Sustainable business model of energy communities and their role in accelerating (energy) transition
Introduction

The revised Renewable Energy Directive EU/2023/2413 raises the EU’s binding renewable target for 2030 to a minimum of 42.5% (up from the previous 32% target) with the aspiration to reach 45%.

The Clean Energy Package shows the role of energy communities with 2030 targets in:
- Greenhouse gas emissions,
- Renewable energy production
- Energy efficiency

Citizens should be involved in energy consumption, generation, trading and supply for reaching such targets and energy transition.

Renewable Energy Communities: they are one of the key elements for achieving the EU’s energy transition; half of Europe’s citizens could be producing up to half of the EU’s renewable energy by 2050.
Renewable Energy Communities

Internal Electricity market Directive: IEMD, 2019:

A **legal entity** that, in accordance with the applicable national law, is based on **open and voluntary participation**, **autonomous**, effectively controlled by **shareholders or members** that are located in the **proximity of the renewable energy projects** that are owned and developed by that **legal entity**; the shareholders or members of which are **natural persons**, **SMEs** or **local authorities**, including municipalities.
Renewable Energy Communities

- Keep money in the local economy
- Foster social acceptance for renewable energy
- Keep individual investment affordable
- Lower energy bills
- Benefit the local community
- Take action on energy
Key Aspects

- The main objective of a Renewable Energy Community is to provide environmental, economic, and social benefits to its members or shareholders and the local areas in which it operates through the self-consumption of renewable energy.

- They are a tool capable of significantly contributing to the spread of renewable energy installations, the reduction of greenhouse gas emissions, and the energy independence of a place (e.g., a region, a country).

- Large enterprises cannot be members of a Renewable Energy Community, but they can be part of a group of renewable self-consumers.
Key Aspects: establishment

Firstly, it is necessary to identify the areas where to implement installations powered by renewable sources and the users to associate with and share electrical energy.

Next, it is essential to legally establish the Renewable Energy Community in the form of an association, third-sector entity, cooperative, benefit cooperative, consortium, nonprofit organization, etc. In other words, the Renewable Energy Community needs to be endowed with its legal autonomy through any form ensuring compliance with its main constitutive objectives. Each Renewable Energy Community is, therefore, characterized by articles of incorporation and bylaws.

The membership of an energy consumer or a renewable energy producer in the Renewable Energy Community can occur during the legal establishment phase or in a subsequent phase, according to the modalities provided in the acts and bylaws of the Renewable Energy Community itself.
Key Aspects: participants

It is a community that brings together producers from renewable sources and energy consumers. It is therefore possible to participate in the capacity of:

- **Renewable energy producer**: an entity that implements a renewable energy generation system, such as a photovoltaic installation.
- **Self-consumer of renewable energy**: an entity that owns a renewable energy production system and generates energy to meet its own consumption needs, sharing excess energy with the rest of the community.
- **Electricity consumer**: an entity that does not own any energy production system but has its own electric utility, with consumption partially covered by the renewable electricity produced by other members of the community. This category also includes so-called 'Vulnerable' customers and low-income families.
Key Aspects: dynamics

All participants in the Renewable Energy Community, whether they are final consumers of electrical energy or self-consumers (meaning consumers who own a renewable energy production system and generate energy for themselves and for the members of the Renewable Energy Community), retain their rights as final customers. This includes the right to choose an electricity supplier, and they have the option to leave the community whenever they wish, in accordance with the rules and guidelines outlined in the bylaws. The same rights of entry and exit are also guaranteed to renewable energy producers.
Key Aspects: geography

All consumers and producers must be located in the geographical area where the connection points to the national electrical grid (POD) are serviced by the same primary electrical substation.

On the GSE website, there is an interactive map of primary electrical substations across the national territory. [https://www.gse.it/servizi-per-te/autoconsumo/mappa-interattiva-delle-cabine-primarie](https://www.gse.it/servizi-per-te/autoconsumo/mappa-interattiva-delle-cabine-primarie)

Through the map, it is possible to:

- Obtain graphical information, based on geolocation, about the area served by a specific primary substation.
- Verify the code of the primary substation for a particular geographical location identified by address and postal code.
Key Aspects: incentives

For all Renewable Energy Communities, incentives on self-consumed energy are provided in two different forms:

- An incentivizing tariff on energy produced from Renewable Energy Sources and virtually self-consumed by members. This tariff, recognized by the GSE – the Italian Energy Service Operator (which also handles the calculation of virtually self-consumed energy), is applicable for a period of 20 years from the start-up date of each FER facility. The tariff ranges between €60/MWh and €120/MWh, depending on the size of the facility and the market value of energy. For photovoltaic installations, an additional bonus of up to €10/MWh is provided based on the geographical location.

