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

EGTC DUERO-DOURO and the EFIDUERO cooperative

Spanish-Portuguese border

Case Study // MARCH 2025

Table of contents

Executive Summary	2
1. Key characteristics and context	2
1.1. Location and geographical scope.....	3
1.2. Foundation & history.....	3
1.3. Energy technologies applied.....	4
1.4. National/regional enabling frameworks and policies.....	5
2. Governance and internal organisation.....	6
2.1. Governance model.....	6
2.2. Key actors and stakeholders.....	7
2.3. Business model.....	7
2.4. Grid connection.....	8
2.5. Access to finance.....	8
3. Impact and Analysis	8
3.1. Social, environmental, and economic impacts.....	8
3.2. Innovativeness.....	9
3.3. Key drivers for success.....	9
3.4. Replicability and transferability.....	10
3.5. Main takeaways and recommendations.....	10

EGTC DUERO-DOURO and the EFIDUERO cooperative, ES-PT border

Relevant Local Practice: Cross-border (quasi-) energy community

The establishment of cross-border (quasi-) energy communities, which involve collaboration between communities in adjacent border regions from two or more countries. Such collaboration may include, for example, joint ownership, other forms of financial cooperation, energy sharing, or other cross-border actions such as energy awareness raising. These types of energy communities facilitate cross-border collaboration and social cohesion, foster stronger political and social ties between neighbouring countries, while ensuring that affected residents on both sides of the border receive the chance to participate in the renewable energy initiative.

Executive Summary

This case study elaborates on how the local practice of a Cross-border (quasi-) energy community enabled the development of a local community energy project in the region of Douro-Douro at the border between Spain and Portugal. The key actor in this case is the European Grouping of Territorial Cooperation (EGTC) of Douro-Douro, an entity that has the mandate of representing the citizens of this area as well as implementing policies and activities with the objectives of helping this cross-border territory. The EGTC was able to establish a European Energy Cooperative named “Efiduero SCEL” with the objective of distributing the electricity amongst the municipalities, citizens, and SMEs located in the cross-border territory. The set-up is very peculiar, encompassing PV plants owned by the EGTC, producing the energy then distributed by the cooperative. All in view of contributing to the energy transition of the territory and achieving its energy independence as well as securing its electricity supply. The following pages detail how the EGTC carried out the project, set-up the entity and dealt with the specific cross-border barriers faced.

This Case Study yielded a series of key takeaways such as how strengthening EGTCs and municipal cooperation is essential for effective cross-border energy governance, as well as the need for stronger mandates and streamlined regulations to facilitate such undertaking. Moreover, flexible legal frameworks and harmonised permitting procedures would facilitate smoother energy trading between regions, increasing the potential activities for cross-border energy activities. Lastly, increased financial support through EU programmes, improved grid access, and incentives for decentralised projects could enhance cross-border energy resilience, while encouraging innovation, cooperative-led initiatives, and the expansion of smart grids can drive socioeconomic benefits and long-term energy independence in border regions.

1. Key characteristics and context

The (quasi-) cross border energy community of Douro-Douro is a key initiative of cross-border cooperation on energy distribution at community level. The case study is located at the border between Spain and Portugal, in the proximity of the city of Zamora in Spain (Manzanal de Arriba). The initiative is led by the European Grouping of Territorial Cooperation¹ Douro-Douro² that has realised the first EU Energy cooperative: **Efiduero**³. The cooperative is the key enabler of the initiative as will be explained in this case study.

¹EGTCs are legal entities binding together legal entities from different (bordering) Member States. More information about EGTCs can be found at: https://ec.europa.eu/regional_policy/policy/cooperation/european-territorial/european-grouping-territorial-cooperation_en

² More information available at: <https://duero-douro.com/>

³ More information available at: <https://efiduero.com/>

1.1. Location and geographical scope

The main technologies deployed in the initiative include photovoltaic rooftop installations and electric vehicle charging stations. As such, the area covered by the initiative is quite extensive. The EGTC name (Duero-Douro) derives from the translation of the main river of the region in both Portuguese and Spanish. However, the very first PV installations realised by the EGTC were in Manzanal de Arriba (Zamora, Spain). Figure 1 on the right shows the satellite location of the first PV installation in Manzanal, at the border between Portugal and Spain.

