Definition and Benefits of Energy Communities

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Introduction

Energy Communities are becoming more and more popular, since they provide one solution for the progress of smart energy transition.

In this Capacity Building Module, we **define Energy Communities**, unfolding the **different types**, the **similarities and differences** they share, as well as the **multiple benefits** they have to offer in the energy transition.

For who?

Videos are targeted to any stakeholder interested in energy communities:

- **Municipalities** supporting the creation of energy communities
- **Ministries** and **Public authorities** at local, regional and national levels
- **Energy agencies** and **Energy companies**
- **Local associations**
- **Investors** and **Renewable energy developers**
- **Consultants**
- **Citizens**

Energy Initiatives: Self-consumption and Energy Communities

New energy initiatives for individuals and communities

With the Clean Energy for all Europeans package European Commission introduced new provisions on the energy market design and frameworks for new energy initiatives. These include:

- **Collective self-consumption**
  - Constitutes a specific activity, not explicitly focusing on the organisational format.

- **Energy Communities**
  - Focus on organisational and market aspects.

Collective self-consumption

Collective self-consumption can be defined as **jointly acting renewables self-consumers.**

- A group of at least two cooperating “renewables self-consumers who are located in the same building or multi-apartment block”.

Currently some countries already **allow collective self-consumption** on:

- **Building scale - e.g.,** inhabitants of one multi-apartment building share produced renewable electricity. Also connected installations such as a storage system can be shared.
- **Block scale - e.g.,** area is enlarged to more than one building (including neighbouring buildings via direct lines) and correspondingly more actors are involved.

Working paper Collective self-consumption and energy communities: Overview of emerging regulatory approaches in Europe of Compile project.

Definition of Energy Communities

Definition and types of Energy Communities

An Energy Community is an organization of individuals, families, or local entities that collaborate to produce, consume, and manage energy in a sustainable way

European commission has two definitions of an energy community:

- **Renewable Energy Community (REC)**
- **Citizen Energy Community (CEC)**

Clean Energy for all Europeans package Rural Energy Community Advisory Hub

Differences between Citizen (CEC) and Renewable (REC) Energy Communities

	Citizen Energy Communities (CEC)	Renewable Energy Communities (REC)
Geographical scope	Not bound to a specific vicinity	Must operate in the vicinity of owned/developed renewable energy projects
Activities	Operate in the electricity sector, technology-neutral	Focus primarily on renewable energy-related activities
Participants	Any actor can participate	Restricted to natural persons, local authorities, and MSMEs*
Autonomy	Decision-making not limited based on economic activity	Autonomy maintained excluding large-scale commercial energy actors*
Effective control	No restrictions on control	Control by MSMEs in proximity to the renewable energy project**

* excluding large-scale commercial energy actors
** excluding medium and large enterprises

Understanding the types of Energy Communities

While both types of Energy Communities share similarities, they are not entirely identical.

The primary vision of Energy Communities is to self-organize around energy-related initiatives, aiming to deliver services or other socio-economic advantages to their members and/or the surrounding community.

Common characteristics of the two types of Energy Communities are:

- In both CEC and REC participation is **open and voluntary** to all legal entities.
- The **primary objective** of both types is to deliver **environmental, economic, or social community benefits** to their members, shareholders, or the local regions in which they operate, rather than to generate financial profits, rather than to generate financial profits.
- Effective control is vested in citizens, local authorities, and small businesses that aren't already engaged in the energy sector.

Possible activities of Citizen (CEC) and Renewable (REC) Energy Communities

Citizen Energy Communities (CEC)	Renewable Energy Communities (REC)
Electricity generation	RES generation
Energy efficiency services	Energy efficiency services (connected to RES supply)
E-mobility	E-mobility from RES
Supply	RES supply
Aggregation	RES aggregation
Community network/local energy system	RES sharing
Public grid	RES self-consumption
Other energy services	District heating and cooling (RES)
Sharing	
Self-consumption	

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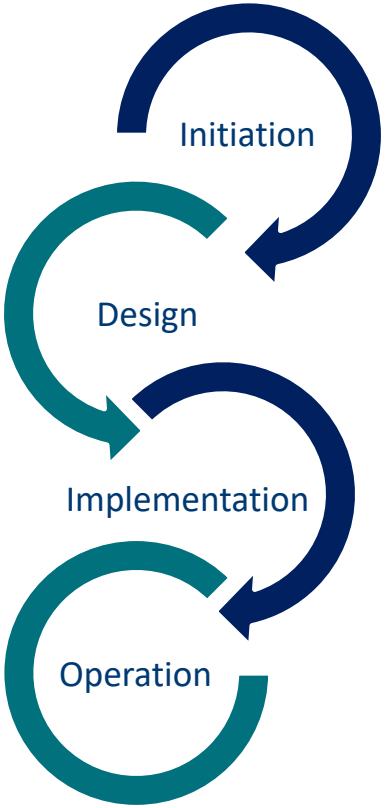
* RES: Renewable Energy Resources

