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**TERRITORIAL ANALYSIS OF DECENTRALISED
ENERGY MARKETS //**

Balenyà Sostenible

Barcelona, Spain

Case Study // May 2025

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Balenyà Sostenible, Barcelona (ES)

Relevant Local Practice: Provision of municipal buildings for renewable energy activities at low or no cost

This local practice involves energy communities cooperating with local municipalities or other public authorities to use public buildings (e.g. rooftops) or land for renewable energy installations. Local governments allow energy communities access to municipal properties at a heavily reduced cost or for free, which helps overcome financial and administrative barriers that might otherwise hinder project development. By facilitating the use of public spaces for renewable energy initiatives, this practice encourages public participation, fosters trust and promotes cooperation between citizens and elected representatives, while strengthening community engagement.

Relevant Local Practice: E-Mobility

In addition to generating and managing renewable energy, energy communities have the potential to offer a wide range of e-mobility services, further enhancing their role in promoting sustainable practices within local communities. This local practice may stem from effectively utilising surplus electricity produced by the community's renewable energy sources, or by the aim to support a broader sustainable transition. These e-mobility services include, but are not limited to, electric vehicle charging, electric car-sharing programmes, e-bike rentals, and other innovative mobility solutions. By integrating these services into the energy community's offerings, residents can benefit from convenient, eco-friendly alternatives for mobility, while also supporting the broader goals of reducing emissions, fostering local sustainability, and encouraging the use of renewable energy for transportation. This synergy between renewable energy generation and e-mobility creates a holistic, sustainable ecosystem that promotes a cleaner, greener future for the community.

Executive Summary

Balenyà Sostenible has established itself as a role model for community-driven energy transition, combining environmental sustainability with social responsibility and local economic development. Since 2021, the cooperative Balenyà Sostenible has gathered 170 members who consolidated a mature energy community which offers affordable renewable energy and services of electromobility among other services. The city council of Balenyà had a pivotal role in the establishment of the energy community, as it ceded public-owned buildings for photovoltaic installations in its rooftops to generate electricity for its distribution across the different members of the community. Fighting energy poverty is at the core of the aim and scope of the Energy Community, which is why a unique agreement was made to offer vulnerable family's affordable renewable energy at a lower price. In order to reach neutrality in the municipality, reducing CO² emissions related to transport is also crucial, which is what motivated the installation of six electric charging stations distributed around the community to promote the usage of e-vehicles.

1. Key characteristics and context

Balenyà Sostenible was founded in the Catalan municipality of Balenyà, where they have installed multiple solar panels on public-owned buildings rooftops thanks to a remarkable cession agreement. Located in Osona, a county where energy communities are rapidly being deployed, Balenyà Sostenible is now growing its scope and diversifying its lines of services. Hereafter, the foundation and history of the energy community is elaborated, followed by an overview over the community's activities and the framework in which it operates.

1.1. Location and geographical scope

Balenyà Sostenible is an energy community based in Balenyà, a municipality located in the province of Barcelona, in the autonomous community of Catalunya (Spain). The geographical scope of Balenyà Sostenible is therefore limited to the town of Balenyà and its immediate surroundings.

As shown in Figure 1, Balenyà is a small town located in the county of Osona, which belongs to the province of Barcelona. Osona encompasses an area of approximately 1,245 square kilometers and includes a diverse landscape characterised by the Plain of Vic, surrounded by several mountain ranges such as the Sub-Pyrenees, Montseny, and Guillerics. The county gathers 50 municipalities¹, which have raised the attention from the international community due to the recurrent constitution of energy communities. Balenyà has 3,822 inhabitants and a surface area of 17.4 km².