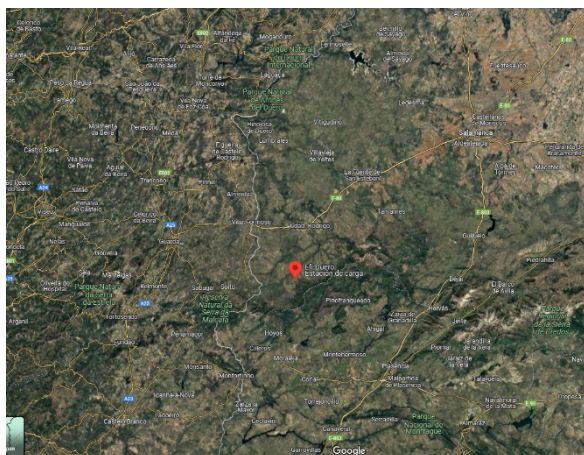


Figure 1: Area of operation of Efiduero, Source: Google maps screenshot.

However, as it will be demonstrated throughout this document, the scope of activities and the ambition of the EGTC go beyond a single municipality in this cross-border area but rather look at the Duero-Douro region as a whole cross-border community to be gradually embodied in this collective energy project.

The key legal entity behind this initiative (the Duero-Douro EGTC) covers a total of 5 NUTS3 level regions between Spain and Portugal:

Spain

- Salamanca (ES415)
- Zamora (ES419)

Portugal

- Douro (PT11D)
- Terras de Trás-os-Montes (PT11E)
- Beiras e Serra da Estrela (PT196)



Figure 2: NUTS3 regions covered by EGTC Duero-Douro, source: own elaboration.

Finally, the EGTC has its headquarters in two municipalities in the area: Trabanca (Salamanca, Spain) and Bempesta (Mogadouro, Portugal).

1.2. Foundation & history

The European Grouping of Territorial Cooperation of Duero Douro was established in 2009. The entity was born to absorb and represent the needs and requests of a remote (and rural) area encompassing the territories of two EU member states. Notwithstanding the different national identities of its inhabitants (including language, culture and history), the cross-border area of Duero Douro is characterised by a common heritage that goes beyond the geographical border separating both countries. Hence, creating a legal entity capable of acting as a facilitator within the territory was necessary to bridge the gap between the countries and appreciated by citizens on both sides of the border. As such, the EGTC's key goal was to support the over 200 municipalities of the area in overcoming the typical barriers faced by a rural cross-border territory (i.e. intermittent energy supply and connection with national grid, access to EU funding to develop its infrastructure, etc...). In doing so, the EGTC promoted various projects to help the citizens and municipalities of Duero-Douro. All of these were developed under the key initiative "Energy for the people (*Energiaporaelpueblo*)"⁴ focusing on energy independence.

⁴ More information available here: <https://energiaporaelpueblo.com/>

The first milestone of the journey started in **2013**, with a pilot project on improving the energy efficiency of the public lighting systems of 175 municipalities of the area⁵, resulting in 85% savings in energy consumption and a change in the management model. It established a single contract for the public lighting of all locations, which is under the overview of a joint commission composed of members appointed by the different municipalities. In **2017**, the EGTC formed the European Energy Cooperative “Efiduero”⁶ with the objective of producing, distributing and consuming energy within the territory of Duero Douro. In fact, as will be explained in section 2.4, this is an innovative approach given that “Efiduero” is registered as an official energy provider and became the main supplier in the area within a couple of years. Since then, several PV-based self-consumption projects were implemented (under the umbrella of “Energia para el pueblo” (2020 in Manzanal de Arriba and between 2021-2023 in Fronteira). Furthermore, since **2024** the Efiduero cooperative is active in the installation of charging stations for electric vehicles in the territory and plans to explore innovative energy solutions in the hydrogen domain for the cross-border area⁷. These include ideas to produce green hydrogen from PV energy and installing 4 facilities in Spain and 4 in Portugal, following the Green Hydrogen Corridor⁸ (CelZa project).

