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WESHARE

D1.1 Repository of the existing framework for energy collaboration in the industrial sector

Empowering businesses in Europe to
develop energy community models
for a successful energy transition

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#WESHARE

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Table of Contents

<i>Executive Summary</i>	5
<i>Background</i>	5
WESHARE project	5
Objective WP 1.....	5
Description D 1.1	5
<i>INTRODUCTION</i>	6
Purpose and scope of the repository	6
Opportunities for collaboration among businesses in business parks	7
<i>EXISTING EUROPEAN FRAMEWORK FOR ENERGY COLLABORATION IN THE INDUSTRY SECTOR</i>	9
Regulatory framework	9
Support framework	11
Differentiated Impact on Businesses vs. Households	12
<i>EXISTING NATIONAL FRAMEWORKS FOR ENERGY COLLABORATION IN THE INDUSTRY SECTOR</i>	13
Introduction	13
National frameworks for energy sharing	13
Belgium (Flanders)	13
Italy	14
Portugal	14
Spain.....	15
Conclusion	16
Impact on SME's	16
National framework for energy performance	17
Impact of ETS	18
<i>INVENTORY OF THE EXISTING BARRIERS</i>	19
Regulatory uncertainty and fragmentation	19
Structural limitations of local distribution grids	21
Administrative and operational complexity	21
Financial barriers	22
Awareness and coordination challenges	22
<i>Appendix: national frameworks</i>	24

List of Tables

Table 1: EU financial support mechanisms for collaborative energy projects
Table 2: EU regulatory and technical support mechanisms for business energy collaboration
Table 3: Impact of EU directives on businesses vs households
Table 4: Existing regulatory framework in the Demo states:
Table 5: Comparative overview of CSC outside RECs/CECs

Table of Acronyms

AFIR	Alternative Fuels Infrastructure Regulations
BM	Business Model
CBAM	Carbon Border Adjustment Mechanism
CCCE	Covenant of Companies for Climate and Energy
CCS	Carbon Capture and Storage
CEC	Citizens Energy Community
CEP	Clean Energy for All Europeans Package – Citizens Energy Package
CSC	Collective Self-Consumption
DSO	Distribution System Operator
EC	European Commission
EED	Energy Efficiency Directive
EIB	European Investment Bank
ELENA	European Local Energy Assistance
ENA	AGENCIA DE ENERGIA E AMBIENTE DA ARRABIDA
EPBD	Energy Performance of Buildings Directive
EPC	Energy Performance Certificate
ESR	Effort Sharing Regulations
EU	European Union
EU ETS	EU Emission Trading System
EV	Electrical Vehicle
GISA	Getafe Iniciativas SA
GSE	Gestore dei Servizi Energetici
IEMD	Internal Electricity Market Directive
MEPS	Minimum Energy Performance Standards
NZIA	Net Zero Industry Act
PPA	Power Purchase Agreement
R&D	Research and Development
REC	Renewable Energy Community
RED	Renewable Energy Directive
SME	Small and Medium Enterprise
SRI	Smart Readiness Indicator
WP	Work Package
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Executive Summary

This report provides a comprehensive overview of the existing frameworks for industrial energy collaboration within the EU, as developed under the WESHARE project. WESHARE supports the clean energy transition in European business parks by empowering businesses—especially SMEs—to engage in collaborative energy models such as energy communities, shared renewable production, and collective electrification.

The repository maps out the legal, organizational, and technical landscape, identifying both enablers and barriers. It reviews relevant EU directives, their national transposition in four demo countries (Belgium/Flanders, Italy, Portugal, Spain), and outlines key mechanisms like energy sharing, RECs/CECs, and support instruments.

While legal frameworks exist, SMEs face significant hurdles due to regulatory fragmentation, grid limitations, financial constraints, and a lack of practical tools and guidance. Key barriers identified include **unclear and fragmented regulation** across Member States, structural **limitations in local distribution grids, complex administrative and legal processes, limited financing options**, and **low awareness** among SMEs. Business parks offer great potential for joint decarbonization, but unlocking this requires simplified participation models, dedicated facilitation, and tailored financial and governance support. This report aims to inform future deliverables of WESHARE and contribute to a more inclusive and SME-accessible energy transition.

Background

WESHARE project

WESHARE supports the Clean Energy Transition (CET) of European business parks, by fostering energy collaborative approaches among companies. The consortium develops a full package of knowledge-based tools that provide insight into the energy collaboration potential of business parks. Unlocking the business parks energy transition, partners develop an innovative and scalable co-operative set of solutions, enabling the energy communities' set-up, the flexibility, etc. for making business areas less fossil-energy dependent and thus less pollutant in terms of carbon emissions.

Objective WP 1

The objective of WP 1 is to identify the different barriers for the development of efficient and successful energy cooperation and collaborative approaches for the industrial sector, to develop proposals to remove legal, organizational and social barriers for the concrete cooperation initiatives in the DEMO sites and to develop policy recommendations for the EU legislation.

Description D 1.1

The first deliverable in WP 1 is a repository of the existing framework for energy collaboration in the industrial sector. The repository analyses the existing EU legal framework and its translation into the national legislation of the demonstrators and inventories of the different organizational and social barriers for the demonstrators.

INTRODUCTION

Purpose and scope of the repository

The transition to a climate-neutral energy system requires a profound transformation of how energy is produced, distributed, and consumed within the European Union. This shift goes beyond technological innovation and demands a fundamental reorganization of the energy system itself. In this context, European legislation emphasizes the need for collective action and collaboration between citizens, businesses, and public actors.

With the *Clean Energy for All Europeans Package (CEP)*,¹ an integrated legislative framework was established that promotes not only renewable energy and energy efficiency, but also the active involvement of all energy system users. The directives within this package — including the Electricity Directive (EU) 2019/944, the Renewable Energy Directive (EU) 2018/2001 (RED II/III), and the more recent Directive (EU) 2024/1711 on electricity market reform — create new legal and economic opportunities for collaborative energy models. These include energy sharing, joint investments in renewable energy, and the establishment of energy communities.