¹ <https://www.ccosona.cat/municipis/mapa>

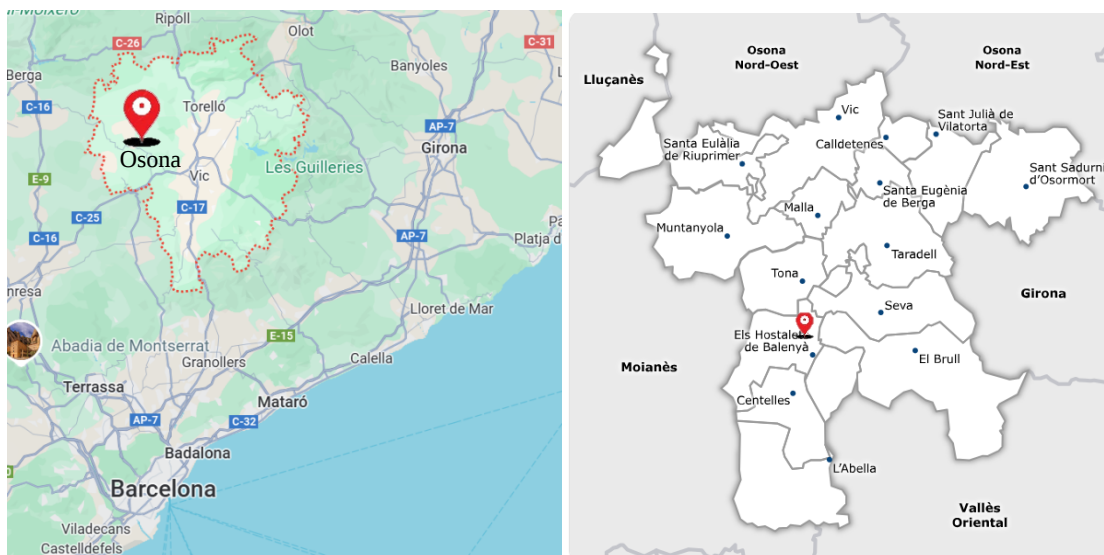


Figure 1: Osona County (on the left) and Balenyà municipality map (on the right).

1.2. Foundation & history

Balenyà Sostenible was founded in October 2021 by more than **100 residents** of the municipality of Balenyà, Barcelona. It was established as a non-profit Consumer and User Cooperative Society with the aim of advancing towards an emission-free energy transition in this specific locality by producing and sharing energy, as well as establishing mechanisms for energy management and savings.

Initially, the Balenyà City Council provided support for the establishment of their work, as it granted the energy community the use of four public building rooftops for the installation of photovoltaic panels for shared self-consumption of up to 280 kW for a period of 40 years.² The relationships between the cooperative and Balenyà's city council were influenced by the founder of the cooperative **Ramón Roig i Soler**, who acts as 2nd Deputy Mayor and Councillor for Finance, New Technologies, and Citizen Participation within the municipality.³ Having a founder with a long-established network in the city council was determinant for the establishment of key channels of collaboration since the early stages of the project.

Thanks to the public rooftops ceded, solar panels were installed in various infrastructures, including a football yard, elementary schools and later on privately-owned industrial warehouses. As a result, all members of the cooperative living in the municipality, can power their homes at a reduced price with the energy produced by the solar panels, while they are encouraged to actively participate in the cooperative work.

Since its establishment, Balenyà Sostenible has implemented projects of different nature, besides expanding those on shared photovoltaic self-consumption. The energy produced is now used to power e-vehicles through installed sustainable mobility charging points. Moreover, Balenyà partnered up with SOM MOBILIDAT to acquire an electric vehicle which is now available for shared use by community members.

As of February 2025, Balenyà Sostenible has grown to include 170 individuals and entities as members. The community continues to expand its projects, with recent activations of installations at the football field and four other locations.⁴ The cooperative has now ambitious pilot projects in their pipeline, in which they plan to implement heating and cooling systems around the energy community through a disruptive mechanism⁵.

1.3. Energy technologies applied.

The Balenyà City Council approved by plenary session the transfer of five spaces in favour of Balenyà Sostenible. Of these five spaces, the installation has been carried out in three of them (Football Field, Carles Capdevila Institute-School and El Roc Petit Nursery School), and the installation of the Pavilion is planned to be carried out before the end of 2023. Within the CE Implementa (4th Call), four more installations are planned on the roofs of companies in the industrial estate, but the resolution of this call is pending.

² <https://www.prtr.miteco.gob.es/es/proyectos/Balenyà-sostenible.html>

³ <https://www.ccosona.cat/municipis-d-osona/Balenyà>

⁴ <https://www.Balenyàsostenible.cat/els-nostres-projectes/teulades-fotovoltaiques-d%C3%BAS-compartit>

⁵ Anteproyecto piloto para el Desarrollo de una comunidad energética térmica en el municipio de Balenyà. Red de distrito de calor y frío de 5ª generación.

Among all these installations, they accumulate the following data⁶:

- **Power - 331.35 kWp**
 - **Annual Energy - 450,135 kWh/year**
 - **Connected Families - 191**
- CO2 emissions savings - 234.1 tons/year**



Figure 2: Football field in Balenyà with photovoltaic installations from the Energy Community

The energy produced in these specific installations is then distributed to different households around Balenyà thanks to coefficient estimates that allow distributors to estimate the proportional price reduction for each family. For the optimisation of the coefficient, the cooperative signed a collaboration agreement with Urban ImpactE , to optimise the distribution coefficients, with the calculation of the economic impact of each of the possible modifications, in order to have a cost-benefit balance.

Balenyà Sostenible offers additional services which use other technologies, in particular for electromobility. Currently, the energy community has six electric charging stations installed around the city, each of them with a power of 22kW⁷. To power e-vehicles, Balenyà buys renewable energy from external suppliers. In the long run, the intention is to locate charging stations in strategic points that allow to use the energy generated on the rooftops in the stations.

To pursue carbon neutrality, the city of Balenyà also committed to reduce transport-related Co2 emissions. Hence, besides installing charging stations, the city council also acquired an electric vehicle from SOM MOBILIDAT to provide car-sharing services. The model is a eBerlingo eBerlingo XL 50 kWh, with the capacity of 5 people. Currently, Balenyà Sostenible leads the maintenance of the car and its charging, while SOM MOBILIDAT provides the platform and the mobile app through which citizens are able to book the car.