Hence, over time, the scope of “Energia para el pueblo” has been broadened and – under its umbrella – several **Oficinas de Transformación Comunitaria (OTCs)**⁹ have been established in the Duero Douro territory. An OTC is a local One Stop-Shop for energy communities, introduced by the government in late 2023 and provides services such as technical support, administrative and legal advice and economic/financial assessment. In the forthcoming period, Efiduero aims to double the total number of facilities installed in the territory, by reaching the potential of 7100 kW of installed power.

1.3. Energy technologies applied

The Efiduero energy cooperative deploys two main energy technologies: **Solar PVs** and **electric vehicle charging stations**. The project “Energia para el pueblo” started in 2020 and the installations in the territory were completed in 3 different phases:

- Phase 1: 40 PV installations of 15.75 kWp
- Phase 2: additional 43 PV installations of 15 kWp
- Phase 3: additional 26 PV installations ranging from 16.2 kWp up to 103.5 kWp

This adds up to a total number of 109 PV installations that are property of the Efiduero EU Energy Cooperative. It is important to underline that, currently, all installations are located on the

Spanish side of the border, given that the administrative process to be registered as an official electricity provider is quicker in Spain than it is in Portugal. In fact, on the Portuguese side of the border, no PV installations have yet been installed, even though the permitting procedures were initiated at the same time as on the Spanish side.

Additionally, Efiduero has installed over 20 charging stations for electric vehicles in the territory of Duero-Douro (mainly in the Spanish territory). The installed stations have an average power



Figure 4: Duero-Douro charging stations, Source: Efiduero

⁵ [website](https://www.efiduero.com/)

5

⁶ More information available here: <https://efiduero.com/>

⁷ Findings from the RECAH workshop in Zamora on cross-border energy communities between Spain and Portugal. More information available here: https://wayback.archive-it.org/12090/20240322151538/https://rural-energy-community-hub.ec.europa.eu/summary-comparative-assessment-cross-border-workshops_en

⁸ More information available here: <https://www.ren.pt/en-gb/activity/main-projects/celza-and-the-national-hydrogen-transport-hub>

⁹ More information available here: <https://oficinadetransformacioncomunitaria.es/>

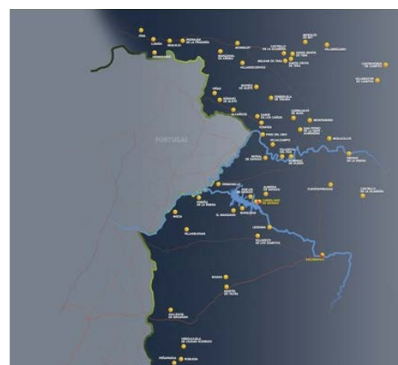


Figure 3: PV installations Duero-Douro, Source: RECAH workshop on Cross-Border Energy Communities.

otecadigital.ipb.pt/entities/publication/215a4883-3502-4612-a568-

of 22 kW and 2 connection points, hence, allowing simultaneous charging of 2 vehicles at each of the stations.

1.4. National/regional enabling frameworks and policies

There are several legal considerations to be made in the description of this case study. First, the EGTC Duero-Douro was established under the Regulation 1302/2013 (improving Regulation 1082/2006) of the European Parliament and of the Council on European Groupings of Territorial Cooperation¹⁰. This regulation offers a common legal framework that facilitates cooperation, especially for managing EU-funded projects like INTERREG programmes¹¹. The Regulation provides more autonomy and a stronger legal basis to facilitate cross-border cooperation. At the Member State level, EGTCs need to be established by national legislation. For Duero-Douro it is the case in Spain with the Royal Decree 37/2008¹² and in Portugal with the Decree Law 376/2007¹³.

