



Handbook on Cross-border Energy Communities

Annex 1 – Border Fiches

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Handbook on Cross-border Energy Communities

Annex 1 – Border Fiches

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Abbreviations

CBEC	Cross-Border Energy Community
CEC	Citizen Energy Community
CEF	Connecting Europe Facility
CEP	“Clean Energy for all Europeans” Package
DSO	Distribution System Operator
EC	European Commission
EGTC	European Grouping of Territorial Cooperation
ENTSO-E	European Network of Transmission System Operators for Electricity
ERDF	European Regional Development Fund
EU	European Union
EUR	Euro
IMED	Internal Market for Electricity Directive (EU) 2019/944
kV	Kilovolt
MS	Member State
Q-CBEC	Quasi-Cross-Border Energy Community
REC	Renewable Energy Community
RES	Renewable Energy Sources
RED II	Revised Renewable Energy Directive (EU) 2018/2001
RRP	Recovery and Resilience Plans
TSO	Transmission System Operator

Austria-Czech Republic

Categories	Indicators	Description
Cross-border Energy Communities	Legal framework for cross-border energy communities	There is currently a notable absence of specific legislative frameworks to establish Cross-Border Energy Communities (CBEs) between Austria and Czech Republic. Austria's Renewable Energy Expansion Act package (2021) restricts energy community participation to entities within the Austrian borders. Czech Republic's 2024 amendments to its Energy Act do not address provisions for Citizen Energy Communities (CECs) and Renewable Energy Communities (RECs) to be open to cross-border participation. This lack of transposition creates a significant barrier to establishing formal CBEs between the two countries.
	Private/Public financing instruments	Despite this legislative gap, the Interreg Austria-Czech 2021-2027 Programme stands out as a potential facilitator for cross-border cooperation for cooperation on energy. Although not explicitly focusing on energy communities, the Interreg Programme provides an opportunity to indirectly support energy-related cooperation, e.g. through improving coordination of local and regional energy planning and identifying and solving administrative and legal obstacles in the cross-border context. It can fund activities such as strategic planning, feasibility studies, stakeholder engagement, and knowledge and information exchange, paving the way for renewable energy cooperation between the two Member States. For CBEs, the Programme can play a significant role in enabling networks, clusters and partnerships between Austrian and Czech municipalities, private entities, and local communities. Additionally, it offers a platform to test innovative models for cross-border energy sharing and governance through pilot projects. For instance, renewable energy projects close to the border might involve shared infrastructure for wind or solar power, supported by Interreg funding and administrative resources.
	Partnerships available	In addition, Interreg B programmes such as the Interreg Central Europe Programme 2021-2027 (with its 2021-2027 project HERCULES-CE to enhance the energy transition in Central Europe with the support of renewable energy communities) or the Interreg Danube Programme 2021-2027 (with the 2021-2027 projects NRGCOM and DECA

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		dedicated to accelerate RECs and CECs and create appropriate operational conditions for energy communities in the Danube region), as well as Interreg Europe (for example, the 2021-2027 project REC4EU – Renewable Energy Communities for EU regions) can also be used to positively influence framework conditions for cross-border energy initiatives. Moreover, in the 2021–2027 period, the Connecting Europe Facility (CEF) Energy programme introduced a new category of projects: cross-border projects in the field of renewable energy. This addition is designed to enhance cross-border collaboration, recognizing the importance of regional cooperation in accelerating the deployment of renewable energy. CEF Energy complements other EU funding Programmes for renewables by specifically targeting initiatives that bridge national efforts, creating synergies that optimize resource use and infrastructure.
Energy Communities	Transposition for energy communities	Austria's approach to energy communities provides a solid framework but lacks emphasis on governance and autonomy, presenting key shortcomings. It includes comprehensive rights, obligations, and enabling measures for energy sharing but needs improvement in governance and inclusivity. The Austrian Coordination Office for Energy Communities supports ECs with incentives like grid fee reductions and feed-in premiums of up to 50%. A transition to tendering procedures, starting with wind power projects, is underway, backed by EUR 4 million in funding for RECs and CECs. However, challenges such as legislative expertise, seed capital, and logistical issues hinder the formation of energy communities, especially for CECs requiring a shared network operator amidst over 120 operators.
	Financial support measures	In January 2024, the Czech Republic enacted laws defining and regulating CECs and RECs, aligning with EU principles. Although financing measures for energy communities are included in the national Recovery and Resilience Plan and the Modernisation Fund, there are no dedicated measures for energy communities within the national renewable support scheme.

