Empowering Renewable and Citizen Energy Communities

Deliverable D2.1

Landscape analysis reports and regional networks

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Preface

The POWER-E-COM project aims to foster the cooperation between regional/local authorities and citizens to establish energy community projects in six different European countries. By supporting the development of models and tools that facilitate the creation of energy communities, the project aims to empower citizens to take a more active role in the energy transition.

Work package 2 provides a thorough understanding of the REC/CEC landscape in each region/country and key stakeholders involved, identifying specific needs, challenges and potential solutions on which the activities and materials of the following WPs will be developed. Furthermore, internal capacity building to ensure that the necessary know-how is available will be provided, and stakeholders and networks for all project activities activated.
Following document D2.1 describes the ground for energy communities in the six POWER-E-COM partner countries ([Upper] Austria, Bulgaria, Germany, Ireland, Slovenia, and Spain), by assessing the national framework for energy sharing and status of market development as of April 2024. Furthermore, the so-called Energy Community Transition Offices (ECTOs) are described in D2.1. The ECTOs will be set up in the six partner countries and shall provide useful support for citizens and authorities for starting new energy communities.

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1. Introduction

Based on a template developed by the WP2 leader ESV, each POWER-E-COM partner analysed the current landscape of REC/CEC in their region/country ([Upper] Austria, Bulgaria, Germany, Ireland, Slovenia, and Spain).

These analyses provide the basis for the ensuing work packages by ensuring a thorough understanding of the REC/CEC landscape in each region/country and key stakeholders involved.

This report D2.1 summaries the information of task 2.1 collected by the project partners.

2. National framework for energy sharing and status of market development

2.1. Upper Austria

In Upper Austria, the national implementation of the EU directives concerning energy communities (ECs), is completed and the regulatory framework for the establishment of renewable energy communities (RECs) and citizens energy communities (CECs) is in place.

This was done step by step starting already in 2021, the recent legal implementation concerned the citizens energy communities which are legally possible across DSOs (Distribution System Operators) since October 2023. The practical requirements for implementation of CECs are in place since April 2024.

Four main types of energy communities are possible:

- local RECs which are served by the same low-voltage substation
- regional RECs, served by the same mid-voltage substation
- CECs, where no proximity requirement is given, they can even cover the concession area of several DSOs.
- GEAs (Gemeinschaftliche Erzeugungsanlagen – collective generation facilities) for the joint PV production and use of several consumers in one building