1.4. National/regional enabling frameworks and policies

There are various enabling factors which have collectively contributed to creating a supportive ecosystem for the development and growth of energy community initiatives like Balenyà Sostenible in Spain. The EU's Renewable Energy Directive II (RED II), agreed upon in 2018, established new rights for people and communities to produce, sell, and own renewable energy. Recently, In June 2023, **Royal Decree-Law 5/2023**⁸ incorporated *Renewable Energy Communities (RECs)* and *Citizen Energy Communities (CECs)* as new players into Spain's electricity system. This law introduced regulatory principles for these communities, including their rights and obligations, to further integrate them

⁶ More information at <https://www.Balenyàsostenible.cat/els-nostres-projectes/teulades-fotovoltaiques-d%C3%BAs-compartit>

⁷ <https://www.Balenyàsostenible.cat/els-nostres-projectes/punts-de-rec%C3%A0rrega-el%C3%A8ctrica-de-vehicles>

⁸ Article 183 <https://www.boe.es/eli/es/rdl/2023/06/28/5/con>

into the energy market. Noteworthy, In May 2023, a draft Royal Decree was open for public consultation, aiming to provide granular rules for energy communities. However, its adoption remains incomplete as of 2024⁹.

Moreover, the Royal Decree 244/2019, established the administrative, technical, and economic conditions for **photovoltaic self-consumption**¹⁰ of electrical energy in Spain. These frameworks have influenced the scope of work of Balenyà Sostenible, due to distance limitations from energy production to consumption. For instance, one of the spaces ceded to the City Council was discarded as it surpassed the distance limitations of 500 meters which was in force. Recently, the threshold was extended up to 2km, a distance that allows an energy community based in a small municipality as Balenyà, to reach almost every household.

At the regional level, Catalonia has also shown strong commitments towards carbon neutrality, with a particular focus on rural areas, from which Balenyà Sostenible benefitted. In Catalonia, specific administrative bodies were established, namely Community Transformation Offices (CTOs)¹¹ which are also part of the Network of County Energy Transition Offices. Their role is to promote energy communities by assisting with local renewable energy projects, specifying criteria for implementation, and supporting the Territorial Plan for Renewable Energies (PLATER). Backed by the Catalan Energy Institute¹², they provide technical expertise and resources, driving the region's energy transition and fostering community participation. Balenyà was one of the pioneers receiving this support.

In 2021, Catalonia issued Decree-Law 24/2021¹³ to accelerate the deployment of distributed and participated renewable energies. This decree emphasised the need for social dialogue and prioritised projects that consider proximity of renewable electricity production to consumption centres. Likewise, the decree reduced the documentary burden required for self-consumption facilities¹⁴, allowing Balenyà Sostenible to reduce the administrative burden required for further developing its work.

2. Governance and internal organisation

Balenyà Sostenible operates in a unique environment characterised by a multitude of actors and stakeholders. This chapter elaborates the roles of Balenyà Sostenible, the city council of Balenyà and the 2nd degree cooperative OSONA Energia in the energy community's governance and management. This is followed by an elaboration of the different stakeholders and how they contribute to the business model and funding sources, which indicate its financial operations.□□

2.1. Governance model

Balenyà Sostenible operates as a non-profit **Consumer and User Cooperative Society**, with a governance model that emphasises community participation and local engagement. The cooperative is open to various local actors, including individuals, local authorities, and small to medium-sized enterprises.

The governance model prioritises environmental, economic, and social benefits for members and the local community over financial profits, reflected in initiatives such as allocating 10% of produced energy to vulnerable residents. Focusing on activities within Balenyà municipality, including energy production, sharing, and management, the cooperative likely maintains transparent operations to keep members informed about projects and financial matters. This structure allows Balenyà Sostenible to function as a locally-driven, democratic organization that balances community needs with environmental goals in pursuing the energy transition.

Ownership and legal model

Natural and legal persons can become members of the energy community after a modest capital contribution of **50 euros**, which applies to both types of members. As of February 2025, it boasts **170 members**. From those members, over 100 individual residents founded the cooperative in October 2021. This suggests that natural persons may have a strong influence in the community's decision-making processes. All members, whether natural or legal persons, have the right to participate in the cooperative's governance through working commissions and the General Assembly.

Decision-making

⁹https://www.idae.es/sites/default/files/general_content/NEWS_ON_ENERGY_POLICIES_IN_SPAIN_FROM_MARCH_2023_TO_AUGUST.pdf

¹⁰<https://www.idae.es/noticias/el-gobierno-aprueba-el-real-decreto-por-el-que-se-regulan-las-condiciones-del-autoconsumo>

¹¹<https://catalangovernment.eu/catalangovernment/news/486682/president-aragones-after-ten-years-catalonia-resumes-its-drive-towards-more-wind-energy>

¹² <https://www.eneragen.org/en/members/icaen-catalan-institute-of-energy/>

¹³ https://www.interregeurope.eu/sites/default/files/good_practices/Further%20information.pdf

¹⁴<https://catalangovernment.eu/catalangovernment/news/414943/the-government-modifies-the-renewable-energy-decree-to-accelerate-the-energy-transition-in-catalonia>

Decision-making mechanisms follow democratic principles, with members having a say in the organization's direction and projects. The cooperative is led by a **Board of Directors (Consejo Rector)** and works closely with local authorities, as evidenced by the Balenyà City Council's grant of public building rooftops for solar installations.