Phases of setting up Energy Communities



The initial ideas about the Energy Community (goals, participants, expected activities, etc.) are set

The ideas and characteristics of the Energy Community get consolidated, a business plan is developed and a plan about the realization of the Energy Community is structured (about funding, land, partners, suppliers, infrastructure)

The Energy Community project is officially launched, its statutes and constitution is defined, and the infrastructure and technology is installed. The benefits of the community are now visible.

Focus on maintaining and improving the activities of the Energy Community, ensuring that there is good organization and management in place for that

Benefits of Energy Communities

Benefits of Energy Communities

Energy communities offer a wide range of benefits, rather than focusing on solely on the financial profit.

The benefits Energy Communities can offer can be **environmental, social,** and **economic.**

Environmental benefits

- **Greenhouse Gas Reduction**, promoting the use of renewable energy sources, reducing carbon emissions and mitigating climate change.
- **Resource Efficiency**, encouraging efficient energy use, minimizing waste, and optimizing resource consumption.
- **Ecosystem Protection**, reducing the environmental impact of energy generation.
- **Shift towards cleaner energy sources**, leading to improved air and water quality within the community.
- **Contribution to sustainable development**, ensuring a balance between environmental preservation and human well-being.

Social benefits

- **Community Empowerment**, involving citizens in local energy decisions.
- **Social cohesion**, fostering cooperation, collaboration, and a sense of community among members through shared energy goals.
- **Fair access to clean energy**, promoting social equity and inclusivity among diverse community members.
- **Knowledge sharing**, encouraging knowledge exchange, awareness, and education on energy matters within the community.
- **Enhancement of skills**, expertise, and capacity among community members, supporting sustainable development.

Economic benefits

- **Reduced individual costs for participants**, due to the collective procurement and sharing of energy resources.
- **Growth of local energy businesses and start-ups**, fostering entrepreneurship and economic development.
- **Attraction of private investments in the clean energy transition**, stimulating economic growth and job creation.
- **Revenue generation from energy sales and service provided by the community**, contributing to the local economy.
- **Value retention within the community** rather than flowing to external corporations.

Example of local benefits of an Energy Community

Energy communities help in developing local value-chains, jobs, and skills.

The Lyndoch residential community microgrid project, which interconnected over 30 homes via a tiered grid system was the first smart embedded residential rooftop microgrid in South Africa.

Green energy initiatives help to ensure the sustainability and longevity of projects. They also clearly demonstrate the value of enhancing citizen engagement in localised clean energy transitions.

Lyndoch Community

Flexibility of smart energy transition

Flexibility is key

Increased flexibility is a key technical property that has to be included in the solutions of smart energy transition. This is because smart energy transition:

- Increases weather-dependent production with constantly varying power.
- Decreases control power capacity due to run-down of fossil production.
- Decreases inertia of the grid leading to stability issues.

Consumers' flexibility is perceived as a promising way to balance the system.

- What does this mean for Energy Communities?
- What are the means for increasing flexibility in Energy Communities?

Flexibility is key

Interesting opportunity is that flexibility services may offer **significant possibilities to improve the financial view of an Energy Community**.

Members of Energy Community may get financial benefit for their flexible consumption of energy (demand-side flexibility).

Example solution of flexibility

In order to get familiar with flexibility possibilities of Energy Communities, the project **REScoopVPP** is also worth exploring.

The main aim of REScoopVPP is to set-up a community-driven virtual power plant that can actually provide **flexibility services to the grid** and contributes to a **100% share of renewable energy sources** into the grid.

The project aims to make existing buildings smarter from flexibility point of view. In addition, Energy Communities can organise themselves as aggregators or retailers of renewable energy.

Flexibility in a large-scale Energy Community

The **biggest and technically most advanced Energy Community in Finland** exist in the municipality of Lempäälä, Southern Finland.

This technically advanced Energy Community has very **flexible energy system** combining power grid and district heating network, and it includes **MW-scale energy storages** (electric and thermal), **MW-scale solar electricity system**, **high-temperature fuel cells** and **gas engines**.

This large-scale Energy Community offers flexibility to Finnish electric energy system by **taking part in power balance control of the national grid**.

Self-sufficient energy System LEMENE Microgrid

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