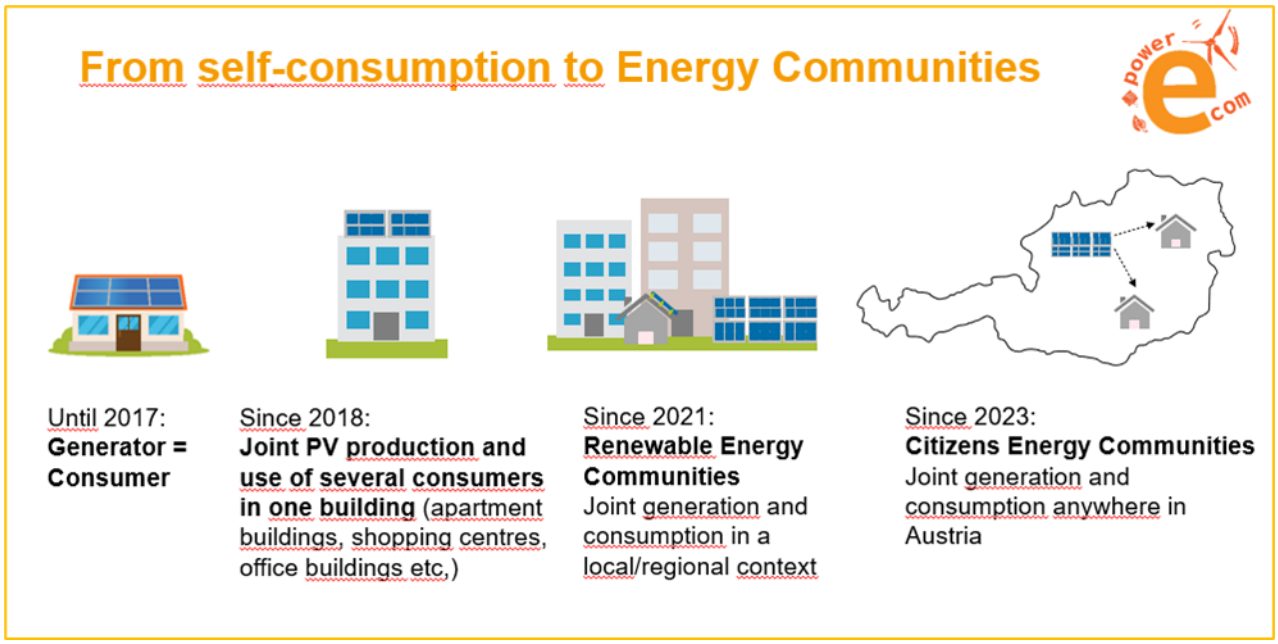

Figure 1: Overview of development of energy community framework

Presently there are more than 250 RECs, more than 20 CECs and more than 700 "GEAs" in operation in Upper Austria. In total, ECs count over 4,000 members.

Table 1: Energy community definitions in Austria

Types	Joint PV production and use of several consumers in one building (GEA)	Renewable Energy Communities (REC)		Citizens Energy Communities (CEC)
		local	regional	
At least two participants	yes	yes		yes
Energy source	electricity (PV)	renewable electricity and heat		electricity (renewable and fossil)
Legal construction	contract	legal form		legal form
Reduction of grid tariffs	yes	yes		no
Area limitation	yes	yes		no

2.2. Bulgaria

Bulgarian consumers are allowed to form Renewable Energy Communities (RECs). End consumers can participate in RECs without compromising their rights or obligations.

For businesses, participation must be distinct from their primary commercial or professional activities.

Bulgarian RECs are empowered to produce, consume, store, and sell surplus energy from renewable sources on equal terms in energy markets, including through power purchase agreements.

The definition of RECs outlined in the national law closely mirrors that of the Directive. These communities own and operate renewable energy installations within urbanized areas, with the energy produced consumed by stakeholders. Comprising a diverse mix of individuals, small and medium-sized enterprises (SMEs), or municipalities are acting as shareholders, partners, or members.

End electricity consumers can generate renewable energy individually or collectively for personal use only and can access all segments of the free energy market.

The Renewable Energy Act expands the scope of RECs beyond electricity production to encompass heating and cooling, utilizing various renewable sources.

2.3. Germany

At the beginning of 2024, Germany still lacks a full integration of a directive-conform implementation framework for establishing RECs/CECs for electricity sharing.

Existing forms of energy communities/companies are energy cooperatives (EnCos) or limited liability companies (GmbH/UG & Co. KG), and private corporations ("Gesellschaft bürgerlichen Rechts").

In Germany, § 3 no. 15 EEG 2023 defines the "citizens' energy company/society" with at least 50 natural persons as members or shareholders with voting rights, local anchoring (at least 75 per cent of the voting rights are held by natural persons who live in a postcode area that is wholly or partly within a 50-kilometre radius of the planned plant), defined distribution of voting rights, and the control of the community.

Heat sharing is often indirectly realised in Germany in Thermal Energy Communities (often in the form of an EnCo).

In the beginning of 2024, there were 877 ECs with 220,000 members in Germany, and more than 600 energy communities/companies organised as limited liability companies (GmbH/UG & Co. KG), mainly operation of wind parks.

Update April 24: it is now possible that house owners or communities of owners can start a community/ collective building power supply (“Gemeinschaftliche Gebäudeversorgung”). Being a decentralised model, it enables the use of self-generated solar power in multi-party buildings.

