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Definition and applications of a Renewable Energy Community (REC)

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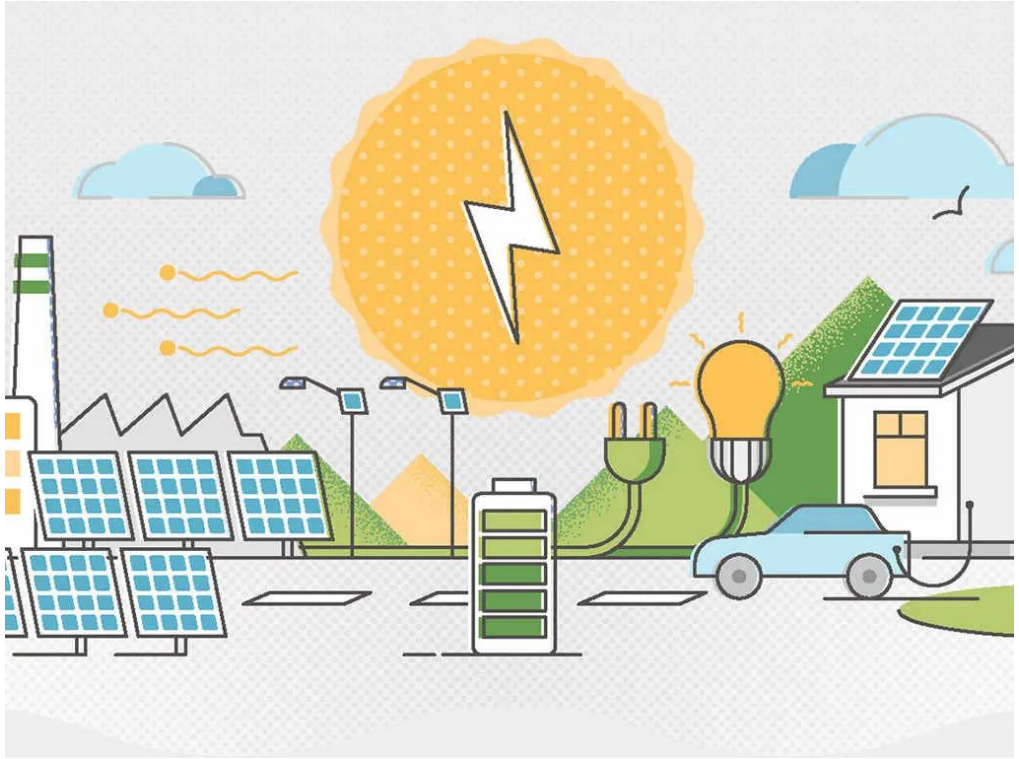
Content

- Definition and applications of a Renewable Energy Community (REC)
- European regulatory framework for RECs

What is a REC?

- Associations of citizens, businesses, local governments, or small and medium-sized enterprises sharing their renewable energy production for self-consumption.

- RECs are considered the key elements to shifting the energy production/consumption concept, i.e. moving from a centralised energy production to a distributed one.



Benefits of a REC?

- **ECONOMIC:** feed-in tariffs provided by the Ministry of the Environment (MASE) based on shared energy within the REC.

- **ENVIRONMENTAL:** reduction of polluting emissions using renewable sources that produce clean energy locally.

- **SOCIAL:** fight against energy poverty that currently exists in some remote and rural areas.

Principles of RECs

- **Voluntary Participation**: Any individual or entity can join or leave the REC freely.
- **Local Control**: Decisions are made by community members who prioritize local energy needs.
- **Non-Profit Nature**: Revenues are reinvested in community services, energy projects, or shared among the REC's members.
- **Focus on renewables**: Promotes renewable energy technologies such as PV, wind, hydropower, etc.

EU Regulatory Framework for RECs

- Italy has currently transposed the EU Directive 2018/2001 (RED DIRECTIVE II), published in the Gazette on 21/12/2018, through Legislative Decree 08/11/2021 no. 199 “Implementation of Directive (EU) 2018/2001 of the European Parliament and of the Council of 11 December 2018 on the promotion of the use of energy from renewable sources”.