For businesses, these developments offer opportunities to make their energy consumption more sustainable, control costs, and take on a more active role in the energy market. At the same time, they face a fragmented regulatory landscape, technical barriers, and administrative burdens that hinder their participation. This report examines to what extent the European regulatory framework specifically enables businesses to engage in forms of energy cooperation, and how this is implemented in practice in four member states: Flanders (Belgium), Spain, Portugal, and Italy.

The **Clean Industrial Deal**² proposal presents businesses with new opportunities for energy collaboration. By facilitating access to affordable energy, enhancing financing options, and simplifying regulations, these businesses can initiate joint ventures that bolster both their competitiveness and the broader energy transition.

Chapter 2 provides an overview of the key European directives and their relevant provisions regarding cooperation in the energy domain. Chapter 3 discusses how these directives have been transposed into national legislation in the four selected regions. Chapter 4 identifies and outlines the main obstacles SMEs encounter when setting up or participating in collaborative energy arrangements.

Although this report does not formulate policy recommendations, its findings offer a valuable foundation for future policy development and support measures aimed at small and medium-sized enterprises (SMEs) in the energy transition.

With this report, we aim to contribute to a better understanding of the legal and institutional context in which energy cooperation is developing for SMEs, and to encourage a more inclusive energy market in which smaller players can assume an active and meaningful role.

¹ [Clean energy for all Europeans package](#)

² [Clean Industrial Deal - European Commission](#)

Opportunities for collaboration among businesses in business parks

In 2022, the EU had 32.3 million enterprises, of that total, 99% were micro and small enterprises employing up to 49 persons, medium-sized enterprises (50-249 persons employed) represented 0.8% and large enterprises (more than 249 persons employed) represented 0.2% of the total number of enterprises³.

Although specific figures per business park are lacking, it is plausible that SMEs constitute the majority of companies in European business parks, given their overall dominance in the business landscape. The exact ratio between SMEs and large companies in a specific business park is influenced by local conditions, sectoral focus, and regional policy measures.

SMEs aiming to establish energy collaborations within business parks face several challenges, including limited access to information and expertise, financial constraints, complex regulatory environments, resource scarcity, coordination and trust issues among diverse participants, and limited awareness of available opportunities and benefits.

Larger corporations often possess greater financial resources, technical expertise, and infrastructure, which can enhance the scale and effectiveness of joint energy projects. However, their involvement may also introduce complexities related to governance, decision-making, and equitable benefit distribution.

Reaching carbon neutrality as a business park calls for more than individual action. Collaboration between businesses creates scale, efficiency, and innovation. By working together, companies can decarbonize their energy use, reduce emissions in mobility and heat, and take joint steps toward a climate-neutral future. Key opportunities for collaboration are:

- **Local energy communities**

One of the most effective frameworks for carbon-neutral collaboration is the creation of an **energy community**. These cooperative structures, enabled by EU legislation, allow businesses to jointly invest in, manage, and share renewable energy.

Key benefits include:

- **Joint renewable energy production and self-consumption**, reducing reliance on fossil-based grid electricity.
- **Shared ownership** of infrastructure such as solar panels, wind turbines, or battery systems.
- **Legal structure for peer-to-peer energy exchange**, optimizing use across diverse consumption profiles.
- **Improved access to subsidies and pilot programs**, thanks to the collective scale and visibility of the initiative.

Energy communities foster a culture of shared responsibility and allow companies to move beyond individual sustainability efforts.

- **Shared renewable energy production**

Business parks often have untapped potential for on-site renewable energy generation. Through collaboration, companies can co-invest in:

- **Solar photovoltaic installations** on rooftops, parking lots, or underutilized land.

³ [Clean energy for all Europeans package](#)

- **Wind turbines** within or near the park.
- **Battery storage systems** to balance production and demand, reducing peak grid reliance.
- **Off-site renewable energy through joint Power Purchase Agreements (PPAs)**, securing long-term access to green electricity.

These shared systems allow for better use of available space and resources, while also lowering the barrier to entry for smaller businesses

- **Collective electrification**

The shift from fossil fuels to electricity is a cornerstone of the carbon-neutral transition. Businesses can jointly plan and implement electrification strategies for:

- **Heating and cooling systems** (e.g., heat pumps, electric boilers).
- **Industrial processes** that can be electrified or hybridized.
- **Electric vehicle (EV) charging infrastructure**, including for logistics and employee transport.

Where grid capacity is limited, companies can coordinate grid reinforcement planning in partnership with the local distribution system operator (DSO) or can decide to jointly invest in a local micro grid owned by the business park.

- **Carbon-neutral heat networks**

Heat represents a major source of emissions in business parks. By collaborating, companies can develop or connect to **low-carbon heat networks**, using:

- **Residual heat** from industrial processes or data centers.
- **Renewable heat sources**, such as geothermal, aqua thermal, or solar thermal.
- **Temperature cascading**, where waste heat from one company meets the lower heat demand of another.

Matching complementary thermal profiles across companies can significantly improve efficiency and reduce emissions

- **Smart energy management and efficiency**

Carbon neutrality is not only about switching sources but also about **using less energy**. Parks can benefit from:

- **Shared energy audits and renovation plans**, leading to improved insulation and system upgrades.
- **A common energy monitoring system** to detect inefficiencies and benchmark performance.
- **Smart control technologies** to align energy use with renewable availability and reduce peak demand.

Data-driven collaboration helps ensure that investments deliver real emissions reductions.

- **Joint governance & planning**

- Setting up a **carbon-neutral roadmap** with shared targets, milestones, and decision-making structures.
- Establishing a **business park energy board** or **cooperative structure** to manage common assets and projects.

- Engaging with local governments, utilities, and community organizations to have better access to subsidies, technical support
- Applying jointly for grants and subsidies, leveraging scale and alignment with EU, national, or regional climate targets.
- Governance models of business parks should be inclusive, transparent, and aligned with each participant's strategic goals. They can be considered as a catalyst for the development of the different initiatives.

EXISTING EUROPEAN FRAMEWORK FOR ENERGY COLLABORATION IN THE INDUSTRY SECTOR

Regulatory framework

The European Green Deal sets out the EU's commitment to becoming the first climate-neutral continent by 2050, while ensuring a just and inclusive transition for all. It outlines a broad strategy to reduce greenhouse gas emissions, increase energy efficiency, and accelerate the deployment of renewable energy across all sectors of the economy⁴.