The Board of Directors is responsible for the day-to-day operations, although there is a **General Assembly** where all members participate and make use of their voting rights. The purpose of the cooperative is the inter-cooperation of the members to help them generate tools and services that allow them to improve the energy transition process.

2.2. Key actors and stakeholders

The successful deployment of energy communities tends to be related with well-established cooperation mechanisms across key regional actors. In this case study, collaboration with public and private entities was key, but also with sister energy communities in the region.

Balenyà Sostenible is a founding partner of the 2nd degree cooperative **Osona Energia Cooperativa**, together with other cooperatives from the Osona county and beyond (i.e. 30 cooperatives from different regions of Catalonia). Initially, this cooperative emerges from a Strategic Plan to decarbonise the county, which included strategic lines for promoting and articulating actions together with local agents, which is how the idea of fostering the establishment of energy communities was born.

Ramón Roig Solé is also a Secretary in Osona, so having a key player actively involved in the network has also raised visibility and even channelled additional funding opportunities. Osona Energia brings together all the city entities and provides them support for **the professional management of the projects, coordinating joint actions** and sharing and **scaling good practices**.

Moreover, partnering up with private actors allowed Balenyà Sostenible to strengthen the energy-sharing schemes and to offer additional services (e.g. car-sharing services from Som Mobilitat¹⁵). Likewise, Balenyà Sostenible has made an agreement with two companies located in the Bòbila industrial estate for additional photovoltaic installations. Part of the energy generated in these two installations is provided to the company as a rental, while the rest is distributed among members of the energy community.

With regards to the role of **the public sector**, for this local practice having close collaboration with the City Council of Balenyà was key. Ramón Roig **i Soler** was also part of the City Council, which allowed him to have a first contact with the local entities and introduce the pilot project in a soft approach. Moreover, to promote inclusive practices and involve vulnerable families as beneficiaries of the energy community, an agreement was signed with both the City Council of Balenyà and the Mancomunitat la Plana¹⁶, who led the screening process to select the eligible families for the grant. Table 1 presents the role of each actor in the collaboration scheme.

¹⁵ <https://www.sommobilitat.coop/>

¹⁶ A mancomunidad represents a specific type of local governmental entity in Spain with distinct legal personality. The primary purpose of mancomunidades is to enable municipalities to collaborate on shared initiatives and services. Municipalities voluntarily delegate certain functions and powers to the mancomunidad, creating management bodies that are separate from those of the individual municipalities. Each mancomunidad operates with its own distinct budget.

Table 1: Agreement between Balenyà Sostenible, Ajuntament de Balenyà and Mancomunitat de la Plana to protect vulnerable families.

Balenyà Sostenible	Ajuntament de Balenyà I	Mancomunitat la Plana
<p>The Balenyà Sostenible energy community, SCCL, is committed to:</p> <ol style="list-style-type: none"> Formalise the registration as members of the energy community for the purposes of sharing energy with 6 vulnerable households assigned by the social services from Mancomunitat de La Plana. Advise households on energy savings and photovoltaic installations. Communicate all changes in households of the shared energy beneficiaries to the Mancomunitat La Plana. Communicate to the Mancomunitat La Plana the increases in photovoltaic energy available to share with the vulnerable households. Pay back the EUR 300 fee borrowed to the Mancomunitat La Pana . An agreement establishes the duration of this loan, which will then be reimbursed at the established end date- 	<p>The City Council of Balenyà is meant to:</p> <ol style="list-style-type: none"> Ensure compliance with the obligation of the energy community to share renewable energy to the selected vulnerable households. Commitment to maintain the cession of public-owned rooftops managed by the energy community. 	<ol style="list-style-type: none"> Lend EUR 300 to Balenyà Sostenible to cover the expenses for 6 vulnerable homes in the municipality of Balenyà (selected as beneficiaries by the social services) to become members of the energy community. This economic contribution must be reimbursed once the established loan duration reaches its end. Perform a continuous evaluation according to the criteria established in for the household beneficiaries to determine whether they still meet the defined energy poverty criteria. Communicate to Balenyà Sostenible the households and people/families proposed to be beneficiaries of shared energy. Keep the municipality informed of the beneficiaries' identity. The Social Services of La Plana Mancomunitat will monitor and establish the corresponding resources to the people proposed to be beneficiaries of the energy shared throughout the time . Publish the present agreement in the Transparency Portal of the Mancomunitat.