- On 31/10/2023, EU Directive 2023/2413 (RED DIRECTIVE III) amending Directive 2018/2001 was published. Entered into force on 20/11/2023, it must be transposed by 21/05/2025.

Renewable Energy Directive EU

Main differences between the Directives

	RED II	RED III
The share of energy from renewables in the EU's gross final energy consumption by 2030 shall be	**32 %**	**42.5% *(up to 45%)***
The share of energy from renewables in the transport sector by 2030 shall be	**14%**	**29%**

Renewable Energy Directive EU

The rules contained within the RED II Directive are functional:

- **Financial support** for the electricity produced by renewables (Articles 4-6 and 13).
- **Self-consumption** of electricity from renewables (Articles 21 and 22).
- Use of **energy from renewables**, also in the heating and cooling sector and the transport one (Articles 23-24 and 25-28).
- **Cooperation** between Member States and third countries on electricity production from renewables (Articles 9-12 and 14).
- **Guarantee the origin** of energy from renewables (Article 19) and administrative procedures for production, information, and training on renewables.

Overcoming Obstacles for RECs in Europe

Regulatory Challenges

- **Complex Permitting Processes**: In many countries, local and national regulatory frameworks are not yet fully aligned with the new EU directives concerning RECs: this results in lengthy and complicated permitting processes for renewable energy projects.

- **Lack of Clear Guidelines**: While the EU provides a framework, many member states have still to develop clear guidelines or procedures for the establishment of RECs; this leads to uncertainty and slows the implementation at the local level.

- **Bureaucratic Delays**: The bureaucratic processes required to register RECs and ensure their legal recognition are often slow, preventing many communities from accessing the benefits of RECs promptly.

Overcoming Obstacles for RECs in Europe

Financial Barriers

- **Limited Access to Funding**: Smaller communities and local energy groups often lack financial resources to develop renewable energy infrastructure. While EU funds and programs are available, their access can be challenging due to complex application processes, competition, and the need for substantial initial investment.

- **High Upfront Capital Costs**: Developing renewable energy infrastructure, such as solar or wind farms, requires significant upfront capital, which a few communities and businesses find difficult to start.

- **Uncertainty in Financial Support**: While there are EU programs like Horizon Europe or national funds available for RECs development, there is often uncertainty regarding long-term financial support. This instability discourages investment in the long-term development of renewable energy projects.

Overcoming Obstacles for RECs in Europe

Technical Barriers

- **Grid Integration Issues**: Integrating decentralized energy systems into the existing energy grid remains a major challenge. Many local grids are outdated and not equipped to handle the variability and decentralized nature of renewable energy generation. RECs face difficulties when trying to connect to national grids, especially in rural or isolated areas.

- **Balancing Supply and Demand**: RECs typically rely on intermittent renewable energy sources (e.g., solar and wind), which can create challenges in balancing/supplying the energy demand. Energy storage systems and smart grid technology are still in the early stages of development, making it difficult for communities to ensure a reliable and stable energy supply.

- **Technical Expertise**: Communities may lack the technical expertise needed to design, implement, and maintain renewable energy systems. This can result in an inefficient use of resources or operational failures, hindering the success of RECs.

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How the EU Supports RECs:

Funding programs:

- Horizon Europe: Grants for REC projects.
- Just Transition Fund: Support for local energy transition.

Technical assistance:

- European Energy Agency resources.
- Best practices database.

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Thanks for your attention!
Q&As?

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Expected goals to be achieved with RECs deployment

Alice Corovessi, Managing Director INZEB
Country Coordinator for Greece for the EU Climate Pact

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Renewable Energy Communities (RECs)

Renewable Energy Communities (RECs) are legal entities enabling citizens, small businesses, and local authorities to jointly own, manage, and benefit from renewable energy projects, as defined under the **EU Renewable Energy Directive** (**RED II, 2018/2001**).