The Green Deal emphasizes the importance of local action, decentralized energy systems, and collaborative approaches to sustainability. It recognizes the crucial role of SMEs, industrial actors, and businesses in this transition, both as energy users and as drivers of innovation and investment⁵.

These ambitions are being translated into binding legislation through the Fit for 55 package, which includes revisions to the Renewable Energy Directive⁶ (RED), the Energy Efficiency Directive⁷ (EED), and the Internal Electricity Market Directive⁸ (IEMD). These legal instruments provide the framework, rights, and incentives for businesses — particularly those located in shared zones such as business parks — to engage in joint energy production, sharing, and efficiency initiatives.

In addition, the package includes a reform of the EU Emissions Trading System (EU ETS)⁹, which increases the carbon price signal for industry and phases out free allowances in key sectors. The introduction of the Carbon Border Adjustment Mechanism (CBAM)¹⁰ ensures a level playing field by applying a carbon price to imported goods in carbon-intensive sectors such as steel and aluminum, indirectly influencing procurement and supply chains for many businesses.

⁴ European Commission (2019). *The European Green Deal*, COM(2019) 640 final.

⁵ Ibid., pp. 7–8.

⁶ Directive (EU) 2018/2001 on the promotion of the use of energy from renewable sources (RED II), as amended by Directive (EU) 2023/2413 (RED III).

⁷ Directive (EU) 2012/27/EU on energy efficiency, revised by Directive (EU) 2023/1791

⁸ **Directive (EU) 2024/1711** of the European Parliament and of the Council of 13 June 2024 amending Directives (EU) 2018/2001 and (EU) 2019/944 as regards improving the Union's electricity market design.

⁹ Directive (EU) 2023/959 amending Directive 2003/87/EC establishing the EU Emissions Trading System (EU ETS).

¹⁰ Regulation (EU) 2023/956 establishing a Carbon Border Adjustment Mechanism (CBAM).

The Energy Performance of Buildings Directive (EPBD)¹¹, revised in 2024, introduces minimum energy performance standards and solar obligations for non-residential buildings. This directly affects businesses that own or lease commercial properties, particularly in relation to renovation and the deployment of on-site renewables. The Effort Sharing Regulation (ESR)¹² sets binding national targets for emissions reductions in sectors such as buildings, transport, and small industry, driving national policies that affect business operations at local level.

Finally, the Alternative Fuels Infrastructure Regulation (AFIR)¹³ mandates the rollout of EVcharging infrastructure across commercial and industrial zones, encouraging businesses to transition to low-emission mobility solutions and enabling collective investments in shared charging facilities.

Together, these legislative measures form a coherent policy framework that not only drives individual business action but also creates strong incentives for coordinated, place-based decarbonization efforts within business parks and industrial zones.

The **Net-Zero Industry Act (NZIA)**¹⁴, adopted in 2024, is a key pillar of the EU's Green Deal Industrial Plan and aims to scale up the EU's manufacturing capacity for **strategic net-zero technologies**. While its primary focus is on industrial competitiveness and clean-tech production, the NZIA also creates a favorable policy environment for **collaborative energy initiatives among businesses**. By introducing **streamlined permitting procedures**, supporting **joint investment platforms**, and designating **Net-Zero Strategic Projects**, the Act lowers regulatory and financial barriers for companies that wish to co-invest in clean energy solutions — such as shared renewables, storage, or carbon capture infrastructure. In addition, the creation of **Net-Zero Acceleration Valleys** encourages regional clusters of businesses and industries to develop integrated, cooperative approaches to decarbonization. As such, the NZIA reinforces and complements existing energy directives by **facilitating large-scale, cross-company energy projects** that are vital to achieving the EU's 2030 and 2050 climate targets.

Member States are required to **transpose this legislation into national law**, ensuring that businesses across Europe have access to the tools and regulatory certainty needed to act collectively in the energy transition. The analysis of the national frameworks will include the transposition of the EU legislation.

The forthcoming **Citizens' Energy Package (CEP)**¹⁵, proposed by the European Commission (EC) in **February 2025**, represents a significant opportunity to strengthen **local energy collaboration between businesses**. While primarily aimed at empowering citizens and communities, the package includes measures that are likely to benefit **SMEs and business clusters** seeking to participate in decentralized energy systems. By clarifying the legal framework for **energy communities**, simplifying administrative procedures, and improving access to local energy markets, the CEP could enable businesses in shared zones — such as business parks or industrial zones— to more easily **co-invest in renewable energy, share infrastructure**, and jointly manage **local energy flows**. The package is also expected to introduce digital tools and regulatory provisions to support **energy sharing and peer-to-peer exchange**, which would

¹¹ Directive (EU) 2024/1275 of the European Parliament and of the Council of 24 April 2024 on the energy performance of buildings (recast), OJ L 2024/1275, 8 May 2024.

¹² Regulation (EU) 2023/857 amending Regulation (EU) 2018/842 on binding annual greenhouse gas emission reductions by Member States (Effort Sharing Regulation – ESR).

¹³ Regulation (EU) 2023/1804 on the deployment of alternative fuels infrastructure (AFIR).

¹⁴ **Directive (EU) 2024/1659** of the European Parliament and of the Council of 11 April 2024 establishing a framework of measures for strengthening Europe's net-zero technology manufacturing ecosystem (Net-Zero Industry Act),

¹⁵ European Commission (2025). *Proposal for a Citizens' Energy Package*, COM(2025) 72 final, 21 February 2025.

significantly lower the transaction costs and complexity of collaborative models. If adopted and effectively transposed by Member States, the CEP could become a key lever to unlock **scalable, business-driven energy cooperation**, advancing both economic competitiveness and climate goals.

Support framework

To support the active role of businesses in the energy transition, the EU has developed a broad suite of **financial, regulatory, and technical support mechanisms**. These are designed not only to help individual companies decarbonize, but also to **enable collaboration between businesses** — particularly in shared environments such as business parks, industrial zones, and regional clusters.

The **financial instruments** provide grants, loans, guarantees, and blended finance to facilitate joint investments in renewable energy, efficiency measures, and clean infrastructure.