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Categories	Indicators	Description
General and Electricity Network	Organisation of the national electricity network	Interconnection levels of the national electricity networks are regular. The national power grids of Austria and the Czech Republic are organized to ensure stability and efficiency in power transmission and distribution. Overall, interconnection exists, but capacity constraints limit large and medium scales exchanges. Both countries have integrated transmission systems to facilitate the safe and adequate cross-border flow of electricity. Austrian Power Grid (APG) and ČEPS manage these networks, ensuring stable transmission and integration with the European grid. Harmonization of grid operations and regulatory practices aligns with EU and ENTSO-E regulations, enabling strong grid interconnections, market integration, and regulatory harmonization to support cross-border energy communities.
	Electricity transfer and heat transfer	The transfer of electricity between Austria and the Czech Republic is facilitated by interconnected networks that enable electricity exchange according to European market rules. This interconnection balances supply and demand, contributing to energy security and the integration of renewable energy sources. Austria and the Czech Republic share several key 220 kV and 400 kV transmission lines, including the Südburgenland -Brno and Kromeriz-Stein interconnections. These interconnections are vital for facilitating electricity exchange and maintaining the stability of the power grid in both countries.
	Congestion Management	The cross-border interconnections allow for the efficient transfer of electricity during peak demand times, as well as the sharing of renewable energy resources, such as Austria's hydropower and the Czech Republic's expanding solar and wind capacity. However, the countries do not have an interconnected network for heat exchange. Congestion management is a key challenge, particularly with increasing renewable energy generation, requiring solutions such as Dynamic Line Rating, energy storage, and demand response to stabilize power flows. Smart grids and digitalization will play a crucial role in enabling seamless cross-border energy sharing, optimizing grid performance, and preventing overloads. Austria and the Czech Republic actively collaborate on congestion management to ensure the reliability and stability of their interconnected power grids and the entire European electricity grid. They use

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		coordinated measures, such as market mechanisms and real-time grid management and dispatching tools, to manage grid imbalances according to EU guidelines, promoting efficient cross-border electricity trade and grid security. Additionally, aligning tariffs, grid fees, and regulations will ensure fair access for decentralized energy producers. Leveraging EU funding programs and coordinating through ENTSO-E will be essential to strengthening cross-border electricity exchange and supporting a resilient and efficient energy network.

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Austria-Germany

Categories	Indicators	Description
Cross-border Energy Communities	Legal framework for cross-border energy communities	Cross-border energy communities (CBEs) between Austria and Germany face challenges due to the absence of explicit cross-border provisions in both countries' energy policies. Austria's Renewable Energy Expansion Act package 2021 and Germany's Renewable Energy Act 2023 both impose residency requirements that effectively exclude participation from the neighbouring country. Austria ties participation to registration in specific concession areas or connection to Austrian-only distribution networks, while Germany links membership to registration in its national registry, accessible only to German residents. These restrictions prevent a priori cross-border energy sharing and consumption of community-produced energy. Germany additionally lacks a legal framework for energy sharing and faces challenges with grid connections in multi-unit buildings. The absence of clear guidelines, particularly for energy sharing in Germany, further complicates the establishment of CBEs.
	Private/Public financing instruments	Despite these obstacles, potential for cross-border cooperation on energy exists in particular through the Interreg Germany/Bavaria – Austria Programme 2021-2027, which supports 'cross-border energy cooperation specifically under its Priorities for integrated regional development, and cross-border governance. These Priority axes target the most pressing regional challenges while fostering innovation and sustainable practices. Regarding CBEs, the Interreg VI-A Bavaria-Austria Programme can fund actions to create a favourable framework for fostering energy cooperation across borders especially at the level of the cross-border Euregio areas. The Programme can support initiatives such as renewable energy projects, energy-sharing mechanisms, and cross-border knowledge platform development. In addition, Interreg B programmes such as the Interreg Central Europe Programme 2021-2027 (with its 2021-2027 project HERCULES-CE to enhance the energy transition in Central Europe with the support of renewable energy communities) or the Interreg Danube Programme 2021-2027 (with the 2021-2027 projects NRGCOM and DECA dedicated to accelerate RECs and CECs and

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Categories	Indicators	Description
		create appropriate operational conditions for energy communities in the Danube region), as well as Interreg Europe (for example, the 2021-2027 project REC4EU – Renewable Energy Communities for EU regions) can also be used to positively influence framework conditions for cross-border energy initiatives. Moreover, in the 2021–2027 period, the Connecting Europe Facility (CEF) Energy programme introduced a new category of projects: cross-border projects in the field of renewable energy. This addition is designed to enhance cross-border collaboration, recognizing the importance of regional cooperation in accelerating the deployment of renewable energy. The CEF Energy complements other EU funding Programmes for renewables by specifically targeting initiatives that bridge national efforts, creating synergies that optimize resource use and infrastructure.
	Partnerships available	There are several cooperation networks and partnerships at the German-Austrian border, that can offer a starting point for a cross-border energy cooperation. Several Euregios such as the Euregio Bayerischer Wald - Böhmerwald - Unterer Inn, the Inn-Salzach-Euregio, the EUREGIO Salzburg - Berchtesgadener Land – Traunstein, the Euregio via salina or the Euregio Zugspitze/Wetterstein-Karwendel present local cooperation frameworks. Even if energy cooperation is usually not among their priorities, they offer a favourable space for new initiatives such as CBEC or Q-CBEC. In fact, several initiatives for cross-border energy cooperation are on their way, such as the cross-border heating network promoted by Regionalwerk Chiemgau-Rupertiwinkel. The Interreg programme also supports projects with a focus on energy. One example is the 2021-2027 Interreg project 'RING', with a territorial focus on the border region between Bavaria and Upper Austria, where numerous companies are involved in the fields of electrical energy supply and energy storage. The project focuses on the establishment of a cross-border knowledge network, the development of a cross-border knowledge platform 'Direct current high-voltage technology in the energy sector' and the development of the electrical insulation technology, as the basis for new products in high-voltage direct current storage technology.