RECs emphasise community-driven energy solutions where members **generate, consume, and share renewable energy locally**, reducing dependence on centralised energy systems.

RECs significance lies in their ability to:

> Accelerate the energy transition through localised renewable energy production.
> Empower citizens to participate actively in energy markets.
> Democratise energy systems, fostering local ownership, autonomy, and engagement.

RECs address **social**, **economic**, and **environmental** challenges, positioning communities as key drivers of the clean energy revolution.

✅ Local ownership and citizen empowerment ✅ Decentralised and resilient energy systems ✅ Increased access to clean, affordable energy.

Reference: *European Commission, RED II Directive 2018/2001*

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Goal 1: Promoting Energy Transition and Climate Goals

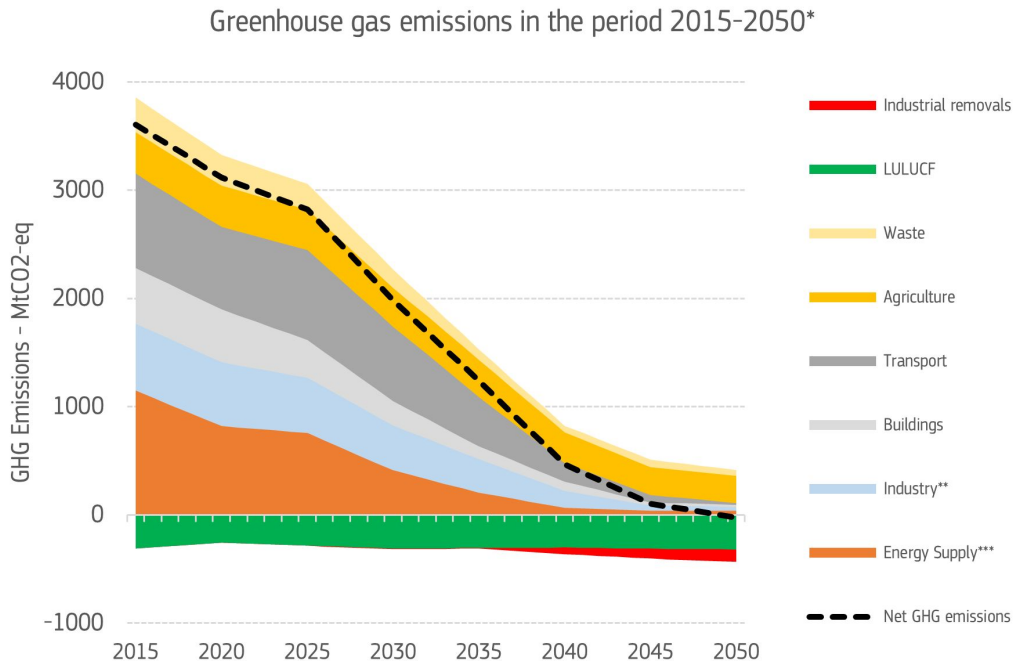
RECs play a pivotal role in achieving the EU's ambitious **climate neutrality goals** by 2050*, as outlined in the European Green Deal.

- **RECs** can significantly reduce reliance on fossil fuels, a major contributor to greenhouse gas emissions.
- **RECs** can contribute to the EU target of **55% emission reduction by 2030**.
- **RECs** can enhance **local resilience** against energy supply disruptions.

The deployment of RECs supports **regional climate goals** while fostering ***innovation*** and ***clean energy solutions***.

The ***collective efforts of citizens and local authorities*** amplify the positive environmental impact, bridging the gap between policies and actionable change.

Reference: *European Green Deal (2019)*



Source: PRIMES, GAINS, GLOBIOM
***Excluding non-BECCS industrial removals*
****Including Bioenergy with carbon capture and storage (BECCS)*

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Goal 2: Local Energy Production & Consumption (Energy Autonomy)

RECs empower communities to achieve **local energy autonomy**, reducing dependence on external energy imports and centralised grids. Thus, by locally generating, storing, and distributing renewable energy, RECs provide a **reliable** and **affordable** energy supply.