Instrument / Fund	Type of Support	Target Beneficiaries	Relevant Activities
Horizon Europe	Grants for R&D and innovation	Businesses, research institutions, clusters	Collaborative pilots, industrial symbiosis, energy sharing, smart energy systems
LIFE Clean Energy Transition	Grants for capacity building and replication	SMEs, cooperatives, local partnerships	Energy communities, renovation support, joint energy management
Innovation Fund	Grants for high-impact low-carbon projects	Large emitters, industrial clusters	Shared CCS, green hydrogen, clean heat infrastructure
InvestEU / EIB Support with ELENA	Loans, guarantees, blended finance	SMEs, project developers, public-private consortia	Efficiency upgrades, renewable installations, energy communities
Just Transition Fund (JTF)	Grants for transition regions	Businesses in carbon-intensive or coal regions	Energy hubs, clean tech deployment, reskilling linked to energy collaboration

Table 1 EU financial support mechanisms for collaborative energy projects

In parallel, the EU has put in place a robust regulatory and governance framework that recognizes and supports legal structures like EC's ensures access to financial aid, and provides practical assistance through knowledge platforms and capacity-building programs.

Mechanism / Framework	Type of Support	Target Beneficiaries	Relevant Applications
Renewable Energy Communities (RECs) (RED III)	Legal framework	SMEs, local actors, cooperatives	Joint renewable production, energy sharing, collective self-consumption
Citizen Energy Communities (CECs) (IEMD)	Legal framework	Citizens, SMEs, public entities	Peer-to-peer trading, grid participation, demand response
CEEAG 2022 (State Aid Guidelines)	Enables public funding	Businesses, cooperatives, energy community projects	Subsidies for joint renewables, storage, grids, and efficiency
European Energy Communities Repository	Technical assistance & mentoring	Local groups, SMEs, facilitators	Project setup, legal templates, replication support
ManagEnergy Initiative	Training & capacity building	Local/regional energy agencies, business facilitators	Skills development for energy cooperation and project design

Covenant of Companies for Climate and Energy (CCCCE)	Guidance benchmarking & SMEs, business networks	Climate action planning, progress tracking, funding navigation
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Table 2 EU regulatory and technical support mechanisms for business energy collaboration

Together, these mechanisms lower the financial and administrative barriers for businesses wishing to act collectively, and create the enabling conditions for scalable, place-based decarbonisation strategies aligned with the EU's climate goals.

Differentiated Impact on Businesses vs. Households

While the Fit for 55 package is designed to accelerate decarbonization across the entire economy, the impact of each regulation varies significantly between businesses and households. Some instruments impose direct obligations on companies (e.g., carbon pricing, infrastructure mandates), while others mainly target citizen behavior or offer general incentives. Understanding these differences is essential for identifying where business collaboration can play a leading role in achieving climate goals.

Directive / Regulation	Primary Target Group	Impact on Businesses	Impact on Households	Key Notes
EU ETS	Businesses	High – direct carbon pricing for industrial emitters, power plants, aviation	None	Strong incentive for industrial decarbonisation and clean investment
CBAM	Businesses	High – cost implications for importers and manufacturing supply chains	None	Encourages low-carbon sourcing and reshoring of production
RED III	Both	Medium-High – sectoral targets, energy communities, PPAs	Medium – support for self-consumption and local energy sharing	Enables business collaboration in renewable energy production
EED	Both	Medium – mandatory audits and energy management for large enterprises	Medium – access to renovation and savings incentives	Stronger obligations for business energy users
EPBD	Both	Medium – expected renovation and solar mandates for non-residential buildings	Medium – standards for residential performance and upgrades	High investment impact for commercial real estate
ESR	Both (via national policy)	Indirect – impacts via national transport, buildings, and heating policy	Indirect – influences building standards and energy taxes	Implementation varies by Member State
AFIR	Both	Medium – charging	Medium – increased access	Supports electrification of

		infrastructure obligations for fleet operators and business sites	to EV charging infrastructure	company and public mobility
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Table 3 Impact of EU directives on businesses vs households

EXISTING NATIONAL FRAMEWORKS FOR ENERGY COLLABORATION IN THE INDUSTRY SECTOR

Introduction

European directives are a central policy instrument through which the EU aims to align legislation across Member States in pursuit of common goals, particularly within the framework of the European Green Deal. In sectors such as energy, buildings, and transport, directives provide the legal basis for coordinated action on decarbonization, energy efficiency, and market integration. However, unlike EU regulations, directives are not directly applicable: they must first be transposed into national or regional legislation, typically within a defined implementation period—often two years.

This transposition process allows for national flexibility, meaning that each Member State can adapt the implementation of a directive to its own legal, political, and administrative context. As a result, significant differences arise in how and when EU directives take effect across the Union. This variation is particularly evident in areas such as energy sharing, energy performance of buildings and emissions trading for businesses.

This chapter examines the implementation of these directives across the Member States of the demo sites, with a focus on how differences in timing, scope, and regulatory detail impact national energy and climate policy landscapes and support the rollout of energy communities in the demos.

National frameworks for energy sharing

The BRIDGE Working Group on Regulation published a comprehensive update in March 2025¹⁶, assessing the implementation of energy sharing frameworks across 15 EU Member States. This report provides a comparative overview of national approaches, highlights regulatory barriers, and formulates practical recommendations to support the scale-up of citizen-led energy initiatives. The following section summarizes the regulatory landscape for energy sharing in Flanders, Italy, Portugal and Spain based on the corresponding national factsheet included in the BRIDGE report.

Belgium (Flanders)

In Flanders, the regulatory framework for energy sharing is fully implemented and aligns closely with the relevant EU directives. The legislation allows for three main types of energy sharing: community sharing, peer-to-peer (P2P) sharing, and third-party organized sharing.

¹⁶ BRIDGE Working Group on Regulation. *Report on Energy Sharing – Comparative Overview of Implementation in 15 EU Member States*. March 2025. European Commission, DG Energy.

Participation in energy sharing initiatives is open and flexible. While the regulation requires a geographical perimeter for RECs, it does not impose specific criteria—communities are responsible for defining this perimeter. Energy sharing is currently only permitted within the Flemish Region, with no provision for interregional arrangements.

The distribution system operator (DSO), Fluvius, plays a central role in enabling energy sharing. It provides a digital platform (myfluvius.be) where community managers register participants. Fluvius is responsible for measuring and allocating shared energy volumes and for sharing this data with community managers and with retail suppliers, who adjust consumer billing accordingly.