2.3. Administration

The Balenyà Sostenible technical team currently consists of 3 people, who focused on moving forward with the cooperative's project and dealing with accounting tasks. On another layer, the cooperative benefits from the services provided by Osona Energia¹⁷ which provides services to all energy communities. The team deals with day-to-day management tasks of the cooperatives, acquiring IT and management tools, searching for financing and its conditions or technical aspects, such as the development of projects or the management of construction during execution.

2.4. Business model

As previously stated, Balenyà Sostenible is a non-profit cooperative whose primary objective is to generate renewable energy from photovoltaic sources and distribute it among its members. Initially, a small capital of about 3000 EUR served as an upfront investment from the initial members of the cooperative. To start its operations, the public cession of infrastructure, coupled with the investments from the financial cooperative Coop57 and public grants fuelled the establishment of a functioning cooperative.

Once established, members are requested an initial entry fee of €50 to join the community. Cooperative members are of different nature, including natural persons, private companies and public entities. All of them benefit from the cooperative services, namely: accessing renewable energy at an affordable price, charging e-vehicles in determined stations and booking the usage of one e-vehicle.

For the first service, the electricity generated by the system is fed into the existing public electricity grid and used by the member participating in Balenyà Sostenible aiming to cover their daily electricity consumption. Members pay the energy community a rate of about 0.15 EUR per kWh for the electricity from the energy community's solar panels, which is lower than comparable energy suppliers. This payment is managed by Balenyà Sostenible. Moreover, the public and private buildings on which the energy community installed its PV panels can consume the electricity free of charge. This agreement allows the energy community to use these rooftops without paying an additional rent for them.

Moreover, Balenyà Sostenible has 6 **charging stations** for semi-fast charging electric vehicles (22kW) in the municipality, operated directly by the Balenyà City Council and the company J.Pont, Members can charge their e-vehicle at an advantageous price, but this service line does not seem to be generating significant revenue yet.

Finally, with regard to the **car-sharing service**, the cooperative collaborates with SOM MOBILITAT. The collaboration scheme is determined by: Balenyà Sostenible who owns the e-vehicle and oversees its correct operation, the City Council of Balenyà, whose the main user; and SOM MOBILITAT who provides the app for consumers to book the car. The cooperative members can access this rental at a reduced cost (3€/hour or 30€/day), and the cooperative gets revenue from SOM MOBILITAT on a monthly basis depending on the car usage.

Overall, if revenue is generated, the cooperative reinvests profits into expanding renewable energy projects, improving energy efficiency, and supporting vulnerable households by providing them with free solar energy during daylight hours.

2.5. Grid connection

Individual members of the energy community connect to the grid through a shared self-consumption model. Balenyà Sostenible produces solar power in the photovoltaic installations from the public rooftops, and the energy generated is shared through a self-consumption model. After paying the contribution fee, members need to send a copy of their recent energy bill to the cooperative which will be used as a basis to estimate the equivalent price reduction.

The cooperative aims to distribute the generated energy equally between members, resulting in about 1.5kWp of solar panels per family to cover the daily consumption of the connected homes. The maximum price is expected to be at EUR 0.15 per kWh when economically feasible for the energy community. To ensure that estimates are efficient, the cooperative has partnered up with Urban ImpactE to optimise coefficients. Urban ImpactE oversees how to optimise the distribution coefficients, with the calculation of the economic impact of each of the possible modifications, in order to have a cost-benefit balance.

With this current scheme, the energy community has the capacity to power about 191 families. Like other energy communities, reaching mature energy-sharing schemes can be challenging. For instance, the scope of this scheme is subject to national regulations, as legally there has been a varying maximum distance from power generation to self-

¹⁷ <https://www.oecoop.coop/>

consumption (ranging from 500m to 2 km). Moreover, the energy distribution is stuck to some extent to the willingness of DSOs to apply price reductions based on the integration of the locally produced energy into the grid. Even though the percentage is low, in some cases, DSOs did not apply the price reductions to the household, in which case Balenyà Sostenible still covers the difference to ensure fair distribution.

Moreover, with regards to the electricity used for the e-charging stations, the cooperative relies on external energy suppliers, so the role of the energy community is to install and maintain the e-charging stations. Nevertheless, Balenyà Sostenible envisions connecting the charging points to their PV installations in the long run .

2.6. Access to finance

Balenyà Sostenible has successfully secured funding through various channels to support its environmental and community projects. Being aware of the difficulties to access financing from traditional entities, the energy community owners targeted atypical sources of funding, such as Coop57, a Catalan cooperative financial services organization that focuses on ethical and solidarity-based finance. This financial support coupled with the initial contribution of the cooperative members allowed the group to start functioning.

At its earliest stage, in 2022, thanks to the project CE Implementa¹⁸, the energy community was granted by the Energy Diversification and Saving Institute (in Spanish Instituto para la Diversificación y Ahorro de la Energía (IDAE) a significant grant to deploy the photovoltaic installations on the granted rooftops. Balenyà Sostenible was given one of the highest grades by IDAE in Spain with this project. Furthermore, in 2023, the organisation was awarded a €50,000 grant from the Catalan government's "Programa de Desenvolupament Sostenible" to implement a community solar project.