Table 2: Germany - overview participation level (checklist for directive conform RECs/CECs)

	Participation			
	Financial	Decision making process	Energy Production	Energy Self-Consumption
District heating	(✓)	(✓)	(✓)	✓
Municipal energy utilities		((✓))		✓
Cooperatives	✓	(✓)	✓	
Tenant-power				✓
Arealnetze	(✓)		(✓)	✓
Investment products related to local/regional energy production	✓			

Table 3: Germany - Level of implementation of RECs/CECs (according to https://energiegemeinschaften.gv.at/)

Regulatory	Balancing		Suitable for	
	Physical	Virtual	Heat sharing	Electricity sharing
Independent energy supply at building level (multi-family dwellings)	✓			✓
Decentralised energy supply in a power network (REC)				
within a local area	✓	✓	✓	✓
within a regional area	✓	✓	✓	✓
Decentralised energy supply across network areas (CEC)	✓	✓		✓

2.4. Ireland

The first step in the process in Ireland was taken the creation a system of Sustainable Energy Communities or SECs in 2015, a dedicated programme delivered by the Sustainable Energy Authority of Ireland (SEAI), which enables and engages citizens to achieve their energy goals.

The energy generation support consists of a scheme tailored to allow for participation by Renewable Energy Communities, and in particular 'community-led' projects, which are defined by the scheme.

In 2021, the Department of Environment, Climate & Communications (DECC) included a specific mechanism for RECs in their Renewable Electricity Support Scheme (RESS), which aimed to support renewable energy production in Ireland generally. Specifically, a percentage of capacity being auctioned off has been ringfenced for projects that qualify as community-led projects.

Under this scheme, RECs only need to compete with each other, instead of with larger project developers.

7 community energy renewable projects were approved under RESS 1 and (as of April 2024) none have commenced, two of the successful candidate communities have provided support letters for the POWER-E-COM project.

Both RECs and CECs must be legal entities based on open and voluntary participation, autonomous and effectively controlled by their members to participate in the scheme as specified in RESS. Their primary purpose should be to provide environmental, economic or social benefits to their partners or members or to the local areas where they operate, rather than financial gains.

SECs by comparison do not require any formal legal organisation.

2.1. Slovenia

In Slovenia, end consumers can connect to community self-supply through a contractual basis (according to the rules of obligation law or by establishing a legal entity (Article 37, ZSROVE)).

When a third party - owning or managing an electricity production device - is involved, end consumers typically form a community self-supply through a contract, for larger areas with more production devices, a public-private partnership process is often conducted, while smaller municipalities may issue a public call, followed by a public procurement process.

Energy cooperatives are commonly established as legal entities, at least three founding members, an Act of Establishment, and Cooperative Rules (Statute) adopted at the first founding general assembly are required. Larger projects may involve setting up project companies where an energy cooperative is a partner.

End consumers either connect through a contractual agreement under obligation law or establish a legal entity (often a cooperative).

Table 4: Slovenia - overview CEC and REC schemes

	Citizen Energy Community – CEC	Renewable Energy Community - REC
Membership	Members are individuals, local authorities, including municipalities, or small businesses.	Members or associates are individuals, SMEs, or local authorities, including municipalities.
Geographical Restrictions	There are no geographical restrictions for members connected to the distribution system in the Republic of Slovenia. Citizenship of the Republic of Slovenia is not a condition for membership.	A legal entity based on open and voluntary participation is independent and is controlled by members or associates who are located near renewable energy projects and are connected to the distribution network in the Republic of Slovenia!
Permitted Activities	Limited to the EE sector, participating in the production of EE from renewable sources, supply of EE, consumption, aggregation, energy storage, energy efficiency services, or providing e-vehicle charging services and other energy services for members.	Can operate in all energy sectors, the main goal is to provide environmental, economic, and social community benefits for its members or associates or local areas where it operates.
Technologies	Technologically neutral	Limited to technologies for exploiting renewable energy sources.
Legal Basis	Electricity Supply Act (ZOEE), Official Gazette of the Republic of Slovenia, no. 172/21	Act on the Promotion of the Use of Renewable Energy Sources (ZSROVE), Official Gazette of the Republic of Slovenia, no. 121/21

2.2. Spain

In Spain, the transposition of European directives enabling energy communities is implemented for Renewable Energy Communities (REC) and partially implemented for Citizen Energy Communities (CEC).