Secondly, once the EU energy cooperative “Efiduero” was created, it needed to register as an official recognised provider in both Member States (Spain and Portugal). The respective process for registering a new electricity provider is outlined in Table 1. This has inevitably hindered the full deployment of the “Efiduero”’s activities. In fact, whereas in Spain the process takes up to 4 months, in Portugal the registration phase is a longer process, which may take more than 1.5 years, and which involves negotiations and contact with different entities responsible for the set-up of the national electricity market landscape. As a result, the cooperative quickly finalised its official establishment and ability to operate on the Spanish side the border, while the Portuguese authorities are still analysing its documentation.

Table 1: Process for formally registering the cooperative in Spain and Portugal. Source: RECAH workshop on Cross-Border Energy Communities.

Spain	Portugal
1. Establishment of the SME	1. Registration of Energy Marketing Activity It is the responsibility of the Directorate General of Energy and Geology (DGEG) to register this activity. In order to apply for an Energy Trading License you must (i) demonstrate capacity, technical and economic suitability to operate in the markets. (ii) Pay the fee for issuing the Application for the registration of the activity of commercialization of electric energy (1000 EUR)
2. Accreditation technical and economic capacity (registering through “Red Electrica de España ¹⁴ ” - REE or through “Operador del Mercado Ibérico Polo Español ¹⁵ ” – OMIE)	2. Obtaining Market Agent Status (MAS) Obtaining the MAS within the scope of the Global System Management (GGS) takes effect when the signing of a Contract with the concessionaire entity of the National Transport Network (RNT), National Electricity Network (REN) enters into force. To do this you need a minimum bank guarantee of 100 000.000 EUR
3. Communication of the activity as provider through the Ministry of Industry, Commerce and Tourism	3. Registration as a Market Agent Market Agent registration is carried out with the designated Electricity Market Operator (OMIE) and is valid throughout the Iberian Peninsula.

¹⁰ More information available here: <https://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=CELEX:32013R1302>

¹¹ This cooperation before the establishment of EGTCs was hindered by the different legal frameworks and administrative systems present in the various Member States.

¹² More information available here: <https://www.boe.es/boe/dias/2008/01/19/pdfs/A04156-04158.pdf>

¹³ More information available here: https://pgdilisboa.pt/leis/lei_mostra_articulado.php?nid=2275&tabela=leis&so_miolo=

¹⁴ More information available here: <https://www.ree.es/es>

¹⁵ More information available here: <https://www.omie.es/>

Spain	Portugal
4. Communication of the activities at the National Committee for Markets and Competition (CNMC). Registering and obtaining the operational R2 code	4. Distribution Network Usage Agreement
5. Discharged the Identification Code for Electricity (CIE) at the Tax Agency	5. Registration on the Change of Supplier Platform
6. Demonstrate and obtain a guarantee of at least 10 000 EUR in the REE (manages both the Official Future and Options Market – MEFF) and in the OMIE (11 days before the forecasted consumption	Registration is done through the Change of Supplier Logistics Operator (OLMC). ADENE – Energy Agency is the national entity responsible for carrying out OLMC activities, with the scope of the National Electric System (SEN).
7. Manage discharges with distributors	
8. Set-up a software to manage Universal Supply Point Codes (CUPS), billings, hourly measures ¹⁶ .	
9. The overall process takes up to 4 months	

2. Governance and internal organisation

The chapter will start with a brief introduction on the governance model of the EGTC Duero-Douro, given its relevance for understanding the whole project of “Efiduero”. Then, it summarises how the energy cooperative’s governance is organised, followed by an elaboration of the applied business model and key funding sources, which define its financial operations.