- A compensation for the valorization of self-consumed energy, defined by ARERA – the Regulatory Authority for Energy, Networks, and the Environment. This compensation amounts to approximately €8/MWh.
Key Aspects: incentives

Moreover, all renewable electric energy produced but not self-consumed remains available to producers and is valued at market conditions. Producers can request access to the economic conditions of dedicated withdrawal from the GSE for this energy.

Finally, for CERs whose production facilities are located in municipalities with a population of fewer than 5,000 inhabitants, a capital contribution is provided, amounting to 40% of the investment cost, funded through the resources of the National Recovery and Resilience Plan (PNRR).
Italian Renewable Energy Communities

Source: Legambiente database (2023)
- What is a possible sustainable business model of renewable energy communities?
Osterwalder and Pigneur (2010) proposed the **Business Model Canvas** to describe how organizations can create, deliver and capture (economic) value.

Later, Joyce and Paquin (2016) proposed the **Triple Layered Business Model Canvas** (adding the social and environmental layers) for exploring sustainability-oriented business model innovation.
It builds on a stakeholder management approach.

It builds on a life cycle perspective.
# A sustainable business model of energy communities

<table>
<thead>
<tr>
<th>Partners, local community, supplies and outsourcing:</th>
<th>Activities, governance, production: renewable energy generation and supply; community building; system creation and maintaining; IT infrastructure; logistics; [often cooperatives].</th>
<th>Value proposition, social value, functional value: energy transition; social transition; technological change; economic development.</th>
<th>Customer relationships, end of life, societal culture: personal and direct contacts; social innovation.</th>
<th>Customer segments, use phase, end users: prosumers; households; firms (e.g., SMEs); public entities; maintenance of the system.</th>
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<tbody>
<tr>
<td>community members; social relationships; technical and technology providers; local utility companies; external investors; public entities; distribution systems operators; networking agents.</td>
<td>community members; prosumers; fundings from private/public investors; regulatory framework; building infrastructures; information technology; networking skills (aggregators) and programs.</td>
<td>community engagement; community members’ shares; sales to other consumers; sales of energy surplus; fundings by public and private agents; environmental impact reduction; regenerative positive ecological value; formation of social capital and environmental benign lifestyle; socio-economic regeneration of places and empowerment of citizens.</td>
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<td>Resources, employees, materials:</td>
<td>Channels, distribution, scale of outreach: direct (e.g., face-to-face) and indirect (e.g., digital, written) channels; support platforms; energy distributors and logistics; local and global outreach.</td>
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<td>Cost structure, environmental impacts, social impacts: ex-ante feasibility studies; planning; licensing; assets supply and installing; public grid connection; transactions with external entities; system maintaining and training.</td>
<td>Revenue stream, environmental benefits, social benefits: community engagement; community members’ shares; sales to other consumers; sales of energy surplus; fundings by public and private agents; environmental impact reduction; regenerative positive ecological value; formation of social capital and environmental benign lifestyle; socio-economic regeneration of places and empowerment of citizens.</td>
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<td>Energy transition:</td>
<td>Social transition:</td>
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| energy efficiency with local renewable energy production and consumption; independence from traditional energy production system and grid; independence from energy crisis and price fluctuation in the energy sector. | - individual level: inclusion and better living conditions for vulnerable, low income, and at risk of poverty households.  
- local level: social innovation and socio-economic regeneration of places (urban/rural) and empowerment of citizens (“voice”); formation of social capital and environmental benign lifestyle. |
| Technological change: | Economic development: |
| development of new clean energy technologies and platforms; development of devices for operational compatibility and communication among different involved agents; technological transition to a decentralized electricity system. | - Individual level: savings in energy bills and new job opportunities.  
- local level: socio-economic development mainly by new job creation and entrepreneurial opportunities. |