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Categories	Indicators	Description
Energy Communities	Transposition for energy communities and support measures	Austria's approach to energy communities (ECs) provides a solid framework but lacks emphasis on governance and autonomy, presenting key shortcomings. It includes comprehensive rights, obligations, and enabling measures for energy sharing but needs improvement in governance and inclusivity. The Austrian Coordination Office for Energy Communities supports ECs with incentives like grid fee reductions and feed-in premiums of up to 50%. A transition to tendering procedures, starting with wind power projects, is underway, backed by EUR 4 million in funding for RECs and CECs. However, challenges such as legislative expertise, seed capital, and logistical issues hinder the formation of energy communities, especially for CECs requiring a shared network operator amidst over 120 operators. Germany has integrated the REC concept into its existing framework by amending the definition of "citizen energy company" under the Renewable Energy Act 2022, with support managed by the National Energy Regulator. Recent improvements to the renewables support scheme address past shortcomings but still lack a comprehensive enabling and regulatory framework to facilitate energy sharing among RECs. In German law, there is no direct equivalent to the concept of a 'citizen energy community' as defined in the Internal Electricity Market Directive.
General and Electricity Network	Organisation of the national electricity network	Overall, interconnection levels of the national electricity networks are very good. The national power grids of Austria and Germany are organized to ensure stability and efficiency in power transmission and distribution. Long-standing energy cooperation with Austria plays a crucial role in balancing the German power grid, and vice versa. Strong interconnections support renewable energy distribution across borders. Managed by Austrian Power Grid (APG) in Austria and by several transmission system operators in Germany—including TenneT, Amprion, 50Hertz, and TransnetBW—these networks facilitate safe and efficient cross-border electricity flows in

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	Electricity transfer and heat transfer	accordance with European market rules. Harmonization of grid operations and regulatory practices under EU and ENTSO-E guidelines supports strong interconnections, market integration, and regulatory harmonization, which are essential for cross-border energy communities. Austria and Germany share several key 400 kV and 220 kV transmission lines, such as the Linz-Munich and Salzburg-Ingolstadt interconnections, which enable the efficient and secure exchange of electricity between the two countries. These robust interconnections are essential for maintaining grid stability and optimizing electricity flows. Key infrastructure projects such as the SuedOstLink and Austrian-German HVDC interconnections support enhanced cross-border capacity and contribute to the development of an integrated European electricity grid. The interconnected networks balance supply and demand, contributing to energy security and the integration of renewable energy sources, although there is no integrated network for heat exchange.
	Congestion Management	Given the challenge of managing congestion amid increasing renewable generation, innovative solutions such as Dynamic Line Rating (DLR), energy storage, and demand response are crucial to stabilizing power flows. Additionally, smart grids and digitalization enable seamless cross-border energy sharing, optimizing grid performance and preventing overloads. Active collaboration between Austria and Germany—through coordinated market mechanisms and real-time grid management tools—further promotes efficient electricity trade and grid reliability. Aligning tariffs, grid fees, and regulations to ensure fair access for decentralized energy producers, alongside leveraging EU funding programmes and coordinating through ENTSO-E, remains key to strengthening cross-border electricity exchange and supporting a resilient, efficient energy network.

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Austria-Hungary

Categories	Indicators	Description
Cross-border Energy Communities	Legal framework for cross-border energy communities	Cross-border energy communities (CBEs) between Austria and Hungary face significant legal barriers due to the lack of supportive legislation in both countries. Austria's Renewable Energy Expansion Act package 2021 restricts energy community participation to entities registered within Austrian concession areas or connected to Austrian distribution networks. Hungary's Electricity Act LXXXVI explicitly prohibits energy communities from engaging in cross-border activities. Despite these obstacles, the cross-border Interreg Programme between the two countries offers a favourable framework to start cooperation on energy in the cross-border area. The Interreg Austria-Hungary Programme 2021-2027 supports cooperation activities across the border regions of Austria and Hungary, which can also include the preparation of cross-border energy cooperation. In particular under its Specific Objective 4.1 the Programme can support the elaboration of monitoring and data exchange systems to improve cross-border know-how exchange and decision making, the development of strategic frameworks among public organisations in the energy field, the implementation of joint solutions to improve cross-border governance and reduce cross-border obstacles and the development of skills as well as awareness raising aiming at a better cross-border cooperation. In addition, Interreg B programmes such as the Interreg Central Europe Programme 2021-2027 (with its 2021-2027 project HERCULES-CE to enhance the energy transition in Central Europe with the support of renewable energy communities) or the Interreg Danube Programme 2021-2027 (with the 2021-2027 projects NRGCOM and DECA dedicated to accelerate RECs and CECs and create appropriate operational conditions for energy communities in the Danube region), as well as Interreg Europe (for example, the 2021-2027 project REC4EU – Renewable Energy Communities for EU regions) can also be used to positively influence framework conditions for cross-border energy initiatives. Moreover, in the 2021–2027 period, the Connecting Europe Facility (CEF) Energy programme
	Private/Public financing instruments	