2.1. Governance model

Before characterising the cooperative model itself, it is necessary to shortly summarise how the EGTC is organised. As such, the EGTC is a cross-border entity established to enhance collaboration between public entities in Spain and Portugal. The EGTC possesses its own legal capacity to act both in Spain and Portugal. It operates on a non-profit basis, focusing on fostering and developing cross-border, transnational and interregional cooperation among its members to strengthen economic and social cohesion.

The EGTC comprises 188 public entities located in the NUTS III subregions of Portugal and Spain (see section above). Its members include 107 municipalities, 7 municipal councils, 69 Portuguese cross-border parishes, 2 municipal associations, 1 autonomous body and 2 academic entities; the University of Salamanca and the Bragança Polytechnic Institute.

The EGTC is authorised to manage and implement programmes, subprogrammes or initiatives supported by Community funds. This includes acquiring or disposing of assets, employing personnel, and representing itself legally. The EGTC’s activities are governed by its Articles of Association and Regulatory Agreement, with Spanish legislation applying due to the location of its registered office in Trabanca, Salamanca. Additionally, the EGTC integrates Community law and relevant Portuguese law, especially concerning the exercise of national constitutional rights.

Given the above, the EGTC was able to give birth to the “Efiduero” energy cooperative to act as a key energy provider (“comercializadora”) for the region. As such, the cooperative follows the same structure as other cooperatives in Spain, consisting of:

Democratic Decision-Making

- One Member, One Vote: Regardless of how much energy a member consumes or contributes, each member has an equal vote.
- General Assembly: The highest decision-making body, where major policies, budgets, and strategic decisions are approved by a majority of the members.

¹⁶ For this aspect, EFIDUERO contacted an external consulting company

- Transparency & Participation: Members have access to financial reports and operational details.

Governing Bodies

- General Assembly: Composed of all members and meeting periodically to make key decisions and elect representatives.
- Board of Directors: A group of elected members responsible for managing daily operations and implementing decisions from the assembly.
- Supervisory Committee (if applicable): Some cooperatives have an oversight body to ensure compliance with regulations and ethical standards.

Decision-Making Process

- Consensus-Oriented: While majority voting is standard, cooperatives often aim for broad agreement among members.
- Regular Meetings: Typically held annually or semi-annually, with special meetings convened if needed.
- Member Proposals: Any member can propose initiatives, which are then discussed and voted on in the General Assembly.

2.2. Key actors and stakeholders

There are different key actors involved in the cooperative “Efiduero”. The most important ones are the EGTC Duero-Douro and the members of the cooperative. Membership is open to individual and legal entities, both public and private, who are either resident in the territory or property owners of a Distribution Point in the area covered by the cooperative. To become a member, an individual or entity must submit a formal application and make a one-time contribution of 50 EUR. This one-time fee includes 20 EUR towards the share capital of the cooperative, 25 EUR for management expenses and a 5 EUR registration fee.

As such, this can be considered open for inclusive membership as entry fees are relatively low compared to other cooperatives and energy communities in Spain and Portugal. This allows for a diverse range of stakeholders to participate in and benefit from the cooperative’s initiatives. These include:

- Municipalities of the Duero-Douro area
- The EGTC Duero-Douro
- The University of Salamanca
- Citizens

2.3. Business model

Aside from the membership fee, participants in the cooperative’s activities are not required to invest more money in “Efiduero”. The key aspect of Efiduero’s business model lays in the participation of Santander Bank¹⁷ in the activities of the cooperative.

The bank guaranteed the initial investment of 10 000 EUR required by Spanish legislation to register as an official electricity provider on a determined territory (see table 1 above). This initial loan provided by Santander was repaid by Efiduero throughout the years with the surpluses of energy re-sold to the market to Spanish energy providers active in the area such as Iberdrola and Endesa.

