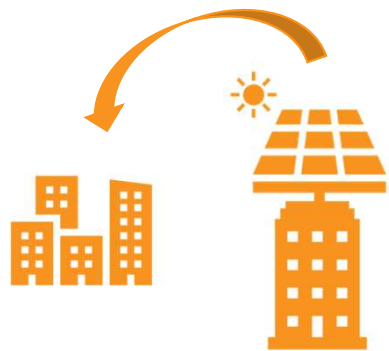


Energy communities and Digitalization



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What are energy communities



Both REC (Renewable Energy Community) and CEC (Citizen Energy Community) are legal entities



Open and voluntary participation following the regulation of the legal form in the own country



Autonomous and effectively controlled by the partners or members.



Their objectives are to offer environmental, economic and social benefits, not focused on providing financial benefits.



They can be constituted by citizens, local authorities or small/medium sized companies for REC and only small companies for CEC.



Renewable Energy Community (REC): they are associated to renewable energy projects on their vicinity.



Citizen Energy Community (CEC): Besides renewable energy projects, they also can participate in energy distribution, storage and other energy services like electric vehicle charging points, energy efficiency or demand side management.



Who can participate?



Partners or members controlling the EC should be natural persons, SMEs/Small or local authorities

Others can participate with agreements, providing with roofs, external experts, etc.



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What legal forms are typically used?



