Energy Community

The catalyst for social innovation in the energy market

Business model based on energy community

Sinloc SPA

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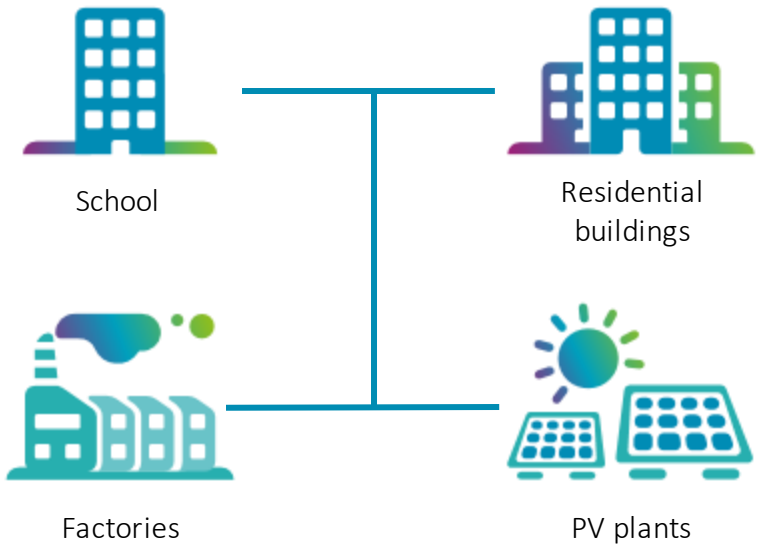
Description of the model



Energy community scheme

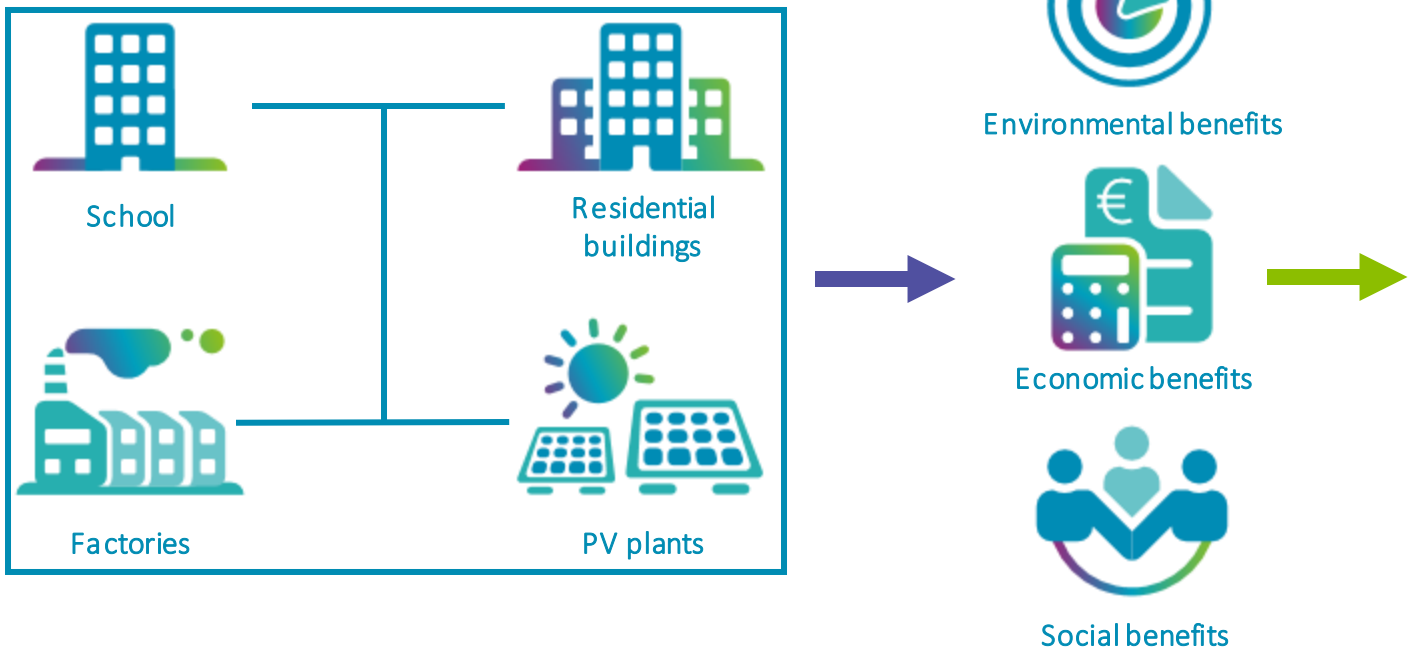
"Renewable energy community" means a legal entity:

- which, in accordance with the applicable national law, is based on open and voluntary participation, is autonomous, and is 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;
- the primary purpose of which is to provide environmental, economic or social community benefits for its shareholders or members or for the local areas where it operates, rather than financial profits;

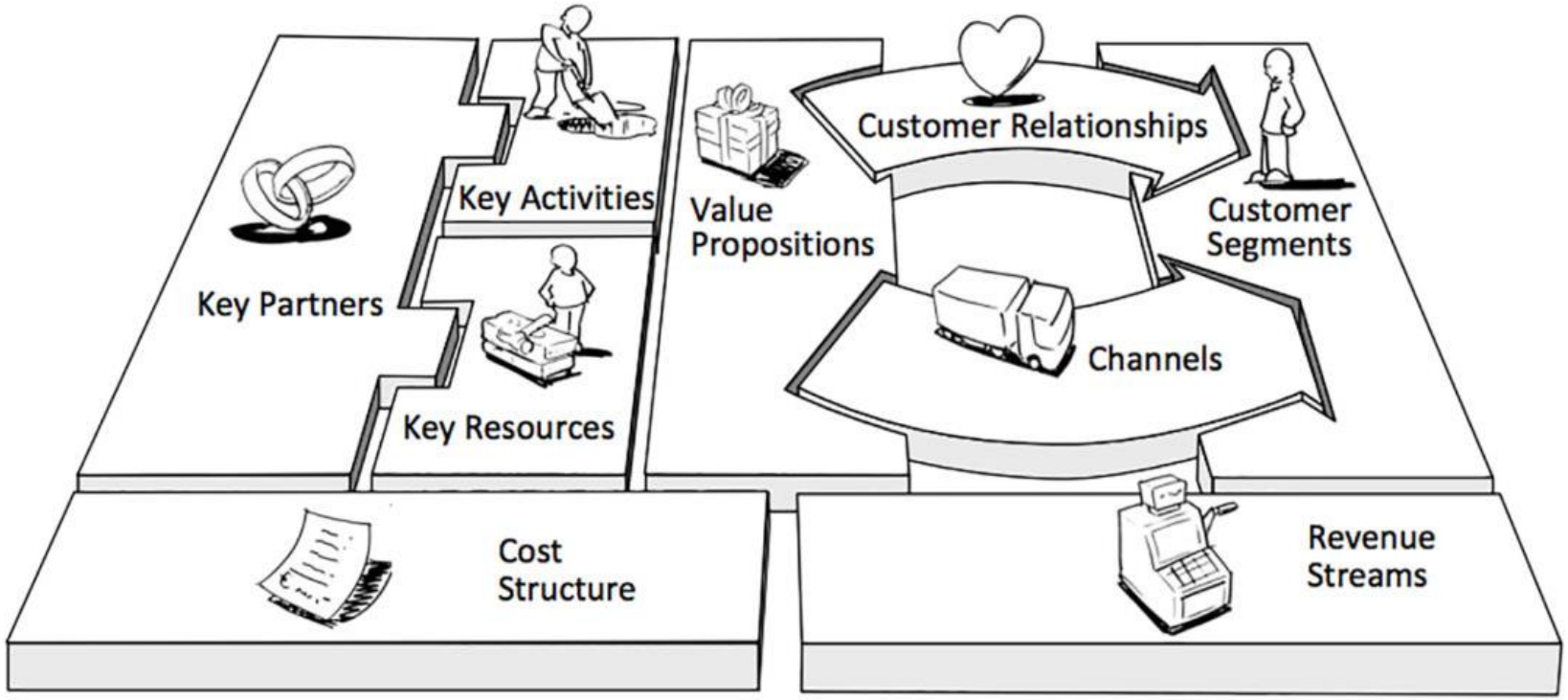
Description of the model

The main goal of an energy community is to produce 3 different kind of benefits

A renewable energy community has the objective of increasing the energy produced from renewable sources, while providing three different benefits to its members.