Energy communities make use of the collective self-consumption regulation, which allows to produce and provide final consumers with electric energy from renewable energies, without paying for the grid costs, if any of the following rules are fulfilled:

- Are connected to the internal network of the associated consumers or are linked to them by direct lines.
- Are connected to any of the low-voltage networks derived from the same transformer substation.
- Both generation and consumption are connected at low voltage and at a distance of less than 500 meters between them.
- Both generation and consumption are located in the same cadastral reference according to their first 14 digits or, where appropriate, according to the provisions of the twentieth additional provision of Royal Decree 413/2014, of June 6, 2014.

Royal Decree-Law 20/2022, of 27 December 2022 modifies the previous regulation and, in the particular case of PV installations, this distance may be up to 2,000 m as long as the PV installation is located entirely in: roofs of one or more buildings, or industrial floor, or artificial structures whose primary purpose is not the generation of electricity.

The most common legal forms currently used to create energy communities are cooperative, association and SME (small and medium-sized enterprises) with social aims.

According to the National Energy Agency, IDEA, there are currently 69 REC/CECs with overall 103.000 members active in Spain (12/2023).

A typical example for a Spanish energy community is shown in table 5.

Table 5: Example of Spanish energy community COMPTEM

REC/CEC name	CEC/REC COMPTEM Energy Community in Crevillent (Alicante)
Role of involved actors and model	Municipal Collaboration, Crevillent Electric Cooperative and ENERCOOP Group Crevillent Electric Cooperative (Enercoop Group) - Marketer, development agent, and will be the one who makes the investment. Municipal collaboration - Transfer of two municipal plots of 2500 square meters
Legal form and members	Cooperative Citizens of Crevillent are the members of the CEC/REC
Energy technologies	PV production, electric energy storage, eV chargers, demand response

	Public parking: three canopies have been installed as central islands with the capacity to accommodate 14 cars under each of them.
Economic model and Financing	The cooperative provides the investment, installation, operation and maintenance by means of AaS (As a Service) formula. Obtained public subsidies. PV and mini hydraulic power. PV in roof and in land.

3. Energy Community Transition Offices (ECTOs) focus and set-up

3.1. Upper Austria

ESV operates an Energy Community OSS (one stop shop) since 2021 and is an active partner of the Austrian platform for Energy Communities in which the 9 regions cooperate within the national programme (developed with the Upstairs project).

It is planned to extend the existing OSS to the ECTO and put a focus on CECs. For further ECTO activities, the following main information needs are seen:

- general information on ECs (to attract new potential EC members)
- general and detailed info on CECs (as this is a new EC form, both, general and detailed information are needed)
- continuous information and awareness raising for energy sharing
- continuous training and upskilling of ECTO staff to be able to cope upcoming issues and changes in legal or regulatory issues and market conditions

In general, advice and support on regulatory, technical, financial, organisational aspects of developing and operating energy communities will be given.

Currently, the following key topics and most frequent questions are answered:

- regulatory framework: geographic boundaries; legal forms (association or cooperative); membership (how many and who); what is a REC allowed to do and what not
- financial aspects: funding programmes; tax questions
- technical and organisational aspects: grid connection/interaction with DSOs; load optimisation; accounting systems; service providers; what to do at which step

The Stakeholder Activation Campaign was kick-started at the annual tradeshow "Energiesparmesse" which took place from 6 to 10 March 2024 in Wels/Upper Austria with more than 81,000 visitors. ESV had a prominent exhibition stand featuring a special booth on ECs. This event presented also the launch of the ECTO.

Figure 2: Impressions of the stakeholder activation campaign in Upper Austria

For this event, an information folder was developed to give detailed but concise information on general aspects of ECs including CECs.

The highlight at the stand was an interactive quiz where visitors could test their general knowledge on ECs and learn by playing first. Questions from 8 categories were presented, offering 3 possible answers. More than 300 persons played the quiz, they were given a small present.

3.2. Bulgaria

As a first step, the Bulgarian ECTO will concentrate on electricity sharing. The ECTO service will be integrated into the Municipality of Gabrovo Regional Information Centre (RIG). As part of the network of 28 information centres established with the financial support of the Operational Program "Good Governance," co-financed by the European Union through the European Social Fund, the RIG presents an excellent opportunity for replicating and scaling successful models and practices, including the Bulgarian ECTO facility under the POWER-E-COM initiative.