Key benefits include:

Energy Security: Local production ensures energy availability during geopolitical or economic disruptions.
Flexibility: RECs adapt to rural and urban contexts, addressing regional energy needs.
Resilience: Integration of storage solutions and smart technologies enhances grid stability.

Case Study: Samsø: An Island Community Pointing to the Future | Denmark

Reference: *IRENA Report on Energy Communities (2021)*

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Goal 2: Local Energy Production & Consumption (Energy Autonomy)

Case Study: Samsø: An Island Community Pointing to the Future | Denmark

Denmark's municipality of the **island of Samsø** has completely transformed its energy system **from fossil fuels to renewable energy**, becoming the **world's first renewable energy island**.

Key results that have been achieved include:

- ❑ becoming carbon negative;
- ❑ 100% local ownership of renewable energy investments;
- ❑ significant socio-economic benefits from the energy transition.

Reference: *https://unfccc.int/climate-action/un-global-climate-action-awards/climate-leaders/samso*

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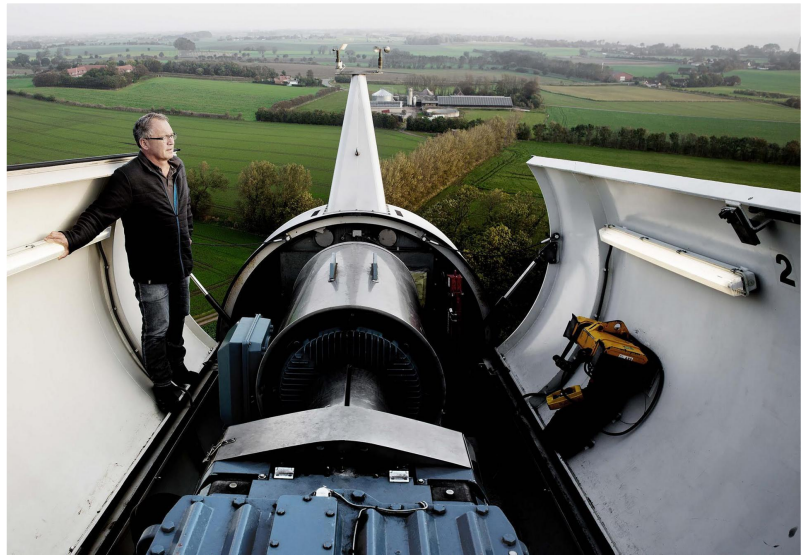


KEY FACTS

- Samsø has already achieved its goal of reducing annual **CO_2** emissions close to zero, **effectively becoming carbon neutral**. This was done through a series of renewable energy investments, namely 11 on-shore and 10 off-shore wind turbines, 4 local biomass-fuelled district heating plants, solar panels, and electric vehicles, enabling Samsø to reach a 100% net annual balance of renewable energy.
- Samsø has renewed its ambition and aims to become completely carbon-free by 2030. This means that no fossil fuel will be used, and all the island's energy needs will be covered by renewable energy. This is far ahead of the national ambition in Denmark for 2030 and the EU climate goals for the same year.
- To become carbon-free by 2030, the island community will extend the use of renewable electricity in the heating and road transport sectors and substitute fossil fuels in sea transportation with locally produced biogas or electricity.

Reference: *https://unfccc.int/climate-action/un-global-climate-action-awards/climate-leaders/samso*

Goal 3: Economic Benefits and Job Creation

The establishment of RECs generates significant **economic opportunities** at the local level:

1. **Job Creation**: Roles in renewable energy infrastructure, installation, operation, and maintenance.
2. **Cost Savings**: Community members benefit from shared resources and reduced energy bills.
3. **Local Investment**: Energy revenues stay within the community, fostering local economic growth.