Business Model Canvas



Key Partners

- **Members of the community** (households, businesses, public buildings)
- **Technology suppliers**
  - For the renewable energy sources (PV, Hydro, etc.) including installation and maintenance
  - For the setting up the monitoring infrastructure
- **Banks and financing organizations**
  - For the financing of the energy community
  - For the creation of possible financial ad hoc solutions (for ex. crowdfunding)
- **Local offices of social services**
- **Local associations devoted to tackling poverty**
- **DSO**

Key activities

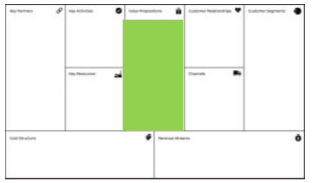
- **Setup of the Energy Community between the members**
- **Initial investment** to install the RES plant
- **Electricity generation**
  - The purpose of a renewable energy community is the production and sharing of renewable electrical energy
  - For doing so it needs specific assets and technology
- **Management of the community**
- **Generation of value from the generation and shared consumption of renewable energy**

Key resources and Time

- **Resources to start the energy community:**
  - Financial resources to purchase the energy renewable sources and relevant technology installations
  - Technical, administrative and legal expertise to set up the community

  - **Time:** to set up and start is relatively short it varies depends on the following:
  - Legal issues: regulations to set up the entity
  - Budget: if there is a grant to fund the power plant or the community has the raise the funding
    - Internal regulation of the community
  - Availability of staff: qualified personnel to set up and run (mainly through a dedicated platform) the community
  - Availability of interested community of investors (subscribers/members)

Value Proposition



- **Renewable electricity generation**
- **Delivery of 3 main benefits for the community's members**
  - Economic Benefit: Reduced electricity bills
  - Environmental benefit
  - Social benefit
- **Main focus on the social benefit generated by the community**
  - Devote that value to energy poverty initiatives
  - The community itself can decide how to use the generated value

Customer Relationships Segments and channels

- **Direct interactions**
- The community may have **different channels** based on the purposes from which is built. Members might be divided in 2 main categories:
  - Active members: members who participated in the investment
  - Benefiting members: members identified for receiving only the benefit of the community (energy poor households)
- **Active members** to be reached through dedicated engagement strategies
- **Energy poor households** can be contacted through local social services offices and dedicated associations