The European Commission has recognised the strategic importance of the project, which for instance has received funding from the Recovery Plan and is part of Component 7, "Deployment and integration of renewable energies", Reform 3: "Development of energy communities"¹⁹.

Since then, the energy community has deployed its installations which are now up and running, while additional services as the electric charging stations, have yet to generate significant revenue, there are signs that this is gradually changing.

3. Impact and Analysis

The activities conducted by Balenyà Sostenible have had a significant impact on the local community. The following section presents an analysis of the main social, environmental and economic impacts, including an examination of the key innovative elements of the energy community approach and an investigation of the principal drivers for its success. The identification of the necessary and supporting conditions and actions, their potential transferability and replicability to other contexts, as well as the key findings of the study. A particular emphasis is placed on the local practice of municipal-led initiatives.

3.1. Social, environmental, and economic impacts

Social impacts

Balenyà Sostenible has a strong social component in its nature. This energy community emerged as a potential mechanism to reduce the portion of households at risk of energy poverty. To ensure equal accessibility to the households of Balenyà keen in benefit from the energy community work, Balenyà Sostenible signed an agreement with the City Council of Balenyà and the Mancomunitat La Plana to cover the fee of vulnerable families so that they could access solar energy at a reduced cost while being actively involved in the activities of the cooperative and enjoying equal voting rights.

Moreover, Balenyà Sostenible agreement with Som Mobilitat allows access to e-vehicles to all members of the cooperative, which may not be able to access this service otherwise.

The energy community work has also expanded its scope of work beyond Osona, as it has recently started working on International Cooperation projects aiming to expand energy poverty reduction schemes in least developed countries. The cooperative has deployed "solar ovens" that are benefiting multiple families in Senegal, together with Bantandicori Association, as shown in Figure 3. In the same vein, the cooperative has developed photovoltaic installations in

¹⁸ <https://www.Balenyàsostenible.cat/ajudes-ce-implementa>

¹⁹ https://barcelona.spain.representation.ec.europa.eu/estrategies-i-prioritats/next-generation-prop-teu/projectes/empoderament-local-la-transicio-energetica-Balenyà_en

elementary school rooftops and it's currently designing a project to develop a maternity shelter to be implemented in Senegal. These projects showcase the potential of energy communities to expand it's social impact beyond their region.



Figure 3: Balenyà Sostenible team handing over solar ovens to Bantandicori Association as part of the Tabassaye Project. Source: Balenyà Sostenible Website

Environmental impacts

Balenyà Sostenible has made significant strides in environmental sustainability and carbon emissions reductions in the municipality. As of February 2025, they have produced a cumulative total of 225.000 kWh of renewable energy. This prevented 9.8 tons of CO₂ emissions, and its environmental impact is equivalent to the plantation of 15 trees²⁰. Decarbonising Balenyà not only involves a shift in energy production, but also a reduction in the emissions related to transport, which is why the cooperative started offering e-mobility services. The neighbours of Balenyà have now access to 6 semi-rapid 22 kW e-vehicle chargers throughout the municipality, what has fostered the comfort usage of e-vehicles. Those unable to own an electric vehicle are also able to book the e-car available thanks to Som Movilitat. In the long run, the energy community plans to expand its vehicle fleet in order to reach more families.

The cooperative helps its over 200 members achieve savings on energy bills through shared self-consumption of actively participating in the energy transition. Raising environmental awareness among citizens is of vital importance to promote sustainable means of life, and conscious consumption habits.

Economic impacts

The cooperative helps its 170 members achieve savings on energy bills through shared self-consumption of renewable energy, capable of powering approximately 400 households. By promoting a green and sustainable economy, Balenyà Sostenible likely contributes to job creation and local economic activity. The initiative also offers shared mobility services, charging €3 per hour or €30 per day for electric vehicle use, allowing neighbours to access electric vehicles at a lower cost, without necessarily owning it.

Perhaps most importantly, by fostering local energy production and reducing dependence on external sources, Balenyà Sostenible is paving the way for long-term economic benefits and stability in the region, while simultaneously advancing sustainable development goals.

3.2. Innovativeness

There are several innovative elements of the Spanish energy community of Balenyà Sostenible. First of all, its **cession agreement** of public-owned buildings for community-led photovoltaic installations sets a benchmark on how municipalities can have an active role in setting up energy communities. In addition, the public spaces used in the project vary in nature, ranging from **football yards and public schools to privately owned industrial warehouses**. Secondly, being part of a **2nd degree cooperative** like Osona Energia shows an innovative way to share knowledge across key regional players while initiating transfer and replication in the direct vicinity. Navigating the national legal frameworks for energy communities is a difficult endeavour, so having access to multiple lessons learned from neighbouring case studies is very helpful.