Additionally, RECs attract investment in clean energy technologies, empowering SMEs and supporting **sustainable rural and urban economies**.

Goal 4: Alleviating Energy Poverty

Energy Poverty remains a pressing issue in Europe, affecting millions. RECs provide solutions by:

- ❑ Offering **affordable energy** to vulnerable households through collective purchasing and energy sharing.
- ❑ Reducing energy costs through locally generated renewable energy.
- ❑ Ensuring stable energy access, especially in underserved areas.

EXAMPLES

ENERGY COMMUNITY IN RUBÍ, BARCELONA

This project, driven by the local city council, allows citizens **to share the energy generated through municipal photovoltaic installations.** The initiative **covers up to 35% of its participants' electricity consumption**.

SOM ENERGIA, A PIONEERING COOPERATIVE

Since its founding, this cooperative has supported thousands of people in Spain in producing and consuming 100% renewable energy. Its focus includes collaborative photovoltaic and wind projects.

SOLAR NEIGHBORHOOD OF ZARAGOZA

An energy community that unites neighbours and small businesses **to share the energy generated by solar panels installed in public buildings,** thus reducing energy costs and promoting social cohesion.

Reference: *https://nordy.es/en/market-news/the-future-of-energy-communities*

Goal 5: Strengthening Local Communities and Social Cohesion

RECs are more than energy solutions—they strengthen the social fabric by fostering:

- **Collective Ownership:** Citizens co-own energy assets, fostering shared responsibility.
- **Trust and Cooperation:** Local collaboration builds more substantial, connected communities.
- **Awareness:** Engagement in sustainable energy projects raises environmental consciousness.

Image Source: *https://energy.ec.europa.eu/topics/markets-and-consumers/energy-consumers-and-prosumers/energy-communities_en*

Goal 6: Integrating Innovation and Smart Technologies

RECs embrace cutting-edge technologies to optimise energy efficiency and management, including:

Smart Grids: Enable seamless energy distribution and consumption monitoring.
Energy Storage Solutions: Battery storage ensures energy availability during peak demand.
Peer-to-Peer Trading Platforms: Citizens can trade surplus energy within the REC network.

Integrating digital tools enhances energy systems' flexibility and reliability, enabling energy exchanges between urban and rural areas.