Moreover, the concept of “Efiduero” is to enhance self-consumption and contributing to the net-emission energy system of the Duero-Douro territory. Since the beginning of its activities, the cooperative did not envision to distribute profits from the selling of energy to its members. The cooperative and the “*Energiaparaelpueblo*” project were elaborated as large-scale collective self-consumption schemes with surpluses and without compensation.

As such, their business model functions as follows:

1. The PV installations are official property of the EGTC Duero-Douro, who is the official energy producer
2. Efiduero Energy SCEL commercialises energy and distributes it via the existing electricity network.

¹⁷ More information available here: <https://www.laopiniondezamora.es/comarcas/2024/05/13/efiduero-energy-energia-despoblacion-102282817.html>

3. Municipalities and members of the cooperative benefit from the clean energy produced at a slightly lower market price (compared to national standards)

As a final point on their business model, “Efiduero” also acts as a local One-Stop Shop for energy community in the territory of Duero Douro. The cooperative is in fact engaged in supporting emerging energy communities in securing funding from the national support for projects called “CE Implementa¹⁸”. Currently “Efiduero” has managed to leverage 2 170 442 EUR of funding from this call, supporting the realisation of 106 PV installations.

2.4. Grid connection

“Efiduero” uses the general electricity grid in its region. All electricity it produces through its PV installations is injected into the existing energy transport network, without additional costs or bureaucratic/administrative efforts.

As mentioned above, “Efiduero” is established as an energy provider for the Duero-Douro territory with the access to the energy grid at the same conditions as other energy providers. Given this configuration, its access to the local grid infrastructure was not hindered by any particular barrier, nor did it need to establish new grid infrastructure in the territory.

2.5. Access to finance

“Efiduero” leveraged funding for two main purposes (as shown above):

- Bank guarantee of 10 000 EUR from Santander Bank to ensure registration as an electricity provider in the Spanish territory.
- “Efiduero” established itself as a One-Stop Shop (“Oficina de Transformación Comunitaria”) and managed to leverage funding from the national call for support (“CE implementa”) to realise several RE installations (PV) in the territory of Duero-Douro.

3. Impact and Analysis

The activities conducted by the “Efiduero” energy cooperative have a strong impact on the Duero-Douro region, driving positive change across social, environmental and economic dimensions. By fostering community engagement, reducing carbon emissions and promoting economic resilience, the cooperative serves as a model for sustainable energy cooperatives. Its initiatives demonstrate that localised, community-driven approaches can effectively address contemporary energy challenges while strengthening regional development.

3.1. Social, environmental, and economic impacts

Social impacts

The “Efiduero” cooperative model strengthens social cohesion by actively involving local communities in energy production and decision-making. By allowing individuals, businesses, and municipalities to participate as members, it fosters a sense of ownership and collective responsibility.

One of the most notable social benefits is the democratisation of energy access. The cooperative offers more affordable electricity rates compared to traditional providers, fostering the access to energy in rural and economically vulnerable areas like Duero-Douro. Additionally, educational initiatives and awareness campaigns have helped communities understand the benefits of renewable energy, leading to increased participation and advocacy for sustainable practices.

Moreover, the cooperative has reinforced local governance by encouraging collaboration between municipalities and citizens. This has improved regional planning and coordination, fostering a culture of transparency and shared decision-making.

Environmental impacts

The cooperative’s commitment to sustainability directly contributes to reducing carbon emissions and promoting renewable energy sources. By developing local photovoltaic, wind and biomass projects, the cooperative significantly reduces reliance on fossil fuels, leading to a cleaner and more sustainable energy mix in the region.

¹⁸ More information available here: <https://efiduero.com/proyecto-ce-implementa/>

A key achievement is the reduction of greenhouse gas emissions through the widespread adoption of solar and other renewable energy technologies. The cooperative's projects have also contributed to enhanced biodiversity protection by promoting sustainable land use practices that prevent environmental degradation.

Additionally, “Efiduero” encourages energy efficiency measures, supporting members in adopting smart energy solutions such as energy storage systems, smart grids and consumption monitoring tools. These initiatives help optimise energy use and minimise waste, reinforcing long-term sustainability goals.