Retail suppliers maintain their standard billing roles but must incorporate shared energy data into customer invoices. Direct financial transactions for shared energy (e.g. compensation between participants) are settled privately. Retailers do not play an active role in these arrangements and often apply additional fees per connection point involved in energy sharing, which can be significant.

Energy sharing coefficients are defined ex ante and selected from a range of standard distribution keys offered by Fluvius. Community managers may opt for one of these keys or, in some cases, request a custom configuration.

Energy settlements are processed in 15-minute intervals, in line with EU metering standards.

Italy

Italy has implemented a comprehensive legal framework for energy sharing, aligned with EU directives and developed progressively through multiple regulatory instruments between 2021 and 2024. The framework enables both collective self-consumption within buildings (e.g. condominiums) and energy sharing within RECs.

Participation in RECs is permitted within the scope of a shared medium- or low-voltage (MV/LV) substation, with a maximum eligible generation capacity of 1 MW under a single primary substation to benefit from national incentives. There are no upper limits on the number of participants, but a minimum of one prosumer and one consumer is required.

The regulatory architecture is supported by several national institutions. The Gestore dei Servizi Energetici (GSE) oversees the administrative framework and incentive management, while the local DSOs ensure data collection and grid connection compliance. Smart metering is a prerequisite for participation, and the DSO is responsible for validating meter data and forwarding it to GSE and relevant suppliers.

Energy sharing coefficients are not regulated centrally. Each community or condominium determines internally how energy is to be allocated among its members. These agreements are not submitted to the DSO, providing a degree of flexibility, but also requiring internal coordination and administrative capacity.

Retail suppliers play a facilitative role, primarily in billing residual consumption, managing network charges and taxes, and relaying consumption data to GSE. However, they are not actively involved in the internal sharing or compensation mechanisms of energy communities.

Energy settlements are currently processed on an hourly basis, though a shift toward 15-minute intervals is anticipated in the near future.

Portugal

Portugal has developed a comprehensive legal framework for energy sharing, grounded in national legislation that transposes the EU RED and IEMD. Energy sharing is currently enabled through RECs and collective self-consumption (CSC) schemes.

Participation in energy sharing is subject to proximity requirements:

- REC members must either be located in the vicinity of the renewable energy installations or actively participate in related activities.
- Geographical boundaries are interpreted flexibly taking into consideration the voltage level of the distribution network where the members of the REC are connected.

At the operational level, DSOs oversee compliance and grid integration, including connection agreements and technical validations. Participants must have smart metering infrastructure installed, but the regulatory framework does not yet provide detailed guidance on energy sharing coefficients or allocation models—these are generally left to contractual agreement within the community.

Retail suppliers are not assigned a central role in managing energy sharing arrangements. Instead, RECs are responsible for organizing internal allocation and compensation schemes, including the redistribution of financial benefits among members. These arrangements are governed by private contracts.

Energy settlements are processed in 15-minute intervals, in line with EU metering standards.

Spain

Spain has established a functional and relatively mature regulatory framework for energy sharing, grounded in national legislation and aligned with EU directives. The system primarily enables CSC and RECs, with updated provisions reflecting the EU's revised IEMD.

Participation in collective energy sharing is subject to a geographical proximity criterion, generally defined as a 2000-meter radius between the point of generation and participating consumers. This limitation ensures localized grid benefits but may restrict larger-scale configurations. A derogation exists for rural municipalities and public bodies, allowing extensions up to 20 kilometers or 10 MW under specific conditions.

Spain mandates the use of smart meters for all participants. The DSO plays a central role in data collection, billing coordination, and the implementation of sharing arrangements. Each energy sharing group must designate a managing entity known as “representante del autoconsumo colectivo”, responsible for the registration process, defining sharing coefficients, and coordinating communication between participants and the DSO.

Energy sharing coefficients can take various forms:

- **Static** (fixed shares for each participant),
- **Dynamic** (changing based on consumption at each interval), or
- **Hybrid** models combining both approaches.

Since 2023, the default dynamic key (pro-rata by consumption) can be replaced by **fully dynamic custom keys**, developed by the DSO's. These keys allow greater control over allocation strategies and enable optimization based on pricing, priority consumption, or contractual agreements between participants.

Retail suppliers handle billing for residual consumption and collect relevant grid fees and taxes, based on the shared consumption data supplied by the DSO. Participants remain free to choose their supplier.

Since October 2024, energy settlements in Spain are processed in 15-minute intervals, in line with EU metering standards.

With a Royal Decree¹⁷ the Spanish government reacted in June 2025 on the blackout suffered on 28 April 2025. The main changes include an extension of CSC until 5 km from the production entity under certain conditions and a clearer role of the managing entity.

Conclusion

The transposition of EU directives on energy sharing—has produced varied outcomes across Flanders, Spain, Portugal, and Italy. While all four countries have formally embedded energy sharing in national legislation, their depth of implementation, operational readiness, and market accessibility differ significantly.

Flanders has developed a comprehensive digital and regulatory framework. The region offers a clearly defined structure for energy sharing via REC and CEC, including a functional registration platform (Fluvius), standardized allocation coefficients, and clear roles for DSOs and suppliers. However, financial and procedural barriers, including grid tariffs and supplier-imposed costs, still hinder uptake, particularly among smaller communities and SMEs.

Italy's transposition is robust and incentive-based, driven by clear guidelines and a national incentive scheme managed by GSE. Energy sharing is allowed within well-defined technical and geographical boundaries, and participants benefit from feed-in tariffs and grid fee discounts. Yet, complexity increases when third-party ownership is involved, and tax treatment of shared energy remains a challenge. Administrative burdens may deter community-led or SME-driven initiatives.

Portugal has a formally established legal framework, but operational implementation remains limited. While CSC is permitted, there is a lack of detailed procedures for energy allocation, participant registration, and supplier engagement. The absence of standardized sharing models or active support from DSOs results in slower uptake and more uncertainty for potential communities or SME groups. Recent reforms show progress, but practical roll-out lags behind. Regarding the participation of public entities in RECs, it faces significant legal obstacles, due to incompatibilities with public procurement rules and the legal framework governing local authorities' business activities, which have so far prevented the establishment of RECs involving public entities in Portugal.