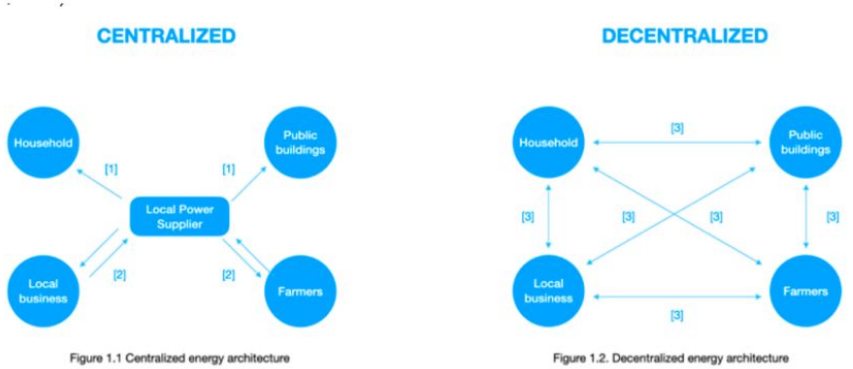


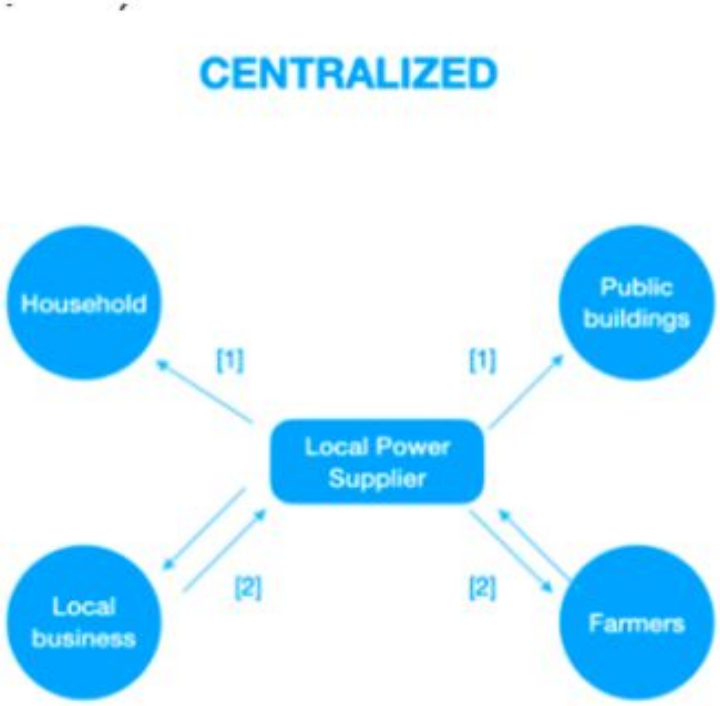
Figure 1.1 Centralized energy architecture

Figure 1.2. Decentralized energy architecture

P2P Energy Trading works through the utilisation of an energy trading platform. It uses a business model that enables prosumers (individuals producing and consuming electricity) to trade their electricity surplus with other peers. It decentralises the energy transactions as this is done from one peer directly to another peer, without passing through the centralised local power supplier,

Image Source: *Difference between a centralised and decentralised energy ecosystem (Ylla, 2023)*

Goal 6: Integrating Innovation and Smart Technologies



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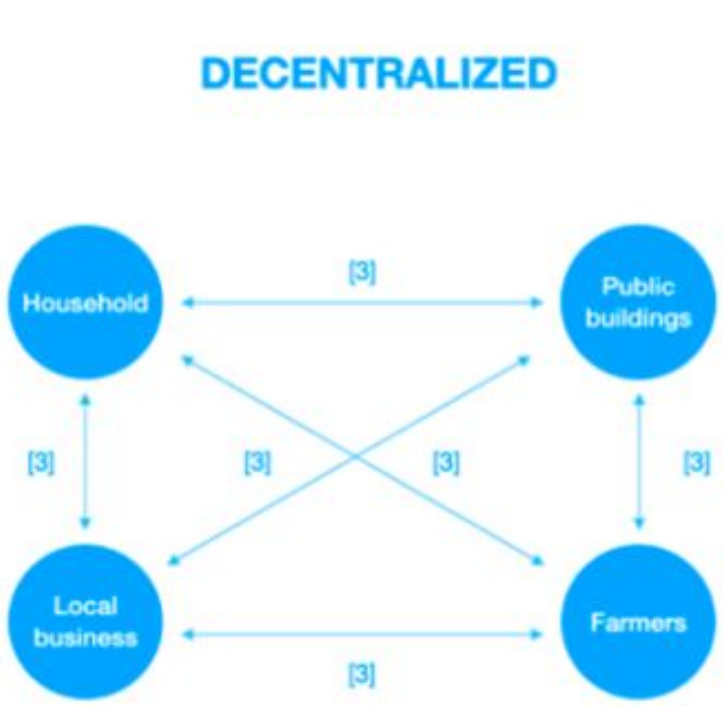

Figure 1.2. Decentralized energy architecture

Image Source: *Difference between a centralised and decentralised energy ecosystem (Ylla, 2023)*

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Key Takeaways

RECs are a transformative solution for achieving:

- Climate Neutrality and Reduced Emissions.
- Local Energy Independence and Resilience.
- Economic Opportunities and Job Creation.
- Energy Poverty Alleviation.
- Stronger, more Cohesive Communities.
- Adoption of Innovative Technologies.
- Scalable, Replicable Energy Solutions.

"Renewable Energy Communities are not just a tool for the energy transition—they are the heart of a citizen-driven, sustainable, and equitable energy future."

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