Cost structure
Revenue stream

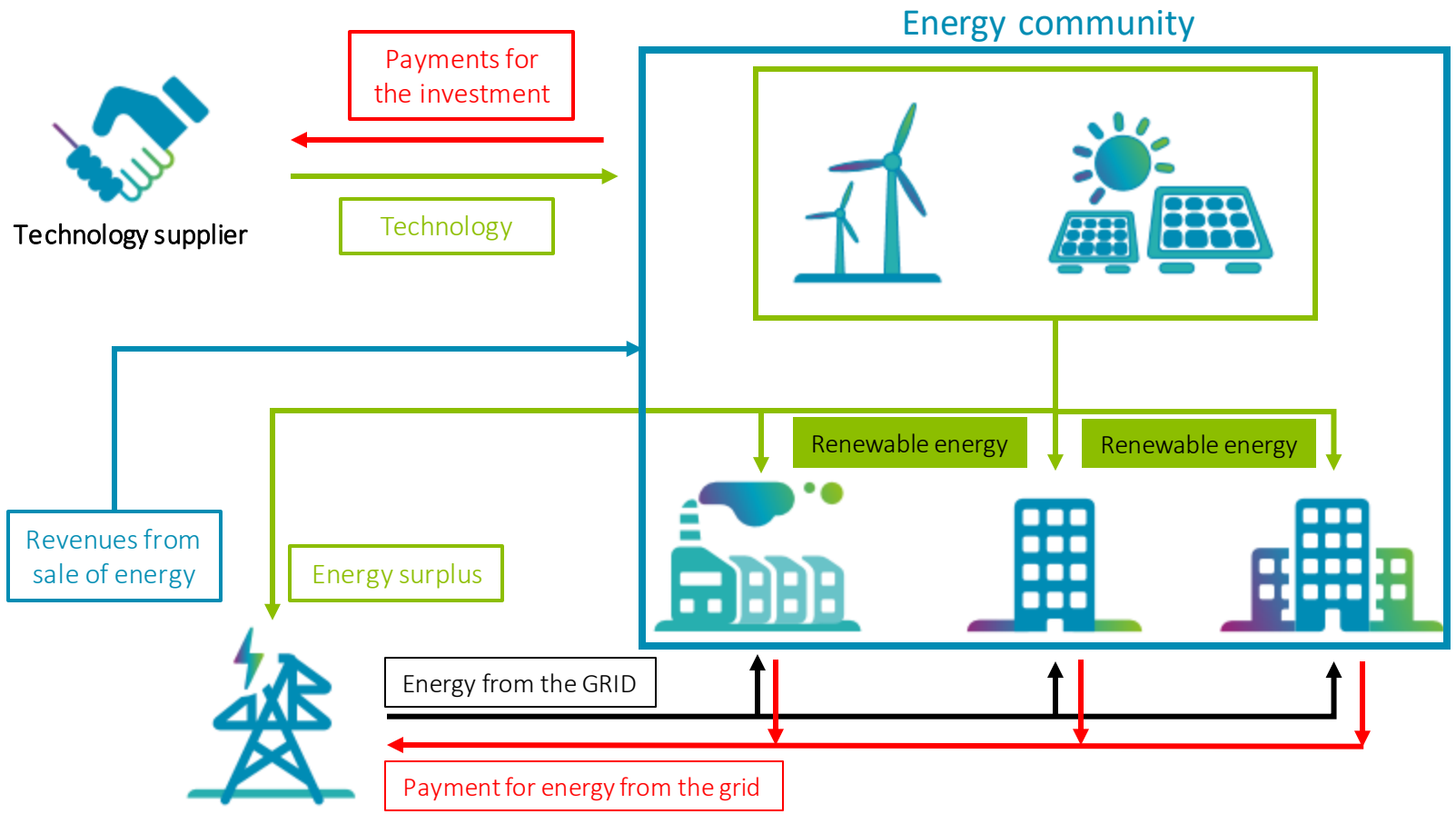
Cost Structure

- Up-front investment (Pv plants, smart meters, management platform)
- Operations and maintenance of plants and meters
- Costs for management of the community

Revenue Stream

- Surplus generated electricity (sold to the grid)
- Remuneration through dedicated incentives
- Saving from collective shared self-consumption
- Payment from DR aggregator and other system operators for providing flexibility

Energy flows



Energy community

- **Reduces energy costs through:**
  - Shared consumption of renewable generated energy
  - Efficiency of the grid
- **Generates revenue:**
  - Sale of energy surplus
  - Incentives
- **Bear the costs for:**
  - Investment in the RES plant
  - Smart meters
  - Management platform
  - Setup costs

Monetary flows – Spanish regulation

Hereafter is reported a hypothetical example of an energy community built under the Spanish regulation

TECHNICAL HYPOTHESIS		
Users	30	Unit
residentials	29	Unit
Public Administitration	1	Unit
Total annual consumption	88	MWh
% of consumption covered by RES	40	%
Annual production from RES	37	MWh
Physical self consumption	0	MWh
Shared energy	37	MWh
RES capacity (PV)	0,03	MWp

INVESTMENTS	Size		Benchmark costs		Investment	
PV Plant	30	kWp	1.000	€/kWp	30.000	€
Hardware and Software	30	unit	250	€/unit	7.500	€
Administrative costs					3.000	€
Total investments					**40.500**	**€**

The model is built starting from the number of participants, in this case 29 households and 1 Public Administration building. All buildings are virtually connected to the RES plant, and the plant is placed on top of a building whose owner is member of the community. Total energy consumption provide inputs for the dimensioning of the RES plant, in this case a PV, and the related investment costs. It is assumed that all produced energy is shared among the members, thus there is no surplus energy to be sold to the grid

For the Spanish regulation, in order to have access to simplified compensation for surplus energy, total power of the plant should be <100 kWp and at least one consumer must be internally connected with the generation installation.
There is no public incentives on shared energy, but each member is entitled to receive a discount on the energy bill for the amount of energy produced by his share of the RES plant and consumed at the same time.
On the other side, the REC has to sustains costs, mainly related to general maintenance.