Spain has developed one of the most advanced legal bases for energy sharing, with dynamic allocation keys, a designated managing entity, and growing uptake of RECs. However, technical and administrative complexity—especially for dynamic allocation—and dependence on well-resourced actors may limit participation by smaller citizens or SME groups. Financial incentives, such as reduced grid tariffs, help mitigate some of these barriers.

All four countries recognize and legally enable energy sharing in line with the EU requirements. Nevertheless key requirements are still inconsistently implemented and the ongoing transposition of RED III and IEMD 2024 should provide an excellent opportunity for alignment and clarification.

Impact on SME's

In all four countries, SMEs are legally permitted to join RECs and, in most cases, also CECs, provided they do not exercise dominant control. They do not need to own production facilities to participate, and existing

¹⁷ [BOE-A-2025-12857 Real Decreto-ley 7/2025, de 24 de junio, por el que se aprueban medidas urgentes para el refuerzo del sistema eléctrico.](#)

PV systems can be included in energy sharing arrangements under certain technical and contractual conditions. This opens clear legal pathways for SMEs, especially those located in business parks, industrial zones, or shared commercial premises, to reduce energy costs and participate in the local energy transition.

Yet, legal eligibility does not automatically translate into practical accessibility. In many cases, SMEs are confronted with complex registration procedures, unclear allocation rules, high grid connection fees, and the absence of streamlined governance models. In countries like Portugal and parts of Spain, operational frameworks are still emerging, while in Flanders and Italy, the digital and regulatory infrastructure is more advanced but often not tailored to the capacities of SMEs. As a result, SMEs frequently depend on external facilitators or cooperative initiatives to access energy sharing opportunities.

National framework for energy performance

The EPBD plays a central role in the European Union's strategy to decarbonize its building stock by 2050. By setting binding targets and minimum energy performance requirements, the directive drives deep renovation, the integration of renewable energy, and the rollout of smart technologies across all Member States. Its transposition into national and regional legislation has translated European ambitions into tangible obligations at local level. For SMEs particularly those operating in non-residential buildings, this legislative framework has direct implications. SMEs are increasingly required to comply with energy performance standards, undertake renovation measures, and invest in solar PV and electric mobility infrastructure.

The four countries have all transposed the core elements of the EPBD into national law—particularly regarding energy performance certification, public display obligations, and solar PV requirements. However, there is uneven progress in implementation depth, especially concerning renovation triggers, smart readiness, and digital tools.

Strengths

- All countries require an Energy Performance Certificate (EPC) for non-residential buildings upon sale, lease, or major renovation.
- Display obligations for EPCs in public buildings over 250 m² are enforced everywhere.
- Solar PV integration is either mandatory (Flanders, Italy, Spain) or encouraged (Portugal) for new or renovated buildings.

Mixed implementation

- Renovation obligations triggered by ownership transfer or lease are present in Flanders and Italy, but only voluntary or incentive-based in Spain and Portugal.
- Digital Building Logbooks and Smart Readiness Indicators are planned or piloted in all four countries, but not yet mandatory or fully implemented.
- Minimum energy performance standards (MEPS) are implicit or in development, but only Flanders currently enforces a functional MEPS through its EPC D level requirement.

Gaps

- Full implementation of the EPBD 2024 recast requirements—including MEPS, renovation passports, and harmonized digital tools—is still in progress or missing.
- The Smart Readiness Indicator (SRI)¹⁸, while piloted, is not operationalized in regulation.

¹⁸ **Article 8(10)–(12)** of Directive 2010/31/EU as amended by Directive (EU) 2018/844

- Coherence across regions (especially in Spain and Italy) remains a challenge due to decentralized implementation.

The implementation of the EPBD across the four countries has a direct impact on SMEs, many of which operate in older, poorly insulated non-residential buildings, rely on fossil fuels for heating and production processes, and maintain a non-EV fleet. On the one hand, the increasing regulatory obligations impose complex compliance requirements and substantial investment burdens; on the other hand, the absence of clear, stable, and enforceable frameworks fails to provide the certainty and incentive necessary for SME leadership to engage proactively in the energy transition.

Impact of ETS

The EU ETS is the EU's flagship policy for reducing greenhouse gas emissions and incentivizing decarbonization in key sectors. While the system has traditionally applied to large industrial emitters, recent reforms under the Fit for 55 package—particularly the introduction of ETS II—are expected to significantly expand its reach to SMEs.

Most SMEs are not directly regulated under the current EU ETS framework. The system primarily applies to large installations in carbon-intensive industries (e.g. energy, cement, steel, chemicals) with combustion capacity above 20 MW. Only a small number of SMEs—mainly in specialized manufacturing sectors—fall under this threshold and are required to monitor emissions and purchase allowances.

Some SMEs are increasingly affected indirectly by the EU ETS through various market mechanisms, including rising operational costs due to higher carbon prices, increased purchasing costs from suppliers in ETS-covered sectors, and growing pressure from large corporations to improve emissions transparency and reduce carbon footprints.

From 2027 onwards, the introduction of ETS II will significantly expand the scope of carbon pricing by covering fuel used in road transport and for heating of buildings. Although the system will formally apply to fuel suppliers, the resulting increased costs will be passed on to end users. Many sectors are likely to be due to diesel-powered machinery and vehicles or gas-based heating or production processes. Additionally, SMEs operating in older, poorly insulated buildings may face a disproportionate cost burden, further underlining the urgency of energy efficiency improvements and fuel switching.

INVENTORY OF THE EXISTING BARRIERS

Regulatory uncertainty and fragmentation

The EU defines with the REC and CEC two distinct types of energy communities. While both promote local energy initiatives and democratic control, they differ in scope and structure. RECs are limited to renewable energy sources and require geographical proximity between members and installations, with a strong focus on delivering environmental and social benefits. CECs have a broader scope, covering electricity in general (not just renewables), and do not impose geographic restrictions, but must remain under the effective control of citizens or local entities. For SMEs interested in sharing energy, these definitions can be limiting. While SMEs can participate in RECs or CECs, they cannot dominate or control them—governance must remain in the hands of citizens, local authorities, or smaller actors.