Economic impacts

The cooperative generates substantial economic benefits by creating new employment opportunities and supporting local businesses. “Efiduero” has stimulated job creation in sectors such as renewable energy installation, maintenance and technical support. These opportunities particularly benefit younger generations, providing them with incentives to stay in the region rather than seeking employment elsewhere.

By reducing energy costs for households and businesses, the cooperative improves economic resilience, allowing local enterprises to reinvest savings into their operations.

“Efiduero” reduces economic dependence on large external energy providers, ensuring that financial resources remain within the local economy. This decentralised energy model enhances financial stability for municipalities, making them less vulnerable to fluctuations in global energy markets.

3.2. Innovativeness

“Efiduero” stands out as an innovative initiative due to its pioneering approach as a local energy cooperative led by an EGTC. This cross-border governance model enhances collaboration and resource-sharing between municipalities in Spain and Portugal, setting a precedent for other regions seeking sustainable energy solutions. However, it must be noted that an energy sharing exchange activities between the two bordering territories has not yet taken place, given the different regulatory frameworks presented in Table 1 above.

Nevertheless, the “Efiduero” cooperative is a novelty in the landscape of energy communities in the EU, confirming once again that the approach of realising an energy cooperative is one of the most efficient approaches to start the process of empowering the local territory in its energy transition. In fact, especially in Spain and other EU Member states, the cooperative form is showcased as one of the most successful in bridging the gap between citizens/communities and the energy market.

Another key innovative feature of the “Efiduero” project is the establishment of the “Oficina de Transición Comunitaria (OTC)”, a one stop-shop designed to assist communities in transitioning to renewable energy. The OTC provides technical assistance, financial guidance, and community engagement strategies, ensuring a smoother shift towards local energy autonomy.

3.3. Key drivers for success

A series of elements are worth noting in the successful example of Duero-Douro. In fact, the elements of the local practice analysed in this case study are several and merit an overall summary showing the key successful elements of the Duero-Douro case.

Local cross-border context/environment favouring cooperative mechanisms and bottom-up initiatives.

This case study emphasises the presence of cooperative mechanisms and collaborative dynamics amongst the municipalities of a territory (in this specific case a cross-border region) is a key driver for the success of bottom-up initiatives, or projects which aim to put citizens and local communities at their centre. The territory of Duero-Douro counts on a long-standing history of cooperation between Spain and Portugal which also have materialised in recent years with several INTERREG Cross-Border projects being realised between both territories¹⁹. As such, this pre-existing fertile context of cooperation amongst both territories, facilitated the engagement of local citizens in the region, ultimately resulting in overall support for the energy cooperative.

The presence of a cross-border legal entity such as an EGTC efficiently catalyses and represents the requests of a specific territory

¹⁹ More information available here: <https://www.interregeurope.eu/good-practices/duero-douro-transnational-route>

The rationale behind the establishment of the European Groupings of Territorial Cooperation in EU cross-border territories was to avoid underrepresentation of the requests these regions would raise at national/EU level and enable a specific, tailor-made entity to better manage, collect and represent these cross-border areas at the EU and national level. As such, the EGTC Duero-Douro and its administrative structure and objectives facilitated the realisation of the “Efiduero” project thereby guaranteeing a platform for citizens and municipalities to feel listened and understood as well as a tailor-made local solution for the energy security of supply of the area.

Becoming an energy provider facilitates the establishment of energy cooperatives and energy community projects

The legal form chosen by the EGTC in the set-up of the “Efiduero SCEL” is the most important driver of this case study. In fact, setting up a cooperative entitled of distributing and selling the energy in the territory showed to be an important driver

3.4. Replicability and transferability

The Duero-Douro (quasi-)cross-border energy community model provides key insights into how decentralised energy markets can be developed in border regions. While its success is tied to specific legal, geographical, and socio-economic factors, the model presents significant potential for replication and transferability to other EU border areas.