Net Cash Flow	7.360 €
Payback time	**6 years**

The model generates cash flows which are able to pay back the investment in about 6 years.

REC ANNUAL COSTS	Unitary value		Total	
Plant maintenance	13	€/kWp	390	€
Infrastructure maintenance	35	€/unit	1.050	€
Data management	15	€/unit	450	€
Total costs			**1.890**	**€**

REC ANNUAL REVENUES	Energy		Unitary values		Total	
Shared energy (avoided cost)	37	MWh	250	€/MWh	9.250	€
Total Revenues					**9.250**	**€**

Monetary flows – Italian regulation

Hereafter is reported a hypothetical example of an energy community built under the Italian regulation

TECHNICAL HYPOTHESIS		
Users	30	Unit
residentials	29	Unit
Public Administitration	1	Unit
Total annual consumption	88	MWh
% of consumption covered by RES	40	%
Annual production from RES	37	MWh
Physical self consumption	7	MWh
Shared energy	30	MWh
RES capacity (PV)	0,03	MWp

INVESTMENTS	Size		Benchmark costs		Investment	
PV Plant	30	kWp	1.000	€/kWp	30.000	€
Hardware and Software	30	unit	250	€/unit	7.500	€
Administrative costs					3.000	€
Total investments					**40.500**	**€**

The model is built starting from the number of participants, in this case 29 households and 1 Public Administration building. The housheholds are virtually connected, while the P.A. is phisically connected to the RES source. Total energy consumption provide inputs for the dimensioning of the RES plant, in this case a PV, and the related investment costs. As investment costs are considered also Infrastructure and administrative costs.

Italian regulation for REC distinguishes among "physically self-consumed" and "shared" energy. In the first case, energy is directly flowing from the RES to the connected building, directly reducing the energy bought from the grid. Shared energy is energy produced and consumed at the same time by the members of the community. Shared energy receives incentives by the Government through a feed-in tariff (110 €/MWh) and the reimbursement of grid tariff (8 €/MWh). REC also receives a payment for the energy that is sold to the grid (shared or not). On the other side, the REC has to sustains costs, mainly related to general maintenance.

Net Cash Flow	6.200 €
Payback time	**7 years**

The model generates cash flows which are able to pay back the investment in about 7 years.

REC ANNUAL COSTS	Unitary value		Total	
Plant maintenance	13	€/kWp	390	€
Infrastructure maintenance	35	€/unit	1.050	€
Data management	15	€/unit	450	€
Total costs			**1.890**	**€**

REC ANNUAL REVENUES	Energy		Unitary values		Total	
Gov. Incentive	30	MWh	110	€/MWh	3.300	€
Grid tariff reimbursement	30	MWh	8	€/MWh	240	€
Sale of energy	30	MWh	90	€/MWh	2.700	€
Self consumption (not shared)	7	MWh	250	€/MWh	1.850	€
Total Revenues					**8.090**	**€**

Monetary flows – Flanders regulation

Hereafter is reported a hypothetical example of an energy community built under the Flanders regulation

TECHNICAL HYPOTHESIS		
Users	30	Unit
residentials	29	Unit
Public Administitration	1	Unit
Total annual consumption	88	MWh
% of consumption covered by RES	40	%
Annual production from RES	37	MWh
Physical self consumption	0	MWh
Shared energy	37	MWh
RES capacity (PV)	0,03	MWp

INVESTMENTS	Size		Benchmark costs		Investment	
PV Plant	30	kWp	1.000	€/kWp	30.000	€
Hardware and Software	30	unit	250	€/unit	7.500	€
Administrative costs					3.000	€
Total investments					**40.500**	**€**