The Centre has already gained experience by providing free and easy access to information across all social, ethnic, and age groups regarding European Union policies, the management and implementation of European Structural and Investment Funds, and the opportunities in Bulgaria for applying under the Operational Programs. It is a natural progression for the ECTO's portfolio of services to build upon RIG's competences.

Individuals interested in establishing energy communities can obtain information about financing opportunities under current grant procedures, as well as general and specific information about national and European strategic and programming documents, if available.

In addition to raising awareness and sharing information, the RIG will advise Energy Community (EC) members on the steps and professional services required to establish an EC, such as:

- Energy audits,
- Equipment installation,
- Legal services,
- Measurement and Verification / Metering,
- Operations and maintenance,
- Others.

A key advantage of the RIG is its team of experts, who are capable of organizing events tailored to the specific needs of ECTO beneficiaries in the region. They will be available to answer questions on the spot, by email, or phone. Visitors to the centre can access information materials, specific literature, and the Internet.

3.3. Germany

The ECTO (Energy Community Transition Office) in the region Bavarian Oberland will focus on heat sharing as well as electricity sharing for RECs.

Initially the main focus will be on heat sharing, as national regulations for electricity sharing are still missing. As soon as enabling frameworks and support schemes for RECs/CECs are established, generation, self-consumption and energy storage of renewable electricity will also come into focus. Furthermore, sector coupling e.g. electricity generation in combination with EV charging infrastructure and heat generation (e.g. by heat pumps) might also play a role.

The ECTO will be part of the existing infrastructure of the civic foundation Energiewende Oberland (EWO). EWO is the ideal base for the establishment of the ECTO and EWO will act as a service hub for all interested parties. The actions of EWO are targeted to informing citizens, politicians and decision makers about the opportunities of energy efficiency and renewable energy systems and actively support their implementation. EWO develops and runs educational programmes and serves as contact point and counsellor for municipalities, district governments, citizens and energy working groups.

As already approved in several other projects (e.g. the EU's Horizon 2020 funded project REPLACE, Figure 3), a website for Local Energy Communities (as subpage of the existing EWO Homepage) will be set up, to provide initial information on heat and electricity sharing. Different categories of training materials and project results will be made available to different stakeholders. For more detailed issues, that cannot be answered by the guidelines and information provided on the website, independent advice will be available through the EWO stuff.

According to the description of the POWER-E-COM project task the following services will be set up:

- Independent advice e.g. on business model design, financing
- Capacity building and training
- Support to local authorities and citizens in the creation and the extension of the LECs

Figure 3: Screenshot of the REPLACE subpage "Wärmewende" (www.waermewende-oberland.de)

3.1. Ireland

The Irish POWER-E-COM ECTO will be based in the already active Tipperary Energy Agency offices in Nenagh Co Tipperary and close by pioneer energy community offices in the same town, Community Power. It is envisaged that building on the knowledge within the Irish POWER-E-COM consortium, a dedicated development officer, supported by professional energy engineers in house at TEA will support, direct, animate, build the capacity of and interact with communities, stakeholders such as SEAI, local authorities, the Department of Environment, Climate and Communications, the DSO, other funders such as credit unions etc and become the public 'face' of the ECTO. The ECTO will almost certainly focus exclusively to begin with on wind and solar electricity generation for curious energy communities, expertly guiding them through the schemes available, with mentoring available from technical Tipperary Energy Agency staff, along with the support of partners TUS and Community Power.

The original group of energy communities who submitted letters of support to participate in POWER-E-COM, will become the first beneficiaries of the ECTO.

TEA already provide energy master planning (EMP) supports to SECs and Community Power and TEA also provide trusted intermediary services to energy communities, both initiatives funded through SEAI, so they are well placed to provide this additional ECTO service offering. To commence the ECTO, service will be soft launched, with web page on TEA website, a contact email address, phone number and social media presence.