Association



Cooperative

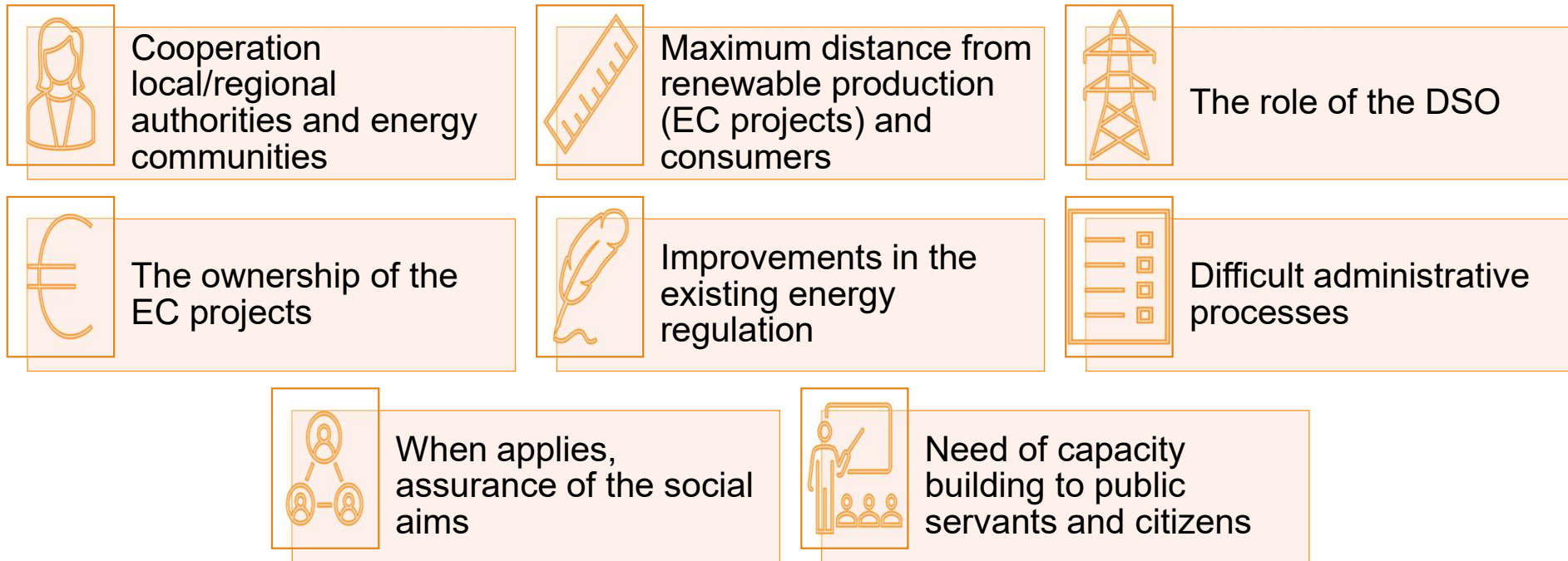


Social enterprise

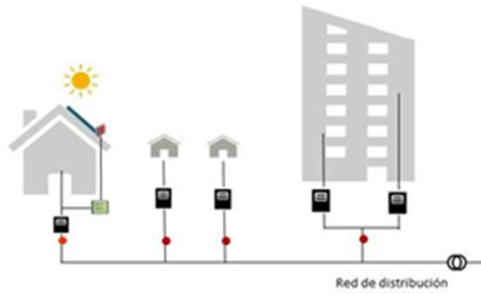


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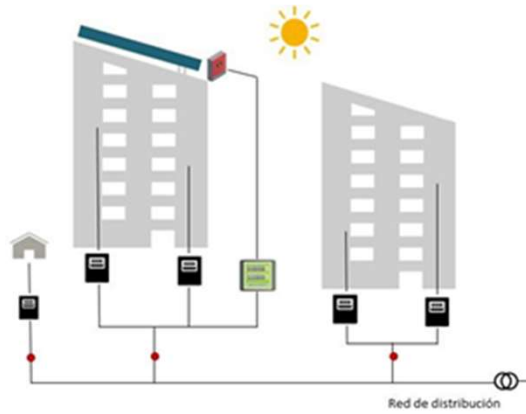
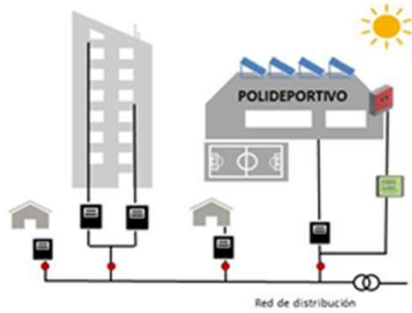
Some existing debates



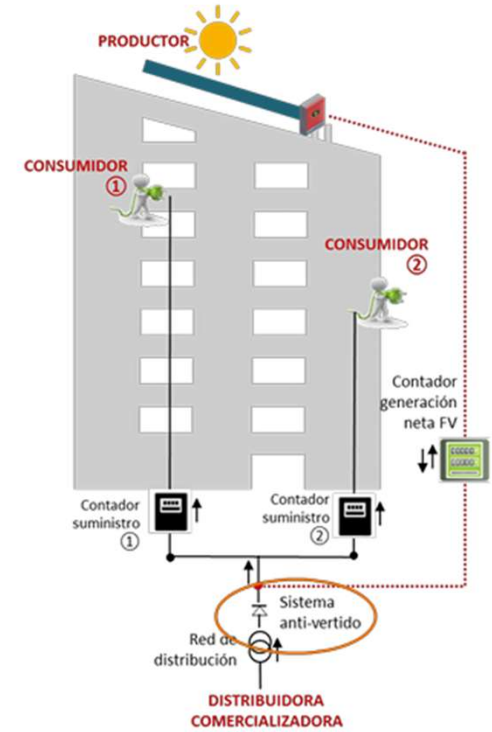
Models of electricity sharing



Generación en red interior de un consumidor (PG+PF), con otros consumidores adscritos en proximidad a través de red



Generación en red interior de un edificio, con consumidores adscritos en red interior y en proximidad a través de red



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Heat sharing



Heat sharing can constitute a project for energy communities



There are two main types of heat sharing:

- Central heating systems on individual buildings of flats
- Medium and large District Heating and Cooling (DHC)









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Drivers and challenges for energy sharing



Drivers of the development of energy sharing

- **Policy:**
 -  The National Energy Climate Plan. Aims to reduce GHG by 23% by 2030 (compared to 1990). Supports energy efficiency and renewable energy sources.
 - The CE IMPLEMENTA programme. Provides financial capacity to energy communities.
- **Market:**
 -  Strong reduction of PV installation investment costs and experience gained by engineering/installers/construction/investors
 - Electrification of the market: aerothermal technology efficiency increase, eVs, some batteries for storage, etc.
 - Potential of energy efficiency in buildings and other infrastructures
- **Regulation:**
 -  Law 24/2013 on the Electricity Sector establishing the basic characteristics of the RECs and CECs.
 - Several other regulations increase the potential for energy communities and collective self-consumption, including financial incentives program
- **Economic:**
 -  In some cases, no need to pay the grid fee
 - Increase of the property value
 - Potential of obtaining public funding reducing payback time
- **Social:**
 -  Inclusion of vulnerable households
 - Support from local authorities
 - Creation of employment
 - Fix population in rural areas
- **Other positive factors:**
 -  Development of innovative and ICT technologies
 - Possible remote online management of the energy