The model is built starting from the number of participants, in this case 29 households and 1 Public Administration building. All buildings are virtually connected to the RES plant, and the plant is placed on top of a building whose owner is member of the community. Total energy consumption provide inputs for the dimensioning of the RES plant, in this case a PV, and the related investment costs. It is assumed that all produced energy is shared among the members, thus there is no surplus energy to be sold to the grid

For the Flanders regulation, REC is managed similarly as in the Spanish regulation, with a relevant difference in how discounts are calculated. There is no public incentives on shared energy, but each member is entitled to receive a discount on the energy bill for the amount of energy produced by his share of the RES plant and consumed at the same time. The discount comprises only the energy commodity and does not include taxes or distribution costs.
On the other side, the REC has to sustains costs, mainly related to general maintenance.

Net Cash Flow	2.735 €
Payback time	**15 years**

The model generates cash flows which are able to pay back the investment in about 15 years.

REC ANNUAL COSTS	Unitary value		Total	
Plant maintenance	13	€/kWp	390	€
Infrastructure maintenance	35	€/unit	1.050	€
Data management	15	€/unit	450	€
Total costs			**1.890**	**€**

REC ANNUAL REVENUES	Energy		Unitary values		Total	
Shared energy (avoided cost)	37	MWh	125	€/MWh	4.625	€
Total Revenues					**4.625**	**€**

Sustainable development goals

The proposed business model not only pursue his major aim of tackling energy poverty, but also contributes to the achievement of the Sustainable development goals provided by the United Nations

End poverty in all its forms everywhere

Contribution

Make cities and human settlements inclusive, safe, resilient and sustainable

Contribution

Ensure access to affordable, reliable, sustainable and modern energy for all

Contribution

Take urgent action to combat climate change and its impacts

Contribution

Key Partners

Members of the community

Technology suppliers

Banks and financing organizations

Local offices of social services

Local associations devoted to tackling poverty

DSO

Key Activities

Setup of the Energy Community

Initial investment to install the RES plant

Electricity generation

Management of the community
Generation of value from the generation and shared consumption of renewable energy

Key Resources

Resources to start the energy community

Time

Value Propositions

Renewable electricity generation

Delivery of 3 main benefits for the community's members

Main focus on the social benefit generated by the community

Customer Relationships

Direct interactions

Channels

Active members to be reached through dedicated engagement strategies

Energy poor households can be contacted through local social services offices and dedicated associations

Customer Segments

Active members: members who participated in the investment

Benefiting members: members identified for receiving only the benefit of the community (energy poor households)