Replication

Legal and Institutional Frameworks

The presence of the EGTC Duero-Douro was instrumental in overcoming regulatory challenges. Similar cross-border legal entities (e.g., EGTCs or bilateral agreements) should be established in other regions to facilitate energy cooperation.

Community Engagement and Cooperative Culture:

The project benefited from a strong local cooperative tradition. Other border regions with similar community-driven initiatives can leverage this cultural factor to build energy communities.

Supportive Financing Mechanisms:

The use of Interreg, local bank guarantees, and EU funding programs (CE Implementa, POCTEP) enabled financial sustainability. Future projects should explore cross-border financial mechanisms, including joint investment funds and shared energy tariffs.

Infrastructure and Grid Integration:

Efiduero’s ability to integrate into the existing grid was a key success factor. Replicating this model requires robust legal and technical planning to streamline grid access for new cross-border energy communities.

Policy and Administrative Harmonisation:

The different regulatory approval times in Spain and Portugal posed challenges. Other regions should push for regulatory sandboxes and harmonised permitting processes for cross-border energy sharing.

Transferability

Geographical and Socioeconomic Factors:

The model is best suited for rural and underdeveloped border regions where energy access and local economic development are priorities. Urban border areas may require different energy-sharing models.

Regulatory Alignment:

The degree of alignment between national energy policies will impact transferability. Countries with interconnected energy markets (e.g., France-Germany, Belgium-Netherlands) may face fewer legal barriers than others.

Institutional Capacity:

Success depends on strong governance structures, such as EGTCs or cross-border municipal networks. A lack of institutional collaboration could hinder transferability.

3.5. Main takeaways and recommendations

Takeaways and recommendations on the local practice of Cross-border (quasi-) energy community

Strengthen EGTC and Municipal Cooperation

EGTCs provide an effective governance structure for cross-border energy projects. Future projects should advocate for stronger mandates and streamlined regulatory pathways for EGTC-led energy initiatives.

Promote Flexible Legal Frameworks for Cross-Border Energy Trading

National governments and the EU should harmonise permitting procedures and explore bilateral agreements to facilitate energy distribution between bordering regions.

Enhance Financial Support and Incentives for Cross-Border Projects

Expand funding for pilot projects through Interreg, Horizon Europe, and Just Transition Funds, ensuring targeted support for energy communities in rural border regions.

Improve Grid Access and Infrastructure Coordination

Develop standardised interconnection agreements for cross-border energy sharing and create incentives for grid operators to support decentralised, community-driven projects.

Leverage Energy Cooperatives for Socioeconomic Development

Efiduero demonstrated that local ownership fosters economic resilience. Policies should incentivise cooperative-led energy projects, particularly in depopulated border areas.

Facilitate Knowledge Transfer and Capacity Building

Establish cross-border learning platforms and technical assistance programs for municipalities, cooperatives, and local energy initiatives.

Encourage Innovation in Renewable Energy Integration

Future projects should explore innovative models such as peer-to-peer energy trading, hydrogen production, and storage solutions for cross-border energy resilience.

Other takeaways and recommendations

Strategic Cross-Border Planning

The success of Efiduero highlights the importance of long-term energy planning at the cross-border level. National and EU strategies should prioritise energy independence for remote border regions.

Citizen and SME Involvement

Policies should encourage broad citizen participation and SME-led renewable initiatives, ensuring local benefits and engagement.

Digitalisation and Smart Grids

Expanding smart grid solutions can optimise cross-border energy flows and enhance efficiency.

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 and from other public sources.

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The ESPON EGTC is the Single Beneficiary of the ESPON 2030 Cooperation Programme. The Single Operation within the programme is implemented by the ESPON EGTC and co-financed by the European Regional Development Fund, the EU Member States and the Partner States, Iceland, Liechtenstein, Norway, and Switzerland.

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