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Categories	Indicators	Description
	Partnerships available	introduced a new category of projects: cross-border projects in the field of renewable energy. This addition is designed to enhance cross-border collaboration, recognizing the importance of regional cooperation in accelerating the deployment of renewable energy. The CEF Energy complements other EU funding Programmes for renewables by specifically targeting initiatives that bridge national efforts, creating synergies that optimize resource use and infrastructure. An example of cross-border cooperation on energy communities in this cross-border area is one pilot action within the Horizon 2020-funded SHAREs project, involving Heiligenbrunn, Austria, and Körmend, Hungary, which demonstrates an innovative approach to overcoming cross-border energy community challenges. The pilot action within the SHAREs project supports the expansion of the energy community to include cross-border activities with the nearby Hungarian municipality of Körmend. Despite Hungary's stricter regulations, this initiative showcases the potential for expanding cross-border energy activities and highlights the opportunities for cooperation between the two countries. With further adaptation to regulatory frameworks, such efforts could become a model for broader cross-border energy community development.
Energy Communities	Transposition for energy communities and support measures	Austria's approach to energy communities (ECs) provides a solid framework but lacks emphasis on governance and autonomy, presenting key shortcomings. It includes comprehensive rights, obligations, and enabling measures for energy sharing but needs improvement in governance and inclusivity. The Austrian Coordination Office for Energy Communities supports ECs with incentives like grid fee reductions and feed-in premiums of up to 50%. A transition to tendering procedures, starting with wind power projects, is underway, backed by EUR 4 million in funding for RECs and CECs.

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		However, challenges such as legislative expertise, seed capital, and logistical issues hinder the formation of energy communities, especially for CECs requiring a shared network operator amidst over 120 operators. Hungary, on the other hand, has struggled to combine both definitions into a coherent concept, currently REC defined as subset of CECs. Some criteria proposed by the EU Directives are still missing in national legislation, and, in more detail, the full transposition of the REDII Directive has not been achieved, notably excluding heating and cooling as eligible activities for RECs. So far, in Hungary, support schemes tend to prioritize for-profit companies, which may limit community involvement.
General and Electricity Network	Organisation of the national electricity network	The national power grids of Austria and Hungary are organized to ensure stability and efficiency in power transmission and distribution. Overall, there is a moderate level of integration with potential for increased cross-border collaboration. Managed by Austrian Power Grid (APG) in Austria and MAVIR Zrt. in Hungary, these interconnected systems operate in accordance with EU and ENTSO-E regulations, facilitating safe and efficient cross-border electricity flows under European market rules. This integration supports the balancing of supply and demand and the incorporation of renewable energy sources while addressing challenges such as congestion management amid increasing renewable generation. The 400 kV transmission lines between Austria and Hungary, including the Klingenbach-Szentgotthárd and Kommendorf-Pötschach links, facilitate electricity exchange between the two countries. These interconnections allow for the safe and efficient flow of electricity, enhancing grid stability and supporting the integration of renewable energy across borders.
	Electricity transfer and heat transfer	Planned and ongoing projects, such as the Austrian-Hungarian interconnection upgrade, aim to further increase the capacity and flexibility of these connections. To stabilize power flows, both countries rely on innovative measures including Dynamic Line Rating (DLR), energy storage, and
	Congestion Management	

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		demand response. Furthermore, advancements in smart grids and digitalization enable real-time grid management and optimize energy sharing, ensuring that tariffs, grid fees, and regulatory practices are harmonized for fair access to decentralized energy production. Leveraging EU funding programmes and coordinated market mechanisms remains key to strengthening cross-border electricity exchange and supporting a resilient, efficient energy network between Austria and Hungary.

Austria-Italy

Categories	Indicators	Description
Cross-border Energy Communities	Legal framework for cross-border energy communities	CBECs between Italy and Austria face significant legal challenges due to the absence of supportive legislation in both countries. Austria's Renewable Energy Expansion Act package 2021 restricts energy community participation to entities registered within Austrian concession areas or connected to Austrian distribution networks. Similarly, Italy's January 2024 Decree does not address or support provisions for RECs and CECs to be open to cross-border participation.
	Private/Public financing instruments	Despite these regulatory gaps, the Interreg A Italy-Austria Programme 2021-2027 offers a potential framework for collaboration. The Interreg A Italy-Austria Programme supports the development of cross-border projects, among others on energy, in particular through the support to local development projects that involve local communities through a participatory approach in order to address social, economic and environmental challenges, as well as the support to find governance solutions to overcome cross-border obstacles to cooperation, especially of a legal and administrative nature. In addition, Interreg B programmes such as the Interreg Central Europe Programme 2021-2027 (with its 2021-2027 project HERCULES-CE to enhance the energy transition in Central Europe with the support of renewable energy communities) or the Interreg Danube Programme 2021-2027 (with the 2021-2027 projects NRGCOM and DECA dedicated to accelerate RECs and CECs and create appropriate operational conditions for energy communities in the Danube region), as well as Interreg Europe (for example, the 2021-2027 project REC4EU – Renewable Energy Communities for EU regions) can also be used to positively influence framework conditions for cross-border energy initiatives. Moreover, in the 2021–2027 period, the Connecting Europe Facility (CEF) Energy programme introduced a new category of projects: cross-border projects in the field of renewable energy. This addition is designed to enhance cross-border collaboration, recognizing the importance of regional cooperation in accelerating the