Cost Structure

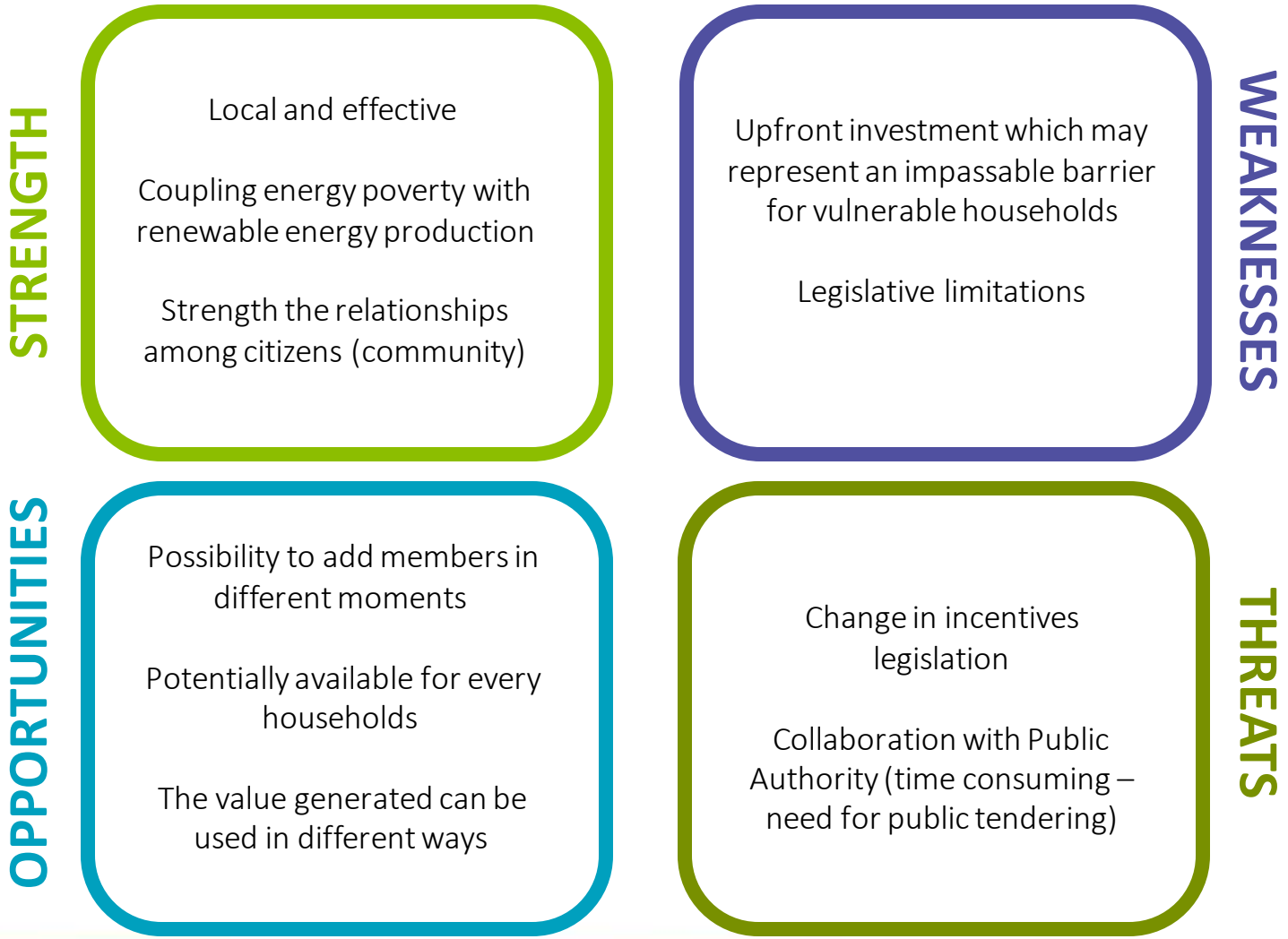
Up-front investment (Pv plants, smart meters, management platform)
Operations and maintenance of plants and meters
Costs for management of the community

Revenue Streams

Surplus generated electricity (sold to the grid)
Remuneration through dedicated incentives
Saving from collective shared self-consumption
Payment from DR aggregator and other system operators for providing flexibility

This BM contributes to the following SDGs

Business Model SWOT Analysis



Barrio Solar

Sharing renewable energy and solidarity in the community

Actur Barrio Solar is an initiative promoted by ECODES, EDP and the Zaragoza City Council, with the collaboration of the Schneider Electric Foundation, EDP Foundation and Zaragoza Vivienda, whose objective is to offer access to self-consumption of energy to businesses and homes located in the northern area of the Actur - Rey Fernando neighborhood of Zaragoza.

3 main actors

Renewable energy

Tackling energy poverty

The energy community consists of two photovoltaic installations of 50 kWp each located in the Municipal Sports Pavilions Siglo XXI and Actur V. Businesses and neighbors who are located within 500 meters of at least one of the two facilities (as stated in the RD 244/2019 on self-consumption), may participate by self-consuming solar energy without having to perform any work or installation in your home, or change electricity company.

Actur Barrio Solar is an initiative that aims to reach everyone in the neighborhood. Therefore, 10% of the energy generated will go to help 20 vulnerable families in Actur, excluding them from paying the monthly fee. Vulnerable families will simply receive renewable energy free of charge. In addition, energy audits will be carried out free of charge in the homes of vulnerable neighbors and energy efficiency measures in their homes.

Magliano Alpi

Comunità Energetica Rinnovabile Magliano Alpi

The energy community is developed around a 20 kW solar photovoltaic system, installed on the roof of the Municipal Building. Connected to the POD of the City Hall, the system is designed to ensure the self-sufficiency of the building itself, the library, the gymnasium and the municipal schools and to exchange surplus energy with 5 participating households in order to meet about 40% of electricity consumption, as well as powering a charging station for electric cars, free for community members.