²⁰ <https://www.Balenyàsostenible.cat/>

Balenyà Sostenible has accessed Spanish grants thanks to setting a **strong focus on the innovative nature** of the pilot projects they proposed. For instance, they are currently developing advanced district heating and cooling systems to be implemented in the near future. Similarly, the exploration of alternative ways to apply their **knowledge to address the challenges faced by developing communities** has shown how energy communities can contribute to other contexts. In this case study, the Spanish energy community deployed ovens powered by solar energy that could improve food security in Senegalese communities.

3.3. Inclusiveness

Fighting energy poverty is a key objective of Balenyà Sostenible's work, and to do so the cooperative partnered up with Mancomunitat la Plana and Balenyà's City Council. The three actors signed an agreement to integrate vulnerable groups into the benefit scheme of the energy community. The Mancomunitat leads the social services sector, which explains their role in selecting the beneficiaries. This initiative does not target extreme energy poverty cases, but rather that group of people who may have property but still have difficulties to reach the end of the month. A common profile of this aid beneficiaries are households whose income comes from widowed pension schemes.

The aim of this initiative is also to empower vulnerable families and involve them actively in the decarbonisation process from their region. To this end, besides benefitting from accessing renewable energy for free, these families will also become members of the Energy Community and hence contribute actively to the social activities of the cooperative. The membership 50 EUR fee that Balenyà Sostenible requests its members is covered by the Mancomunitat la Plana during a 4-year period.

A second work has been carried out in the collaboration of Balenyà Sostenible in the Sun4All project²¹, in order to define models and work schemes that make compatible the development of renewable investment projects with the objective of facing the problem of energy vulnerability. The project is long-term with the collaboration of various energy communities and involving the coordination of Osona Energia. Balenyà Sostenible acts as a Learning Community, so it is intended to identify eligible participants and invite them to take part in the project.

3.4. Key drivers for success

Balenyà Sostenible has shown an interesting development as an energy community, leveraging several key factors. The cooperative has built a strong network with other cooperatives through OSONA Energia, facilitating knowledge sharing and access to funding opportunities. Having a strong network supporting the energy community work allows to channel promising opportunities and benefit from knowledge spillovers from neighboring actors. This case study is located in a regional cluster in Osona, Catalonia, which has helped establish it as a reference model for sustainable energy transition. Figure 3, shows the portion of the county that has energy communities officially established in dark blue.

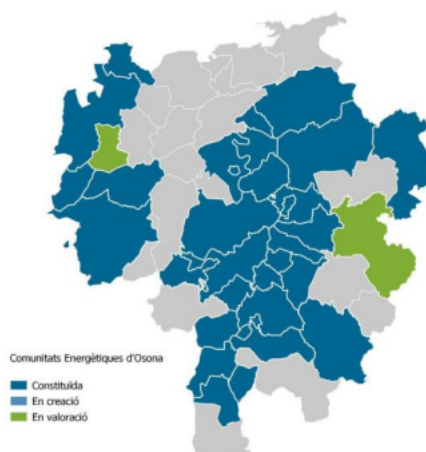


Figure 4: Energy Communities of Osona Distribution Map. Source- Sun4All²²

A crucial partnership with the Balenyà City Council provided valuable support through the cession of public building rooftops for solar panel installations. Having legally binding agreements of close collaboration allowed Balenyà Sostenible to fully deploy their work in a rapid way.

²¹ [Sun4All](#)

²² https://sunforall.eu/fileadmin/user_upload/Resources/D5.8_Sun4All_Sustainable_Implementation_Plans_M36_ICLEI.pdf

Balenyà Sostenible has also capitalised on various funding opportunities, including significant grants from programmes like CE Implementa, managed by IDAE, which provided €245,020.17 from NextGenEU funds for initial projects and an additional €1,140,253.28 for ongoing expansions. This combination of community engagement, public-private collaboration, regional integration, and strategic funding has positioned Balenyà Sostenible as a pioneering force in local energy transition and community-driven sustainability.

3.5. Replicability and transferability

The analysis of the Balenyà Sostenible has revealed a number of practices that are readily replicable and transferable to other national and European contexts.

The local practice which entails the **cession of public-owned buildings for energy communities, is context-specific**, as it relies on the national legal frameworks applicable to procurement and public-private partnerships. Nationally, this case study has high replicability potential, as the Spanish legislative framework allows this kind of collaboration. For the cession of public rooftops for community-led photovoltaic installations, Balenyà Sostenible drafted detailed **terms of reference** that have served as a sort of template to be used by other municipalities beyond Catalonia. Many of them have already replicated the structure of the agreement in other energy communities. In the same vein, Spanish municipalities of similar nature could **replicate the compensation scheme** to include vulnerable households as active members of the cooperative thanks to various public actors.

At the European level, several energy communities have proved the feasibility of installing solar panels in public-owned buildings, even though certain legal barriers may impact its deployment. Having **close collaboration with the public entities** is crucial to foster their active involvement along the process. Even in countries lacking specific regulation, having key public actors engaged in the process will allow to explore the alternative ways to promote community-led photovoltaic installations are feasible. Including key strategic details in **public procurement schemes** is an effective mechanism to promote the engagement of social players like energy cooperatives.