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Categories	Indicators	Description
	Partnerships available	deployment of renewable energy. The CEF Energy complements other EU funding Programmes for renewables by specifically targeting initiatives that bridge national efforts, creating synergies that optimize resource use and infrastructure. One notable project example exists in the district heating sector, the cross-border district heating system in the Pramollo-Nassfeld area, highlights the exciting potential of cross-border energy cooperation, despite some challenges. The initiative aims to link Austria and Italy through a shared district heating system, underscoring the opportunity to create integrated energy solutions across borders. While differing systems of energy pricing, taxation, and public services between the two countries require careful regulation, these differences also open the door for innovative solutions and harmonized approaches. The existence of different regulatory structures, with Italy having a national regulatory authority for district heating and Austria lacking one, presents an opportunity for collaboration and mutual learning between both countries. Although this creates complexities in price monitoring and taxes, it also fosters the potential to align and streamline regulations for more efficient cross-border energy exchanges.

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Categories	Indicators	Description
Energy Communities	Transposition for energy communities and support measures	Austria's approach to energy communities (ECs) provides a solid framework but lacks emphasis on governance and autonomy, presenting key shortcomings. It includes comprehensive rights, obligations, and enabling measures for energy sharing but needs improvement in governance and inclusivity. The Austrian Coordination Office for Energy Communities supports ECs with incentives like grid fee reductions and feed-in premiums of up to 50%. A transition to tendering procedures, starting with wind power projects, is underway, backed by EUR 4 million in funding for RECs and CECs. However, challenges such as legislative expertise, seed capital, and logistical issues hinder the formation of energy communities, especially for CECs requiring a shared network operator amidst over 120 operators. Italy has also made strides in implementing EU directives, introducing definitions for Renewable Energy Communities (RECs) and Citizen Energy Communities (CECs). While support schemes for RECs are in place, such as the National Recovery and Resilience Plan and a premium tariff for real-time self-consumption, no similar schemes exist for CECs.
	Organisation of the national electricity network	The national power grids of Austria and Italy are organized to ensure stability and efficiency in power transmission and distribution. Overall, they support cross-border trade, but network constraints limit full integration. Managed by Austrian Power Grid (APG) in Austria and Terna in Italy, these systems operate in accordance with EU and ENTSO-E regulations to facilitate safe and efficient cross-border electricity flows under European market rules. Their interconnected networks support the balancing of supply and demand and the integration of renewable energy sources, even though there is no coordinated network for heat exchange. The 400 kV transmission lines connecting Austria and Italy, especially the Tyrol-South Tyrol link and the Südtirol-Austria interconnection, enable efficient electricity flow between the two countries. These interconnections are crucial for maintaining grid stability and ensuring a reliable power transfer while adhering to European market rules. New interconnection projects such as the "Austrian-Italian Transmission Line" (AIST), are being
General and Electricity Network	Electricity transfer and heat transfer	
	Congestion Management	

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Categories	Indicators	Description
		developed to further enhance the capacity and flexibility of the electricity exchange. As renewable generation increases, both countries address congestion management challenges through innovative solutions such as Dynamic Line Rating (DLR), energy storage, and demand response. The use of smart grids and digitalization enables real-time grid management and optimized energy sharing, while harmonized tariffs, grid fees, and regulatory practices ensure fair access to decentralized energy production. Leveraging EU funding programmes and coordinated market mechanisms remains crucial to strengthening cross-border electricity exchange and supporting a resilient, efficient energy network between Austria and Italy

Austria -Slovakia

Categories	Indicators	Description
Cross-border Energy Communities	Legal framework for cross-border energy communities	CBECs between Austria and Slovakia face significant regulatory obstacles due to the lack of supportive legislation in both countries. Austria's Renewable Energy Expansion Act package 2021 restricts energy community participation to entities registered within Austrian concession areas or connected to Austrian distribution networks, effectively preventing cross-border participation for energy communities. Similarly, Slovakia's legal framework, including Act 256/2022 amending Act 251/2012 on Energy and the subsequent amendment 363/2022 to Act 309/2009 on Support for Renewable Energy Sources, does not address or provide provisions for RECs and CECs to be open to cross-border participation. This legislative situation in both countries poses a substantial barrier to establishing formal cross-border energy communities.
	Private/Public financing instruments	Despite these challenges, the Interreg A Slovakia-Austria Programme 2021-2027 offers a potential avenue for reducing legal and administrative obstacles and fund pilot actions or preparatory studies for cross-border cooperation in the energy sector. While not specifically focusing on CBECs, this cooperation Programme could potentially be used to support energy-related initiatives spanning the Austrian-Slovak border. It supports the development of cross-border energy communities through strengthening cross-border governance and institutional cooperation. The absence of explicit CBEC provisions in both countries' energy policies underscores the need for targeted legislative action to facilitate cross-border energy cooperation and community development between Austria and Slovakia.
		In addition, Interreg B programmes such as the Interreg Central Europe Programme 2021-2027 (with its 2021-2027 project HERCULES-CE to enhance the energy transition in Central Europe with the support of renewable energy communities) or the Interreg Danube Programme 2021-2027 (with the 2021-2027 projects NRGCOM and DECA dedicated to accelerate RECs and CECs and create appropriate operational conditions for energy communities in the Danube region), as well