Status of market development for energy sharing



In December 2023 (source: The National Energy Agency, IDEA) in Spain there are 69 REC/CEC with overall 103.000 members. An example:

<i>REC/CEC name</i>	REC Monachil River Energy Community (Granada, Spain)
<i>Role of involved actors and model</i>	Cooperation of municipality and citizens. Municipality = roofs and receives a % of energy (5-10%) Citizens = invest, install and share the energy produced
<i>Legal form and members</i>	Local association 56 citizens of Monachil and 2 SMEs are the members
<i>Energy technologies</i>	PV production
<i>Economic model and Financing</i>	The members of the cooperative could provide some funding as investors, up to 1.000€ (crowdfunding). Other sources as public financing used for the projects.



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DIGITALIZATION AND BLOCKCHAIN FOR ENERGY COMMUNITIES



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Digitalization and blockchain



INEEEXS will deploy, assess and validate the use of innovative technologies as enablers of integrated services across sectors. The five core technologies include:



energy monitoring and management tools for collecting energy and non-energy data, calculating key parameters and managing equipment;



an enterprise blockchain platform to record and verify captured data;



the Smart Contract generator to enable the on-demand generation of digital contracts;



the tokenisation service for tokenising the verified contribution of participants in energy transactions;



digital user interfaces for enabling end consumers to interact with the offered services.



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OPTIMISED SELF-CONSUMPTION OF DISTRIBUTED ENERGY RESOURCES IN ENERGY COOPERATIVES Business Case Factsheets

The primary objective is to enhance the PV self-consumption within energy community users by implementing incentivisation mechanisms through messages and the utilization of tokens via Distributed Ledger Technology (DLT) and smart contracts. The BC2 focuses on identifying and implementing the most effective strategies to maximise the benefits and minimise the costs associated with self-consumption for prosumers within energy communities and the broader energy system. Additionally, the BC supports energy efficiency by using an App that provides tips on both optimised self-consumption of DER and how to reduce the energy demand.



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Target groups



Energy communities or energy cooperatives that can pool resources, share costs and benefits, and provide services to their members and the grid.



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Benefits for all

Consumer



Reduced energy bills for the households, increase in the consumption of PV produced in their municipality and improvement of their energy efficiency.

DSO



Reduced energy losses in the electricity system and a reduction of CO2 emissions.

Energy community



Increased financial muscle for the energy community and no up-front investment from energy consumers needed.

Consumer and Energy Community



Improved energy literacy of the households thanks to the interactive platform.

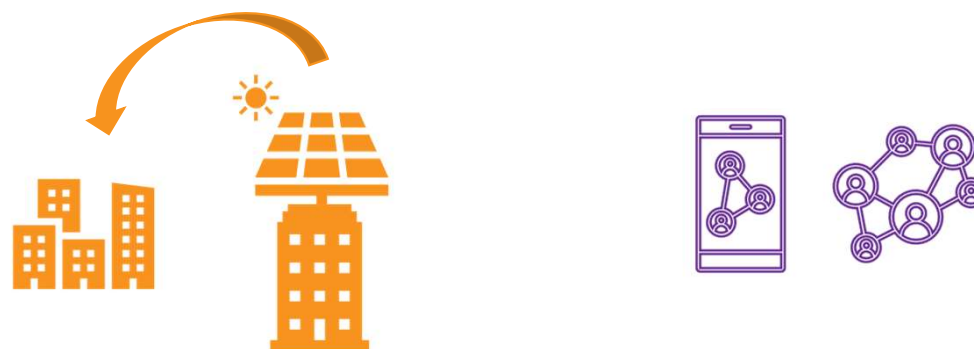
Municipality, region, country, EU



Innovation in the energy system and more flexibility to adapt to the market needs and requirements.



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