

Energy Communities

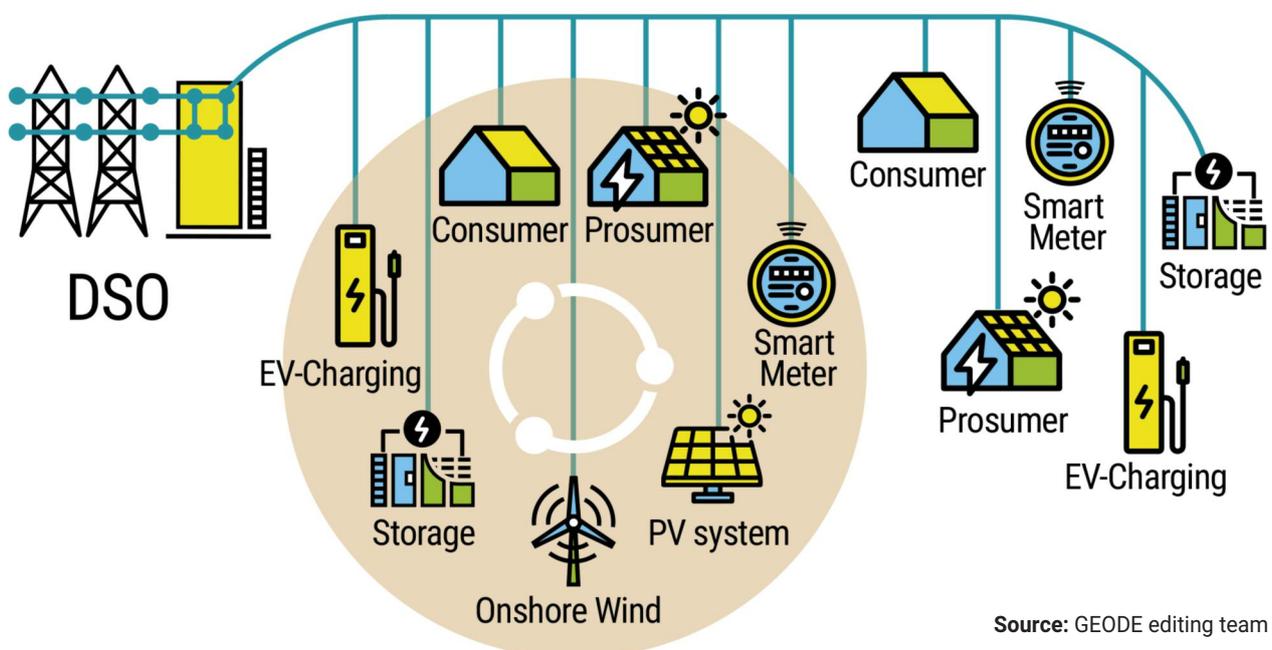


Introduction

Energy communities are a key player within the European Union’s idea for a future energy system working towards **decarbonisation, consumers’ participation and decentralisation**. The European Commission’s Clean Energy Package outlines the exceptional role prosumers¹ and their collective forms

will take in the future energy system. The EU legislative framework certifies and defines energy communities (EnCs) as ‘**renewable energy communities**’ (REC²) and ‘**citizen energy communities**’ (CEC³). For the purpose of this paper, we will refer to “energy communities” (EnCs) as an overall concept.

GEODE Model of an Energy Community



Source: GEODE editing team

¹ Producer and consumer of (renewable) energy.

² The revised Renewable Energy Directive (EU) 2018/2001 defines the legal framework for ‘renewable energy communities’ covering renewable energy only.

³ The revised Internal Electricity Market Directive (EU) 2019/944 sets new roles and responsibilities for ‘citizen energy communities’ in the energy system covering all types of electricity.

POLICY & REGULATORY REQUIREMENTS

Transposition of the European framework for energy communities into national legislation should take into consideration national energy and climate plans and the following:

Six key factors

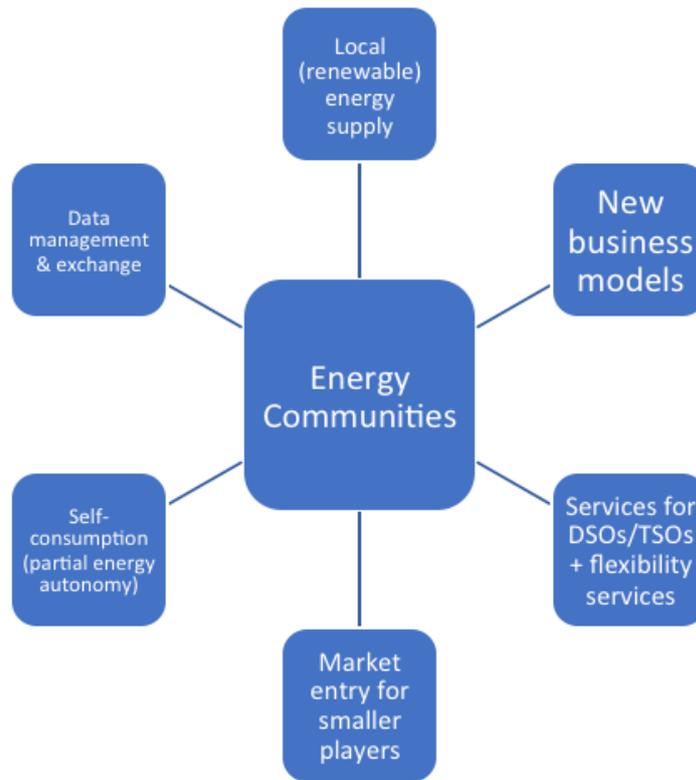
- **Renewable energy**
EnCs contribute to decarbonising the European energy system by enabling the integration of renewable energies as more consumers can be active and generate their own energy with renewable sources as well as new technologies, e.g., electric vehicles (EVs) into the existing grid.
- **Grid ownership and operation**
In order to avoid duplication of assets and ensure economic efficiency of the system, the ownership and operation of the grid should remain with the DSOs and their regulatory framework guaranteeing a reliable and high level of quality service.
- **Balancing and flexibility**
EnCs can be a key actor on the way towards decentralised, flexible and cost-efficient national/local energy markets. Strong cooperation with local DSOs in grid infrastructure, load management of the network and data transparency can help reduce system costs overall, and not just for the EnCs.
- **Network tariffs**
Where EnCs are connected to a wider DSO grid, network charges are to be applied at the connection point(s) such that they are cost reflective of the EnC's access, impact and usage of the DSO grid at all relevant connection points, in accordance with the relevant NRA rules.
- **Level playing field**
EnCs should have equal rights and responsibilities as any other market player. That means participants keep the right to choose a supplier of their choice (key principle of energy markets) independent of their "membership" in an EnC.
- **The business model and market design**
EnCs are focusing on local energy production and consumption but will still be reliant on selling into or buying energy from the existing grid under effective market price signals. Therefore, shared business models with DSOs can help to ensure the most cost-efficient management of the EnC.

What are Energy Communities?

Energy communities (EnCs) as a legal entity can cover different activities of the energy value chain such as **generation, distribution, supply, consumption aggregation, storage, energy efficiency services and charging services for electric vehicles**. Its shareholders or members can be involved in planning, establishing, producing, consuming and financial/commercial using and/or sharing of energy, including **electrical, thermal (heating) or fuel (biogas) energy**.

Beyond investment opportunities, EnCs can offer solutions to future energy markets like providing **local and sustainable energy supply, self-consumption and local storage**, partial energy autonomy, flexibility services to **TSOs and DSOs** and enabling citizens to be an active part of shaping Europe's future energy system. EnCs are allowed to take different organisational forms (association, cooperative and others) through a legal entity (RED II and IEMD).

Figure: Energy communities' possible future services.



Source: GEODE editing team

Possible Roles for Energy Communities and DSOs

According to the Internal Electricity Market Directive (EU) **2019/944**, distribution system operators (DSOs) are encouraged to cooperate with EnCs to **facilitate**

electricity transfers within EnCs and in between the local grid operator/distributor. In return, the Directive grants fair compensation to the DSO (Art. 16.1 d).

ROLES	
Energy Communities (EnCs)	Distribution System Operators (DSOs)
<ul style="list-style-type: none"> EnCs will facilitate the development of decentralised energy production, distributed energy resources, aggregation and self-consumption. EnCs help to integrate renewable energy sources and new technologies into a transforming energy system. EnCs can boost social innovation by letting customers participate and support the energy transition, enabling consumers to become prosumers. 	<ul style="list-style-type: none"> DSOs are active neutral market facilitators for many customers' needs, such as flexibility, services in demand response, meter data management, energy storage and enabling the production from distributed energy resources. DSOs own and operate distribution grids in a cost-efficient manner, ensuring equal treatment to all customers. DSOs also enable EnCs from the technical side and guarantee a reliable and efficient grid operation ("full-DSO-service").

Grid Operation and Network Tariffs

GRIDS – OWNERSHIP AND OPERATION

DSO/Grid

Owning and operating distribution grids with open and regulated neutral market access is a key role of DSOs. They have **long-time experience** in cost-efficient grid management and operation and **integration of different grid users**. Therefore, it is the easiest **solution for EnCs** to use (like any other user) the DSOs' grid and fully concentrate on customer needs.

EnC/Grid

If EnCs are granted the right to build up and operate a distribution grid within a limited area by member states:

1. The same regulatory framework with responsibilities, and obligations as for current DSOs (**grid licence/authorisation, access to the grid, electricity and service quality, outage management, metering, maintenance, connecting, billing and licensing**) should apply.
2. The **duplication of networks** should be avoided and not be considered an economically efficient solution for the energy system.

NETWORK TARIFFS AND GRID COSTS

Where EnCs are connected to the relevant DSO grid, network charges are to be applied **at the connection point(s) such that they are cost reflective of the EnC's access, impact and usage of the DSO grid at all relevant connection points, in accordance with the relevant NRA rules.**

Technical and Economic Barriers

A series of barriers on the technical as well as on the economical side should be considered when implementing EnCs and integrating them into the energy system:

- Technically, the integration of emerging EnCs will **challenge the coordination** of various levels and scales of the energy system (metering, data, market processes, energy distribution of fix or even variable hourly coefficients, etc.).
- EnCs and their local concentration can offer flexibility but with no technical coordination on a larger scale, meaning the energy system can lack **security of energy supply, system stability, balancing/load management or data security**. Coordination regarding local network issues should be processed by DSOs.
- **Financial/economic:** Investors or EnCs might face economic uncertainties, difficulties in **accessing expert knowledge** or lack of steady motivation or voluntary dedication from its EnC members. Cooperation with DSOs can facilitate the integration of self-consumption and flexibility provided by the EnCs in the existing energy system.