selected modelling software.
3. Establishment of the OSS (both virtual and physical).
4. Launching a mass direct marketing campaign targeting municipalities in Sofia and Gabrovo region, aimed at raising awareness of the DISCOVER platform and the advanced services it offers.

MVP: The MVP will consist of 8 to 10 real-life models for ECs based on PV plants. These models will include both technological concepts and suitable legal structures, tailored to fit different scenarios and needs of the municipalities and initiators.

Risks: We recognize that the legal framework in Bulgaria (and the EU) regarding CEPs and ECs is constantly evolving. This dynamic nature will require us to regularly update our real-life CEP models throughout the design and development phases to ensure they remain aligned with current regulations and best practices. We will monitor legal changes closely and make necessary adjustments to our models to maintain their relevance and compliance with the latest legal requirements.

Regional Specifics: The best-practice models developed for Bulgaria are specific to this pilot region and its unique legislation.

Adjustments: Replicating the models in other pilot regions is not straightforward. However, the development of real-life CEP models for these regions could still benefit from the Bulgarian solutions, which may offer valuable guidance and inspiration.

2.2.4 Italy

Title: Preliminary Technical – Economical Assessment for CEPs

User: This service is primarily intended for municipalities, religious entities, and citizens, especially during the planning phase of the Community Energy Project (CEP) life cycle. The focus is primarily on municipalities, as they are the key stakeholders with whom AGENA is most involved in its mission. Additionally, municipalities with populations under 5,000 inhabitants are particularly interested in the National Recovery and Resilience Plan (NRRP), that provides capital grants to set up energy communities.

Background: We have found that a lack of knowledge, an inability to fully grasp the potential behind CEPs, and the limited internal resources of municipalities are major barriers hindering CEP development. We believe that addressing these issues can catalyze the evolution of CEPs.

Problem Statement: CEP initiators face several challenges when starting the process. Municipalities, in particular, struggle with limited economic resources. The main problem addressed by this service is the lack of understanding regarding the sustainability of investing in PV, which often prevents CEPs from moving forward at an early stage.

Value Proposition: AGENA will serve as a single point of contact, providing commercial independence and neutrality. We will offer tailored consulting services free of charge to municipalities, religious entities, and citizens interested in CEP development.

Service Details: The service will involve supporting project initiators in developing a preliminary economic feasibility analysis of their investment through an initial cost-benefit assessment. This will be based on an energy autonomy analysis that examines the complementarity between load and generation profiles. The analysis will be structured around the following points:

- Identification of potential CEP members
- Characteristics of their electricity production profiles and electricity consumption profiles
- Analysis of energy trading potential within the community

For the economic assessment, it will be necessary to account for costs (such as investment, operational, and maintenance costs), available incentive schemes (e.g., NRRP), and revenues (e.g., revenues from grid sales, self- consumption configurations for renewable energy sharing (CACER) incentives, ARERA (Regulatory Authority for Energy, Networks and Environment) compensation, savings on electricity supply costs, and revenues from other incentives and financing options). We will analyze four different financing models:

1. PV plant fully funded by members

2. PV plant funded through a bank loan
3. PV plant funded by a third party (e.g., ESCO or utility)
4. PV plant built using NRRP funds

Implementation: Once the service is fully developed, it will be offered in person at AGENA's office, located in Teramo, Piazza Garibaldi, 56. The service will be run by AGENA's technical staff (four people). Additionally, the service will be available online as part of the interactive guidebook.

Outcomes: The preliminary technical-economic assessment will provide clarity on the estimated costs and benefits over the CEP's lifespan, enabling project initiators to make informed investment decisions. It will compare different financing models to help identify the best business model for the project. The results will be provided in the form of a report. These outcomes are expected to catalyze the launch of new CEPs, increasing our chances of meeting the DISCOVER KPIs.

Inputs: AGENA will require a formal request from the project initiator to begin the development phase and access energy bills of potential members, along with ideally energy consumption profiles. Information on the available space for the PV installation is needed, as well as an understanding of electricity costs, investment costs, and available funding sources.

Precursors: Previous initiatives by GSE, the Italian Energy Services Manager, aimed at addressing this issue at the national level resulted in a platform (https://www.gse.it/servizi-per-te/autoconsumo/gruppi-di-autoconsumatori-e-comunita-di-energia-rinnovabile) offering tools for energy and financial assessment, maps of primary substations, manuals, and training. We have identified several gaps in the existing services: a need for local expertise that understands the territory and its dynamics, and that can offer face-to-face support to local initiators. Our advanced services will modify these existing tools by adapting them to local territorial needs.

Hypotheses: We believe in the economic feasibility of CEPs and the availability of investors willing to launch new projects after presenting to them that CEPs as viable investment.

Mentorship: The major mentors during the development phase will include the Province of Teramo, RENAEL (the Italian network of local energy agencies, of which AGENA is a member), and GSE. GSE will create incentive and financing instruments to support REC deployment, and provide information, training, and administrative simplification. As RENAEL has an agreement with GSE to collaborate on REC-related matters. RENAEL will also provide insights based on its participation in roundtables for the Enea (Italian National Agency for New Technologies, Energy and Sustainable Economic Development) RECs Observatory and its close collaboration with MASE (Ministry of the Environment and Energy Security) and GSE. Continuous feedback from these mentors will be essential for validating our assumptions and ensuring market fit for the service.

Ownership: We expect the service to be developed by AGENA’s personnel, with outsourcing for legal and taxation issues.

