

Energia e sostenibilità nel XXI secolo, 19 Marzo 2024



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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.



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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>

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.



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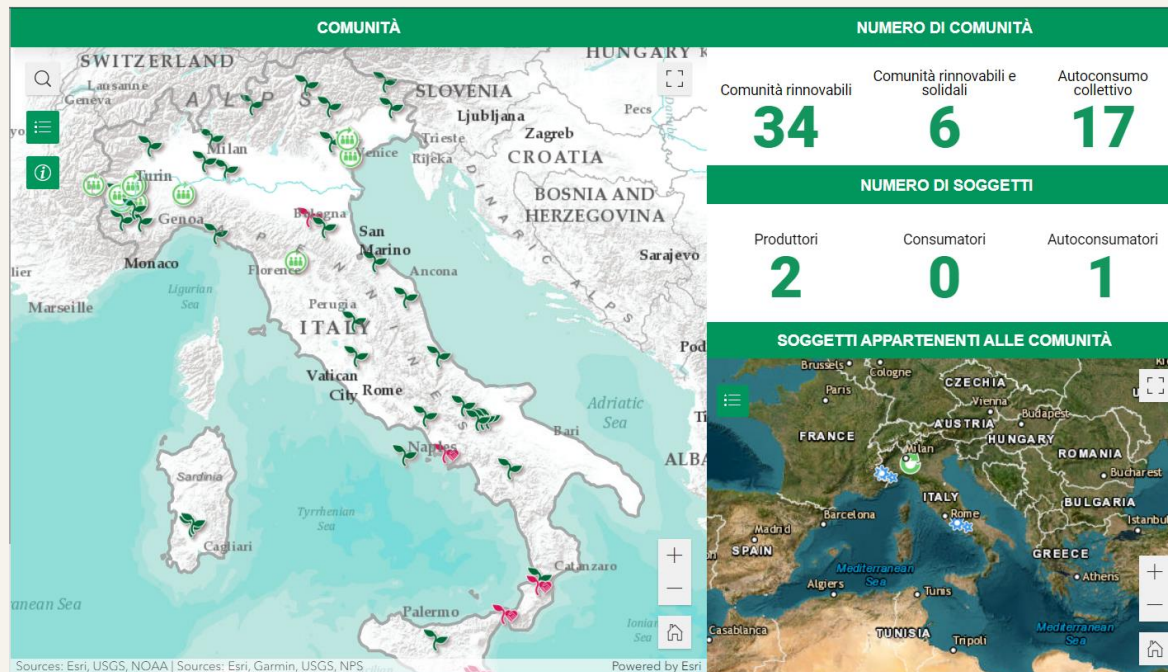


Key Aspects: incentives

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)



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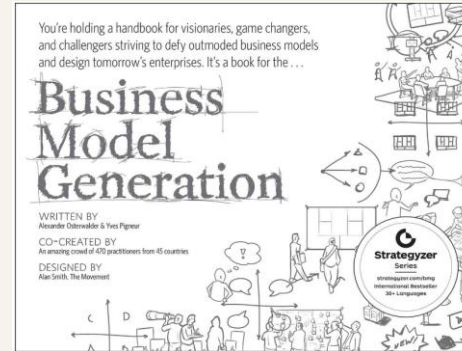
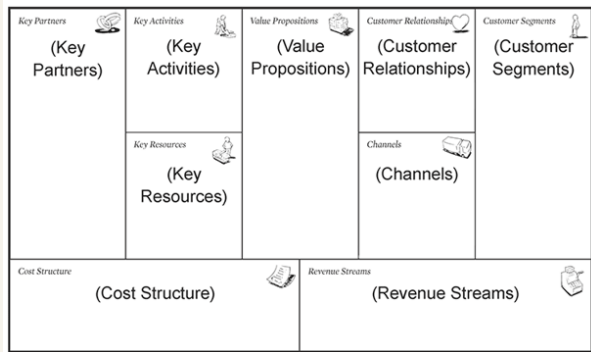


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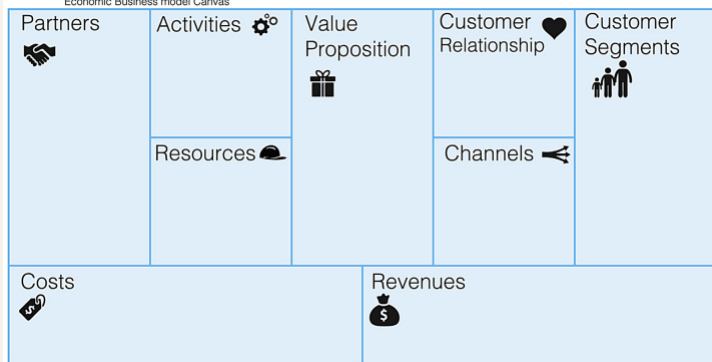
- What is a possible sustainable business model of renewable energy communities?