3.2. Slovenia

ENERGAP is the Slovenian project partner of POWER-E-COM. The focus areas/topics of ENERGAP's ECTOs are the following:

1. Electricity Sharing within RECs and CECs: ENERGAP's ECTOs are primarily envisioned to concentrate on fostering electricity sharing through Renewable Energy Communities (RECs) and Community Energy Cooperatives (CECs). This focus area includes supporting the generation, distribution, and peer-to-peer sharing of electricity from renewable sources such as solar, wind, and hydro power within communities. The aim is to enhance local energy autonomy, reduce carbon emissions, and promote sustainable energy consumption patterns.
2. Heat Sharing Initiatives: Depending on the specific energy needs and resources available in the Podravje region, heat sharing could also be a significant focus. This may involve developing and supporting district heating projects powered by renewable energy sources, such as biomass, geothermal, or solar thermal energy. Heat sharing is particularly relevant in regions with significant heating demands, offering a path to increase energy efficiency and reduce fossil fuel dependence.
3. Integrated Approach: Ideally, ENERGAP's ECTOs would adopt an integrated approach, not limiting their focus to either electricity or heat but aiming to address the broader spectrum of community energy needs. This holistic perspective ensures that various energy demands - be it electricity, heating, or cooling are met through sustainable and community-driven solutions.

The embedment and operational set-up of the service is foreseen as following:

- Community-Centric Approach: ECTOs should be embedded within the communities they aim to serve, ensuring that initiatives are closely aligned with local needs, resources, and capabilities. This involves establishing ECTOs as accessible hubs within the community, fostering strong ties with local residents, businesses, and institutions.
- Collaborative Structure: The operational framework of ECTOs should be built on a foundation of collaboration among various stakeholders, including local authorities, energy providers, educational institutions, and community members. This collaborative approach will enable the pooling of resources, knowledge, and expertise, thereby enhancing the effectiveness and impact of community energy projects.
- Capacity Building and Support Services: ECTOs will function as centers for capacity building, offering a range of support services to assist communities in planning, implementing, and managing their energy projects. This includes providing expertise on technical, financial, legal, and administrative aspects, as well as offering training and workshops to build local skills and knowledge.
- Experience Sharing and Networking: A critical function of ECTOs will be to facilitate experience sharing and networking among energy communities. By creating platforms for dialogue, knowledge exchange, and collaborative learning, ECTOs can help replicate successful models, share innovative solutions, and collectively address challenges faced by community energy projects.
- Adaptive and Scalable Model: The set-up and operation of ECTOs should be adaptable and scalable, capable of evolving in response to changing energy landscapes, technological advancements, and community needs. This flexibility will ensure that ECTOs remain relevant and effective in supporting the dynamic field of community energy.

By focusing on these areas and adopting a community-centric, collaborative, and adaptable operational framework, ENERGAP's ECTOs can significantly contribute to the development and success of community energy projects in the Podravje region, aligning with broader goals of sustainability, energy independence, and climate resilience.

3.3. Spain

The main focus area of the POWER-E-COM ECTO in Spain is generation and self-consumption of renewable electricity for REC/CEC, and energy storage. There is a wide potential in supporting energy communities in installing solar PV systems, sometimes combined with other RES for electricity, energy storage, eV charging infrastructure or supporting aerothermal heat pumps.

Due to the experience of the staff in Escan, a second area of the ECTO interest would be the production and consumption of RES for heating and cooling.

Moreover, a typical way to attract end-users and groups of citizens to start their energy communities are the traditional barriers for citizens' and SMEs, as the understanding of their energy bills or simple energy efficiency questions. The ECTO will also use this factor to further support the office users and support them in their way to the energy transition and engagement with the energy market.

The ECTO services will be delivered by means of direct contact by telephone and a website with information on energy communities, PV self-consumption, other RES, eV and their infrastructure, energy efficiency and others.

More in detail, the ECTO will be designed to provide several of the following services, considering the description of the POWER-E-COM project tasks, which will be assessed and confirmed previously:

Independent advice:

- Renewables, energy efficiency, eV, storage, energy communities' management other
- Legal and contractual, both related to regulation and legal needs (as contracts)
- Financial: economic models, financing available for the energy communities and their projects, taxes reduction

Capacity building and training:

- Training aimed at energy communities setting-up
- Training aimed at energy communities' projects (as solar PV self-consumption)

Accompanying and support:

- Support in the process of design, setting-up and management of the energy communities and their projects.