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Categories	Indicators	Description
	Partnerships available	as Interreg Europe (for example, the 2021-2027 project REC4EU – Renewable Energy Communities for EU regions) can also be used to positively influence framework conditions for cross-border energy initiatives. Moreover, in the 2021–2027 period, the Connecting Europe Facility (CEF) Energy programme introduced a new category of projects: cross-border projects in the field of renewable energy. This addition is designed to enhance cross-border collaboration, recognizing the importance of regional cooperation in accelerating the deployment of renewable energy. The CEF Energy complements other EU funding Programmes for renewables by specifically targeting initiatives that bridge national efforts, creating synergies that optimize resource use and infrastructure. Local cooperation frameworks such as urban cross-border associations or the Euregio Silva Nortica and the Euregio Pomoraví Weinviertel offer a good starting point for new cooperation projects, even if energy is so far not among the key priorities of local cross-border cooperation.
Energy Communities	Transposition for energy communities and support measures	Austria's approach to energy communities (ECs) provides a solid framework but lacks emphasis on governance and autonomy, presenting key shortcomings. It includes comprehensive rights, obligations, and enabling measures for energy sharing but needs improvement in governance and inclusivity. The Austrian Coordination Office for Energy Communities supports ECs with incentives like grid fee reductions and feed-in premiums of up to 50%. A transition to tendering procedures, starting with wind power projects, is underway, backed by EUR 4 million in funding for RECs and CECs. However, challenges such as legislative expertise, seed capital, and logistical issues hinder the formation of energy communities, especially for CECs requiring a shared network operator amidst over 120 operators. In contrast, Slovakia, on the other hand, is still in the early stages, with two definitions of RECs and CECs that reflect largely the definition provided in the relevant EU Directives. The Program Slovensko was designed as a key national policy instrument and initiative to channel financial and technical support towards the development of energy communities. This program is seen as a vital tool in overcoming current barriers to the growth of ECs in

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Categories	Indicators	Description
		Slovakia. However, there are still several obstacles such as insufficient legal support, the need for an effective billing system, and the lack of economic analysis of the benefits of ECs.
General and Electricity Network	Organisation of the national electricity network	The national power grids of Austria and Slovakia are organized to ensure stability and efficiency in power transmission and distribution. Grid connection is functional, but congestion issues remain. Managed by Austrian Power Grid (APG) in Austria and SEPS, a.s. in Slovakia, these interconnected systems operate in accordance with EU and ENTSO-E regulations. Their robust interconnections support the balancing of supply and demand and the integration of renewable energy sources, even though there is no coordinated network for heat exchange. The 400 kV transmission lines connecting Austria and Slovakia, particularly through the Gabčíkovo substation (Slovakia) and the Völkermarkt substation (Austria), enable efficient electricity flow between the two countries. These interconnections are vital for maintaining grid stability and ensuring adequate electricity transfer in line with European market regulations. As renewable energy generation increases, both countries address congestion management challenges through innovative solutions such as Dynamic Line Rating (DLR), energy storage, and demand response. Advanced smart grids and digitalization enable real-time grid management and optimized energy sharing, while harmonized tariffs, grid fees, and regulatory practices ensure fair access for decentralized energy production. Leveraging EU funding programmes and coordinated market mechanisms remains crucial to strengthening cross-border electricity exchange and supporting a resilient, efficient energy network between Austria and Slovakia.
	Electricity transfer and heat transfer	
	Congestion Management	

Austria-Slovenia

Categories	Indicators	Description
Cross-border Energy Communities	Legal framework for cross-border energy communities	CBECs between Austria and Slovenia face significant regulatory challenges due to the absence of supportive legislation in both countries. Austria's Renewable Energy Expansion Act package 2021 restricts energy community participation to entities registered within Austrian concession areas or connected to Austrian distribution networks, effectively preventing cross-border participation. Similarly, Slovenia's legal framework, including the Act on the promotion of renewable energy sources (ZSROVE), the Act on Electricity Supply (ZOEE), and Decree n. 4211 for electricity market operation, does not address or provide provisions for RECs and CECs to be open to cross-border participation. This legislative gap in both countries poses a substantial barrier to establishing formal cross-border energy communities. In general, the Interreg VI-A Slovenia-Austria Programme 2021-2027 offers a potential avenue for cross-border energy cooperation, which could potentially support energy-related initiatives along the Austrian-Slovenian border. Cross-border co-operation could create added value in addressing the following need: jointly tackling numerous challenges and overcoming obstacles due to different administrative and legal systems and jurisdictions through support for the development of the cross-border co-operation. In addition, Interreg B programmes such as the Interreg Central Europe Programme 2021-2027 (with its 2021-2027 project HERCULES-CE to enhance the energy transition in Central Europe with the support of renewable energy communities) or the Interreg Danube Programme 2021-2027 (with the 2021-2027 projects NRGCOM and DECA dedicated to accelerate RECs and CECs and create appropriate operational conditions for energy communities in the Danube region), as well as Interreg Europe (for example, the 2021-2027 project REC4EU – Renewable Energy Communities for EU regions) can also be used to positively influence framework conditions for cross-border energy initiatives. Moreover, in the 2021–2027 period, the Connecting Europe Facility (CEF) Energy programme introduced a new category of projects: cross-border projects in the field of
	Private/Public financing instruments	