Osterwalder and Pigneur (2010) proposed the **Business Model Canvas** to describe how organizations can create, deliver and capture (economic) value.

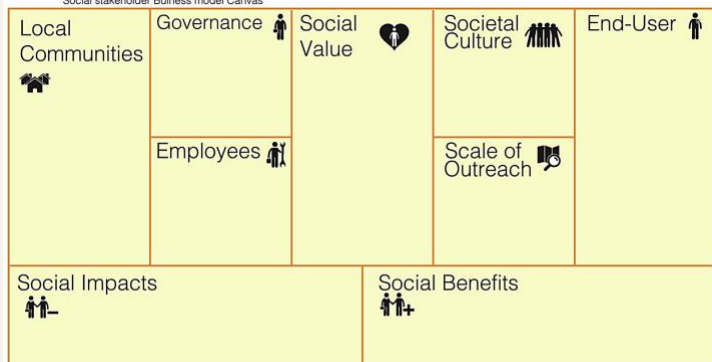


Later, Joyce and Paquin (2016) proposed the **Triple Layered Business Model Canvas** (adding the social and environmental layers) for exploring sustainability-oriented business model innovation.

Economic Business model Canvas



Social stakeholder Business model Canvas



It builds on a stakeholder management approach

Contents lists available at [ScienceDirect](https://www.sciencedirect.com)

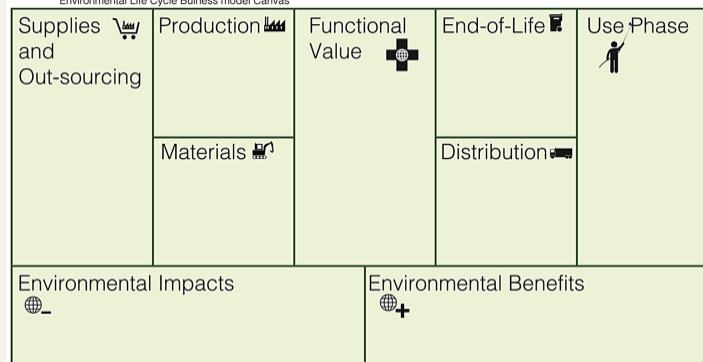
Journal of Cleaner Production

journal homepage: www.elsevier.com/locate/jclepro

The triple layered business model canvas: A tool to design more sustainable business models

Alexandre Joyce ^{a, *}, Raymond L. Paquin ^b

Environmental Life Cycle Business model Canvas



It builds on a life cycle perspective

A sustainable business model of energy communities

<p>Partners, local community, supplies and outsourcing: community members; social relationships; technical and technology providers; local utility companies; external investors; public entities; distribution systems operators; networking agents.</p>	<p>Activities, governance, production: renewable energy generation and supply; community building; system creation and maintaining; IT infrastructure; logistics; [often cooperatives].</p>	<p>Value proposition, social value, functional value: energy transition; social transition; technological change; economic development.</p>	<p>Customer relationships, end of life, societal culture: personal and direct contacts; social innovation.</p>	<p>Customer segments, use phase, end users: <u>prosumers</u>; households; firms (e.g., SMEs); public entities; maintenance of the system.</p>
<p>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.</p>	<p>Resources, employees, materials: community members; <u>prosumers</u>; fundings from private/public investors; regulatory framework; building infrastructures; information technology; networking skills (aggregators) and programs.</p>		<p>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.</p>	
			<p>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.</p>	



Energy communities and transitions

Energy transition:

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.

Social transition:

- 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:

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.

Economic development:

- Individual level: savings in energy bills and new job opportunities.
- local level: socio-economic development mainly by new job creation and entrepreneurial opportunities.



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