Member States are left to interpret and implement both definitions leading to fragmentation across the EU. Some countries merge the concepts into one legal entity; others keep them separate, adding layers of complexity. Flanders has opted to transpose both definitions separately, resulting in a clear framework for RECs but limited implementation of CECs, which creates confusion for stakeholders. Italy has taken a REC-focused approach, integrating the REC definition into national law while leaving CECs underdeveloped and without a distinct legal structure. In contrast, Spain and Portugal have chosen to merge the two concepts into a single, unified framework. Spain uses the broad category *comunidad energética*, which includes elements of both RECs and CECs, though implementation varies regionally. Portugal is considered a best-practice case, offering a clear and flexible legal structure that accommodates both renewable-specific and broader energy communities under the labels *Comunidade de Energia Renovável* and *Comunidade de Energia*.

Country	Transposition Approach	Legal Term Used	Practical Outcome
Flanders	Separate REC and CEC	Hernieuwbare energiegemeenschap Energiegemeenschap van Burgers	Confusion; REC used more often than CEC
Italy	REC-focused, CEC not distinct	Comunità energetica	One legal model based on REC; CEC underdeveloped
Spain	Merged definitions	Comunidad energética	Unified concept; variable implementation across regions
Portugal	Harmonised/merged framework	Comunidade de Energia Renovável / Comunidade de Energia	Clear, flexible framework; seen as best practice

Table 4 Existing regulatory framework in the Demo states

The EU has formally recognized the right to CSC as an alternative for EC. Jointly acting renewable self-consumers¹⁹ can consume, store, and sell locally produced renewable energy, provided they are in the

¹⁹ Directive (EU) 2023/2413 of the European Parliament and of the Council of 18 October 2023 amending Directive (EU) 2018/2001 on the promotion of the use of energy from renewable sources, **Article 21 – Renewable self-consumers**.

same building or geographical proximity. Complementing this, or active customers²⁰ are allowed to share self-generated electricity individually or collectively, particularly within shared buildings. These provisions aim to remove unjustified regulatory barriers and promote more democratic, decentralized energy systems across the EU, encouraging Member States to enable local energy sharing models without excessive administrative or technical burdens. The implementation of CSC varies significantly in the demo countries, depending on how they interpret geographic limits, grid usage, tariffs, and administrative procedures.

Aspect	Flanders (Belgium)	Italy	Portugal	Spain
Legal basis for CSC	Allowed under Energy Decree;	Permitted within buildings or shared roofs without formal REC/CEC; supported via GSE.	Allowed via Decree-Law 162/2019 and updated by Decree-Law No. 15/2022	Permitted under RD 244/2019;
Geographic scope	Same building.	Same building or same MV/LV transformer for informal CSC.	Up to 2 km (LV); broader ranges with DGEG approval.	≤500 m or 2 km (if rooftop/industrial); same LV transformer.
Grid use permitted	Yes, via public DSO grid; requires notification.	Yes, DSO measures shared energy within defined zone.	Yes, via public grid; shared energy allocation mandatory.	Yes, DSO manages allocation with predefined sharing keys.
Legal form required	No, for CSC within a building or one owner; REC required for multi-user setup across sites.	No, for CSC in shared buildings. REC required for broader sharing.	No, if CSC is via agreement; legal form required for REC.	No, contractual agreement between users suffices.
Tariff Incentives	None for CSC; standard charges apply.	Minimal incentives outside formal RECs.	Partial grid charge exemptions even for non-RECs.	No tariff incentives; standard fees apply.
Administrative Simplicity	Moderate; depends on DSO cooperation.	Moderate to high; dependent on DSO and GSE.	Moderate; new digital platform introduced in 2023.	High administrative burden; DSO delays common.

Table 5 Comparative overview of CSC outside RECs/CECs

The lack of harmonization, combined with varied interpretations of “geographical proximity,” grid access, and administrative rules, creates uncertainty for SMEs and hinders broader adoption of local energy sharing models. Clearer guidance and legal simplification could greatly enhance participation and impact.

The EU framework for energy communities, along with their national transpositions, and the CSC regulations offer significant opportunities for SMEs to develop new business models and collaborate with neighboring enterprises—particularly within business parks. Many SMEs are actively seeking solutions to reduce their dependence on volatile energy markets and are increasingly committed to achieving CO₂ neutrality.

Sustainability has become since the energy crisis a strategic priority. Rather than merely responding to regulations, many businesses are opting to reinvest their annual profits in climate-conscious measures.

²⁰ Directive (EU) 2019/944 of the European Parliament and of the Council of 5 June 2019 on common rules for the internal market for electricity, **Article 15 – Active customers**. Consolidated version published on **16 July 2024**

This growing willingness to act provides fertile ground for collective energy initiatives—if the frameworks are made more accessible and aligned with SMEs’ operational realities.

Current energy sharing frameworks are primarily designed for residential consumers and citizen energy communities. SMEs and business clusters, despite their potential to act as collective prosumers, often fall outside the scope of these policies.

While frameworks clearly allow for SME participation, many businesses struggle to navigate the complex landscape of legal and technical options. The available models often feel abstract or disconnected from their everyday operations. SMEs typically operate within business parks—settings where interaction is often limited. Contact with local authorities tends to be minimal, and engagement with neighboring citizens is rare. However, some business parks do have established associations that coordinate shared concerns such as security, mobility, or infrastructure. These associations could provide a strong organizational foundation for launching joint energy initiatives, making them ideal entry points for engaging SMEs in energy communities.

To fully unlock the potential of energy communities for SMEs, we need a clear and accessible framework that simplifies participation models and provides targeted support aligned with their specific organizational and spatial realities.

Structural limitations of local distribution grids

Local distribution grids across the EU are facing increasing pressure as energy systems decentralize and electrification accelerates. Despite efforts to modernize, several structural limitations remain that hinder the development of smart, flexible, and resilient local grids—especially in business parks.

Most business parks rely on low- and medium-voltage networks originally designed for one-way flows from the public grid to individual company meters.

The transformer stations and cabling often cannot accommodate multiple energy-producing entities and as more companies electrify heating, processes, and fleets, grid saturation becomes a common barrier to expansion.