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Categories	Indicators	Description
	Partnerships available	renewable energy. This addition is designed to enhance cross-border collaboration, recognizing the importance of regional cooperation in accelerating the deployment of renewable energy. The CEF Energy complements other EU funding Programmes for renewables by specifically targeting initiatives that bridge national efforts, creating synergies that optimize resource use and infrastructure. Cross-border cooperation in the energy sector is exemplified by the Green Switch project (funded by CEF-Energy), which involves transmission and distribution systems and network operators from Austria, Croatia, and Slovenia. While not specifically focused on CBECs, this project aims to optimize grid investment, increase hosting capacity for renewable sources, improve supply quality, and efficiently integrate new loads across borders.
Energy Communities	Transposition for energy communities and support measures	Austria's approach to energy communities (ECs) provides a solid framework but lacks emphasis on governance and autonomy, presenting key shortcomings. It includes comprehensive rights, obligations, and enabling measures for energy sharing but needs improvement in governance and inclusivity. The Austrian Coordination Office for Energy Communities supports ECs with incentives like grid fee reductions and feed-in premiums of up to 50%. A transition to tendering procedures, starting with wind power projects, is underway, backed by EUR 4 million in funding for RECs and CECs. However, challenges such as legislative expertise, seed capital, and logistical issues hinder the formation of energy communities, especially for CECs requiring a shared network operator amidst over 120 operators. Slovenia has made some progress by transposing the related EU directives and planning enabling measures, but it largely follows the EU Directives without concrete measures yet in place.
General and Electricity Network	Organisation of the national electricity network	The national power grids of Austria and Slovenia are organized to ensure stability and efficiency in power transmission and distribution. Overall, interconnection allows energy exchanges, but constraints exist. Managed by Austrian Power Grid (APG) in Austria and ELES in Slovenia, these

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Categories	Indicators	Description
	Electricity transfer and heat transfer	interconnected systems operate in accordance with EU and ENTSO-E regulations to facilitate safe and efficient cross-border electricity flows under European market rules. Their robust interconnections support the balancing of supply and demand and the integration of renewable energy sources, even though there is no coordinated network for heat exchange. Moreover, the 400 kV transmission lines between Austria and Slovenia, such as the Maribor-Obersielach line, enable safe and efficient cross-border electricity flows. These interconnections are aligned with EU regulations, contributing to a more integrated electricity market. As renewable generation increases, both countries address congestion management challenges through innovative solutions such as Dynamic Line Rating (DLR), energy storage, and demand response. Advanced smart grids and digitalization enable real-time grid management and optimized energy sharing, while harmonized tariffs, grid fees, and regulatory practices ensure fair access for decentralized energy production. Leveraging EU funding programs and coordinated market mechanisms remains crucial to strengthening cross-border electricity exchange and supporting a resilient, efficient energy network between Austria and Slovenia.
	Congestion Management	

Belgium-France

Categories	Indicators	Description
Cross-border Energy Communities	Legal framework for cross-border energy communities	CBECs between Belgium and France face some regulatory challenges. In Belgium, federal law and regional decrees (Brussels, Flanders, Wallonia) do not explicitly address CBECs and do not include provisions for RECs and CECs to be open to cross-border participation, though Brussels' regulations on proximity could potentially accommodate cross-border sharing. Flanders allows energy communities to define their own concept of proximity, which could theoretically extend across borders. France's Energy Code lacks provisions for RECs and CECs to be open to cross-border participation. The current legal framework in both countries is insufficient for developing cross-border energy communities, with participatory financing being the primary avenue for cross-border renewable energy projects.
	Private/Public financing instruments	Despite these limitations, some mechanisms exist that could potentially support cross-border energy initiatives, e.g. the Interreg VI A France-Wallonie-Vlaanderen Programme and the Interreg VI A Grande Région Programme. While not specifically designed for CBECs, these frameworks can potentially examine, test and improve the framework conditions for cross-border energy cooperation between Belgium and France, highlighting the need for targeted legislative action to fully enable cross-border energy communities. E.g., the Interreg VI-A France-Wallonie-Vlaanderen Programme 2021-2027 includes the specific objective 6.3 of "Building mutual trust, in particular by encouraging 'people to people' actions". This might include fostering cross-border connections and cooperation between communities on either side of the border. In addition, Interreg B programmes such as the Interreg North-West Europe Programme 2021-2027 with a priority focus on energy transition and relevant projects (e.g. the ECCO project dedicated to accelerate the growth of local Energy Community