Timeline: The development of the service is expected to be completed by 2025 and will include the following milestones:

1. Establishing methods to calculate costs for PV installation and operation (month 1)
2. Developing methods to calculate electricity flows (month 1-2)
3. Defining methods to evaluate financing costs (month 2)
4. Pilot testing with selected CEP initiators and further refinement based on feedback (month 5)
5. Final adjustments (month 6)

MVP: The MVP will consist of four business models, using an assumption for energy autonomy (instead of performing a detailed energy analysis).

Risks:

- Risk of discovering that CEPs are not a viable investment
- Availability of reliable electricity demand and supply curves
- Risk of the analysis becoming too complex to apply to various scenarios

Regional Specifics: The service is built to ensure it can be scaled and replicated, taking into account that each pilot region may have its own features (i.e. legislative framework, funding opportunities, technical constraints). Currently, the Province of Teramo has specific funding schemes thanks to the Italian government. In addition, the service must address the unique motivations of local actors, including for example religious entities that focus on combating energy poverty.

Adjustments: While the tool will be largely applicable to other pilot regions, the calculations are based on certain parameters that are context-specific to the province of Teramo. These parameters will need to be adjusted for each pilot region, such as the annual solar yield. Moreover, aspects related to the funding can vary. In fact, some Italian regions has provided additional funds to facilitate the setting-up of RECs, that must be included to assess the profitability of the investment.

3 Conclusion

DISCOVER's mission is to support Community Energy Projects (CEPs) by providing tailored services to CEP initiators through local one-stop shops (OSSs) established in four pilot regions. Our goal is to leverage existing support services and consolidate them into the DISCOVER guidebook. Additionally, one new/advanced service will be developed for each pilot region. This document outlines the **requirements** for these new/advanced services, which will serve as a framework for their development over the coming months.

- New/advanced services are designed to further expand the support available to CEPs, providing additional tools in the "toolbelt" of each OSS. The **development** of these services is expected to be completed by the end of 2025, but it will not interfere or delay support activities at the OSS.
- The nominated services for each pilot region are summarized below. These services are anticipated to be used primarily during the **early planning phase** of CEPs, which typically involve the establishment of PV plants and energy communities (ECs).
- Although each new/advanced service is developed to address specific regional needs, efforts will be made to create **synergies** across pilot regions, enabling the services to be used in multiple regions. This multi-use approach will enhance the impact of the services.
- The **target users** of these services are CEP initiators, including citizens (Croatia), municipalities (Italy, Bulgaria), and condominium representatives (France).
- The new or advanced services will be **available** in the corresponding OSS. Additionally, there are plans to implement these services as standalone web tools (in Croatia) and as enhancements to existing renovation web platforms (in France).

In three cases (Croatia, Italy, France), the focus of the new/advanced services will be on the **economic evaluation** of CEPs. The aim is to provide insights into the financial benefits of establishing a CEP. This includes an energy analysis to assess the potential for electricity trading within an EC, which involves comparing load curves and calculating electricity surpluses and deficits. To conduct this analysis, data on the energy consumption and production of potential EC members will need to be collected.

In Bulgaria, the focus will be on showcasing business models for CEPs, streamlining the approval process for PV installations, and providing best-practice examples for the establishment of ECs. This will also include a certain level of legal advice as part of the new/advanced service, which will be offered in both Bulgaria and France.

CROATIA - **Analysis and Simulation**

Target users for this service are initiators of ECs. The goal is to support the establishment of ECs by providing economic simulations based on energy flow analyses. A major pain point this service addresses is the lack of easily accessible electricity consumption data. The service aims to integrate with existing DSO services, enabling the download and integration of relevant data for simulations. The implementation will involve a cloud-based application. While the core components, such as initial data structures and rudimentary calculation models, are already in place, these will be expanded in the future. This service can also be adapted for use in other pilot regions after adjusting the data collection methodologies.

FRANCE - **Technical, Economic, and Legal Analysis**

This service targets condominium representatives who are considering launching a PV project and establishing a collective self-consumption operation. The goal is to provide a comprehensive feasibility study for CEPs, which includes an analysis of energy flows and economic viability, alongside high-level guidance on urbanism and legal constraints. Condominiums have special needs that existing services cannot fully address, especially due to their complex governance structures. Heritage protection laws pose additional challenges. The service will be integrated into the existing Coachcopro web platform, which currently supports energy renovation services for one-third of Paris' condominiums. The economic analysis will be conducted using the Autocalsol software (a licensed tool), and the service will primarily focus on condominiums with.

ITALY - **Preliminary Technical-Economic Assessment**

The target users for this service are municipalities and religious entities. The goal is to provide them with a clear understanding of the benefits of investing in PV and launching a CEP. This includes identifying EC members, analyzing electricity flow, and evaluating the trading potential within the community. The service will result in a cost-benefit analysis that catalyzes investment decisions for PV. The assessment will consider available incentive schemes and funding options, alongside four different financing models. The analysis will include a life cycle cost evaluation, with existing tools being enhanced and adapted to meet local territorial needs.

BULGARIA - **Modeling of Community Energy Projects**

The main hurdle this service aims to address is the lack of a clear technological and legal framework. The goal is to determine the scope of PV installations (including electrical, architectural, geodesic, and structural components), while also selecting the most suitable legal form for an EC and preparing agreements needed by property owners who lease their space for PV installations. This will be achieved by showcasing 8-10 real-life CEP models, “best-case examples”, which will help identify the most effective CEP setup to maximize revenue and minimize administrative hurdles. Additionally, the service will facilitate the application for PV building permits and grid connection points. Six basic CEP models are already developed and will be enhanced to be applicable for PV installations, adding an additional 2-4 models. The best-practice models created for Bulgaria will be specific to the region's unique legislative framework.

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