Smart meters are more and more available, but sensors, and real-time data access are often missing. Without granular consumption and generation data, energy sharing, dynamic pricing, or flexibility services remain out of reach.

SMEs in business parks often face delays or unclear procedures when requesting new connections or capacity upgrades from DSOs. Regional DSO managers are available to discuss new sharing initiatives but face unclear rules and administrative barriers for changes.

Infrastructure within business parks may be owned or managed by multiple actors (DSO, park operator, private owners), complicating investment and upgrade decisions. This fragmentation makes it harder to implement collective self-consumption models or shared storage solutions.

Administrative and operational complexity

Despite growing interest among SMEs in joining or establishing local energy sharing arrangements, actual participation remains limited. Two major obstacles consistently surface across EU member states: administrative burden and the lack of standardized tools.

SMEs often face a maze of stakeholders—DSOs, regulators, municipalities, energy suppliers—with no one-stop-shop or coordinator to guide them through legal and technical steps.

Establishing a legal entity, setting up governance structures, drafting member agreements, and formalizing sharing arrangements often require external legal and technical advice. Standard legal templates for energy sharing arrangements are often lacking. Business parks with an established association have a clear advantage.

The absence of accessible digital platforms, legal templates, or billing systems tailored to SME energy sharing means that even willing participants often lack the means to proceed.

Tools for energy tracking, member management, real-time sharing visualization and billing or allocation systems are not yet available which means that even willing participants often lack the means to proceed.

Financial barriers

For SMEs, evolving toward carbon neutrality by 2050 requires significant investment across several fronts: improving energy efficiency in infrastructure, decarbonizing heating and production processes, installing renewable energy systems, and electrifying the vehicle fleet. These transitions are capital-intensive and often exceed the financial capacity of SMEs, particularly in the absence of tailored financing options. While public support mechanisms such as subsidies and tax incentives help reduce the burden, they are rarely sufficient to fully close the investment gap.

Moreover, access to bank loans remains a critical barrier. Many financial institutions perceive sustainability projects—especially those led by SMEs or energy communities—as high-risk or lacking clear business models. As a result, SMEs often face high interest rates or are denied financing altogether, underlining the urgent need for de-risking instruments and better-aligned financial support frameworks.

Many SMEs are unaware of available subsidies and financing instruments and often lack the internal expertise to develop strong business cases or navigate complex funding procedures.

In many cases, shared electricity is treated the same as standard grid consumption—subject to full taxes, levies, and network fees. Moreover, sometimes energy providers charge exorbitant administrative fees to every participant. This significantly erodes the economic advantage of energy sharing.

In an uncertain regulatory and market environment—where policies and tariffs for energy sharing or community ownership remain unclear or unstable—SMEs face significant challenges in developing reliable financial plans; the long-term nature of returns, combined with upfront consultancy costs required to set up an energy community, often discourages SMEs from initiating the process.

Awareness and coordination challenges

There is low visibility of such opportunities—many SMEs are simply unaware that energy sharing is a viable or permitted option, as the concept is rarely highlighted in mainstream advisory or energy efficiency programs; most information reaches them indirectly through sector federations or business associations, which occasionally disseminate relevant content via newsletters, workshops, or seminars.

SMEs often lack access to neutral third-party facilitators who can offer the technical and organizational support needed to coordinate joint energy initiatives, evaluate their feasibility, and ensure compliance with complex regulatory frameworks. Most existing facilitators focus primarily on energy sharing with citizens or specific target groups, leaving SMEs underserved and without tailored guidance for business-focused collaboration.

Trust and cooperation are also essential, particularly in business parks where individual SMEs typically operate independently without a central coordinating entity; effective energy sharing relies on strong local relationships and governance structures, which do not develop organically without targeted facilitation.

The presence of an established business park association, especially when actively supported by the local authority, serves as a trust multiplier that can significantly enhance collaboration and facilitate the setup of energy sharing initiatives among SMEs.

Lastly, energy communities in business parks hold untapped potential for social inclusion—by collaborating with local authorities, SMEs can engage non-profits, schools, and social enterprises, strengthening both the community impact and the legitimacy of the initiative.

Appendix: national frameworks

Flanders

The Flemish regulatory framework for energy sharing is based on:

- The Energiebesluit van 19 november 2010, as amended (Flemish Energy Decree);
- The Vlaamse Codex Energie, available via codex.vlaanderen.be;
- Implementation guidelines and registration procedures provided by the distribution system operator Fluvius, through the platform myfluvius.be;
- Regulatory oversight and recognition of Renewable and Citizen Energy Communities managed by the VREG (Vlaamse Regulator van de Elektriciteits- en Gasmarkt).

Italy

The Italian regulatory framework for energy sharing is based on:

- Legislative Decree No. 199 of 8 November 2021 (implementation of Directive (EU) 2018/2001 on renewable energy),
- ARERA Resolution 727/2022 (TIAD – Technical Rules for Access to Energy Sharing),
- CACER Decree 414/2023 (criteria for the allocation of incentives),
- ARERA Resolution 15/2024,
- GSE Operative Rules issued on 23 February 2024.

Spain

The Spanish regulatory framework for energy sharing is based on:

- Royal Decree 244/2019 of 5 April 2019, regulating the administrative, technical and economic conditions of self-consumption;
- Royal Decree-law 23/2020 and subsequent updates aligning with Directive (EU) 2018/2001;
- Royal Decree-law 22/2022, introducing comprehensive set of urgent measures;
- The Order TED/1247/2020, detailing criteria for proximity in collective self-consumption;
- Amendments made in 2024 and 2025 in preparation for full implementation of the revised EU Electricity Market Design (EMD);

Portugal

The Portuguese regulatory framework for energy sharing is based on:

- Decree-Law No. 162/2019, establishing the legal basis for individual and collective self-consumption and Renewable Energy Communities (RECs), partially transposing Directive (EU) 2018/2001;
- Decree-Law No. 15/2022, which consolidated and updated national energy legislation in line with both Directive (EU) 2018/2001 and Directive (EU) 2019/944;
- Decree-Law No. 99/2024, introducing further amendments to improve regulatory clarity and flexibility for RECs;
- Implementation and oversight provided by the Direção-Geral de Energia e Geologia (DGEG) and national DSOs, particularly in defining grid access and proximity criteria.



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