Public Actor
5 Families

Renewable energy

Reducing energy costs

Positive aspects	Challenges
1° Energy comm. In Italy, now an example and a stimulus for other	Collaboration with Public Authority
Replicability	Difficult to scale

Ganshoren - « L'école Nos Bambins »

Renewable Energy Solutions for Urban communities

Belgium's first renewable energy community began on August 1, 2020 around the "Nos Bambins" school in Ganshoren. Two photovoltaic systems, one on the roof of the school, the other on the home of a district resident, now share their solar electricity with local consumers, including individuals and the municipality.

Local School
7 consumers

Renewable
Energy

Self consumption
From 18% to 64%

Average self-consumption rate of the 2 installations (before the project): 18%.

Average self-consumption rate of the 2 installations (after the project): 64%.

7 consumers (including individuals and the municipality of Ganshoren).

2 producers providing surplus electricity from two solar plants:

- 2.4 kWp and 34.77 kWp.

Decrease in the volume of electricity consumed by the supplier: - 44%.

Île d'Yeu – «Harmon'Yeu»

Renawable energy community in the west coast of France

Harmon'Yeu is collective self-consumption project launched in the municipality of Île d'Yeu and led by ENGIE. Harmon'Yeu allows 23 households to share the energy produced by five of them using PV panels installed on their roofs. Electricity in excess is stored in a common battery.

From a legal perspective, the project is organized around an "organized legal entity": an association called "Communauté d'Energie Ile d'Yeu" of which both producers and consumers are members.

According to ENGIE, during the first three months of operation 96% of the electricity produced was self-consumed by the REC members, meeting the 28% of their total needs.

23 Households

Renewable Energy

Reducing energy costs

Result of the REC implementation after 12 months

According to ENGIE first assessment, in the first 12 months, the members of the community have on average consumed 97% of the electricity produced and saved around €140 on their electricity bills.

For the second year the plan of the community is to improve the monitoring process of the electricity production and consumption. The prosumer will supported by a ENGIE app that notifies them suggestion to consume better and less.

Oeiras – Citizen led energy community

4 families energy community in condominium

In Oeiras, a group of families that live in the same condominium is getting ready to implement a local energy community. To do so, they will invest in a total of five photovoltaic modules and generate locally and sustainably part of the electricity they will use in their homes.
Coopérnico, one of the most successful renewable energy cooperative in Portugal, will assume the initial investment in the photovoltaic system for collective self-consumption and will also provide support in the legal aspects of the project, including the creation of the internal rules and the registration of the community.

4 Families living in the same building

Renewable Energy

Esco model applied for energy community

The PV technical estimates are:

- Five modules PV, total installed power of 2,25 KWp.
  - Total production/year: >3,3MWh
  - Average estimated annual bill savings for family: 154€

Coopérnico

Energia verde, sustentabilidade e cidadania

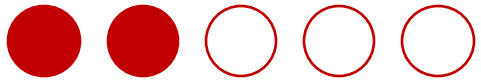
Lessons learned

Barrio Solar	▪ Selected vulnerable households involved benefit from the participation and RE generation without paying the participation fee
Magliano Alpi	▪ Initiative born from the Municipality, that offered its surplus energy to other participants, selected through a public call
Ganshoren	▪ Mixing different users (schools and households) with different consumption patterns help increase the self-consumption from the PV plant
Île d'Yeu	▪ Mixing prosumers with consumers and adding storage to the community maximizes self-consumption (96%), fully exploiting the potential of the PV
Oeiras	▪ Investment has been supported, financially and through technical assistance and advisory, by the local energy cooperative

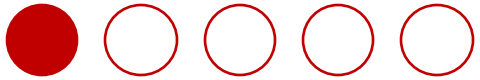
Conclusion and analysis

Legal Complexity

Set-up Complexity



Management Complexity



Replicability

Effectiveness towards energy poverty

Scalability

POWERUP

The catalyst for social innovation in the energy market

www.socialenergyplayers.eu

We are the catalyst for social innovation in the energy market