Furthermore, the **establishment of a second-degree cooperative** proved to serve as a knowledge sharing network across energy communities in the region. Osona Energia fostered the involvement of multiple members of society. Creating real **community ownership**, and forging alliances has been a pivotal factor in the creation and subsequent development of the energy community. This approach can be applied to other communities, especially for those with 5000 inhabitants or less, which may struggle to gain visibility independently. Having a broader entity to represent the energy community interests could be an interesting approach.

3.6. Main takeaways and recommendations

A. Takeaways and recommendations on the provision of public buildings for renewable energy activities at no cost

To enhance the viability of energy communities built around publicly owned buildings, several strategic recommendations have been identified.

Firstly, having an efficient public procurement structure is crucial to ensure functioning public-private agreements are developed. For the establishment of this agreement, having carefully developed **Terms of Reference allows the establishment of cooperation mechanisms** between the cooperative and the municipality who plans to cede the facilities.

Furthermore, to foster this kind of arrangement, having **close collaboration and engagement with the City Council** is key. For instance, Balenyà's Sostenible President previous work for the public authorities, coupled with his active role leading the work of the 2nd degree cooperative Osona Energia has been determinant.

Having a network of cooperatives has been pivotal to accelerate the deployment of this local practice, as **knowledge-sharing ensures regional alignment** across public entities and hence strengthens the collaboration schemes. Cession agreements across local entities in the region of Osona, could then benefit from the lessons learned by the different energy communities.

Similarly, key players can better explore the pros and cons of the different collaboration agreements that can be reached for the usage of public-owned buildings. Collaboration schemes vary, sometimes, the energy community might need to pay a certain fee to the municipality for the used space, and sometimes benefits are given in the shape of price reductions in the electricity bill.

B. Takeaways and recommendations on the use of electricity produced for electromobility usages.

Balenyà Sostenible utilised the electricity produced for **electromobility**, another local practice that deserves careful analysis. This local practice tends to be operationalised with **external energy suppliers during the first stages**. Powering stations is a difficult endeavour, as it requires having the energy at the right time, what might be challenging for smaller energy communities.

As the energy community is consolidated, feeding the electricity into the grid, and powering the e-charging stations is more feasible, although detailed technical and legal studies are needed. In a longer run, Balenyà Sostenible aims to install e-charging stations nearby the photovoltaic installations, as a shorter distance is preferred for self-consumption to be feasible,

The role of the energy community when powering e-charging stations is not an option, as in this case, is to install and maintain the them, while external suppliers power them. When possible, careful screening the suppliers energy sources origin can ensure that the electricity is renewable, to the extent that this information is available. The members of the cooperative, are able to charge their vehicles at a lower price thanks to the involvement of the cooperative..

Other takeaways and recommendations

The takeaways and recommendations resulting from the examination of this case study highlight several additional critical factors for successful implementation and scalability.

Firstly, the role of **Osona Energia** as a second-degree cooperative was pivotal for knowledge sharing across energy communities in the region, allowing to learn lessons from similar players, having a common network of energy communities also strengthens the representation and visibility of energy communities' work at a national level.

Secondly, the public-private collaboration schemes between public authorities of different scopes and the cooperative to promote the inclusion of vulnerable groups in the energy community's work allows to strengthen the social impact of the work. This scheme is not only focused on providing renewable energy to vulnerable households but also encouraging them to have a proactive role.

Last but not least, this case study showcases how energy communities can expand their impact beyond their region, through international cooperation. Balenyà Sostenible has developed solar power installations for self-consumption outside Europe, to build capacity and implement pilot projects in a completely different context, as Senegal. Expanding the usage of local practices and tailoring their work to be applied elsewhere could be strategic to further develop energy communities' scalability.

This case study was developed as part of the project Territorial Analysis of Decentralised Energy Markets conducted for ESPON EGTC. It is based on information that is publicly available online, on the energy community's own webpage, as well as on information collected through a semi-structured interview with representatives of the energy community. The reviewed documents include:

- Anteproyecto piloto para el desarrollo de una comunidad energética térmica en el municipio de Balenyà (2023), SUNO.
- Estatuts de la Cooperativa de persones consumidores i usuàries "Balenyà Sostenible, SCCL"
- Comptes anuals Balenyà Sostenible (2022)
- Conveni de col·laboració entre L'Ajuntament de Balenyà, la comunitat energètica Balenyà Sostenible (SCCL) i la Mancomunitat Intermunicipal Voluntaria La Plana per la reducció de la pobresa energètica en famílies vulnerables (2024)
- Sun4All Sustainable Implementation Plans for nine Community of Practice Observers (2024)
- Plec de clàusules tècnico administratives particulars que regiran l'adjudicació directa de la concessió demanial de l'ús privatiu de les cobertes d'alguns edificis municipals de l'Ajuntament de Balenyà (2021)

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