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Categories	Indicators	Description
	Partnerships available	Co-Operatives funded during the 2014-2020 period which fed into to the 'Energy Community Platform', as well as Interreg Europe (for example, the 2021-2027 project REC4EU – Renewable Energy Communities for EU regions) can also be used to positively influence framework conditions for cross-border energy initiatives. Moreover, in the 2021–2027 period, the Connecting Europe Facility (CEF) introduced a new category of eligible projects under its energy Programme: cross-border projects in the field of renewable energy. This addition is designed to enhance cross-border collaboration, recognizing the importance of regional cooperation in accelerating the deployment of renewable energy. The CEF Energy complements other EU funding Programmes for renewables by specifically targeting initiatives that bridge national efforts, creating synergies that optimize resource use and infrastructure. New partnerships might also be supported by existing cross-border cooperation bodies and EGTCs, such as the Eurometropolis Lille-Kortrijk-Tournai. One example of a relevant project was the Interreg 2 Seas project (2020-2023) LECSea with partners from Belgium, France, The Netherlands and the UK that stimulated the take-off of energy communities (ECs) also in the BE-FR cross-border area by developing new cooperation models, lighthouse projects, tools and services, thus enabling consumers (citizens, businesses, public authorities) to change their role.

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Categories	Indicators	Description
Energy Communities	Transposition for energy communities and support measures	There is no unique approach to energy communities in Belgium. The Brussels region has implemented four energy community definitions, emphasizing autonomy, openness, and voluntary participation. The energy regulator, Brugel, has significant authority to register, monitor, and ensure compliance, while the NGO Energie Commune provides support. In Flanders, energy communities are framed as a single concept with slight distinctions for Citizen CECs and RECs, with the entity 'VREG' responsible for monitoring. An initial energy-sharing framework is being developed, but a comprehensive enabling framework for energy communities in general is still lacking. In Wallonia, the entity 'CWaPE' monitors energy communities but lacks a supportive framework, particularly for capacity building. France transposed the definitions of both RECs and CECs from the relevant EU Directives. The definitions emphasize autonomy based on company law, with upcoming regulations detailing control and geographical proximity. A key difference is eligibility: RECs have strict company restrictions, while CECs allow unrestricted participation, posing a risk of market actor dominance. The definitions largely mirror EU directives, but the lack of regulatory monitoring could lead to misuse and trust issues.
General and Electricity Network	Organisation of the national electricity network	Interconnection levels of the national electricity networks are very good. The national power grids of Belgium and France are organized to ensure stability and efficiency in power transmission and distribution. Both countries have integrated transmission systems operated by their respective TSOs to facilitate the safe and adequate cross-border flow of electricity. Harmonization of grid operations and regulatory practices are in line with EU and ENTSO-E regulations. Overall, there is strong network integration, supported by high-voltage interconnections. Market coupling mechanisms allow seamless cross-border trade. The transfer of electricity between Belgium and France is facilitated by interconnected networks that enable electricity exchange according to European market rules. This interconnection
	Electricity transfer and heat transfer	

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Categories	Indicators	Description
	Congestion Management	facilitates the balancing of supply and demand, contributing to energy security and the integration of nuclear energy. Belgium and France are connected by several key 220 kV and 400 kV transmission lines, including the Tihange-Bavay and Avelin-Tournai interconnections. These lines are critical for electricity exchange between the two countries, facilitating the sharing of power and ensuring grid stability, particularly during peak demand periods. The countries do not have an interconnected network for heat exchange. Belgium and France actively collaborate on congestion management to ensure the reliability and stability of their interconnected power grids and the entire European electricity grid. They use coordinated measures, such as market mechanisms and real-time grid management and dispatching tools, to manage grid imbalances according to EU guidelines to promote efficient cross-border electricity trade and grid security and reliability. Additionally, aligning tariffs, grid fees, and regulations will ensure fair access for decentralized energy producers. Leveraging EU funding programmes and coordinating through ENTSO-E will be essential to strengthening cross-border electricity exchange and supporting a resilient and efficient energy network.

Belgium-Germany

Categories	Indicators	Description
Cross-border Energy Communities	Legal framework for cross-border energy communities	Cross-border energy communities (CBECs) between Belgium and Germany face regulatory challenges due to divergent and often insufficient legislative frameworks. Germany's Renewable Energy Act 2023 restricts energy community membership to residents registered in Germany, effectively excluding non-German participants, while not providing provisions for RECs and CECs to be open to cross-border participation. Germany additionally lacks a legal framework for energy sharing and faces challenges with grid connections in multi-unit buildings. The absence of clear guidelines, particularly for energy sharing in Germany, further complicates the establishment of CBECs. Belgium's approach varies by region: the federal level does not address CBECs and does not provide provisions for RECs and CECs to be open to cross-border participation, Brussels encourages local sharing but potentially allows for cross-border participation, Flanders permits energy communities to define their own proximity concept, and Wallonia's legislation does not mention CBECs.
	Private/Public financing instruments	Some cooperation programmes might provide funding and support to develop CBECs and other cross-border energy initiatives. These include the Interreg VI A Grande Région Programme 2021-2027 and the INTERREG VI-A Meuse-Rhine Programme 2021-2027. Both programmes promote a better cooperation governance and more integration across borders. Projects can help to create favourable framework conditions for CBEC and quasi-CBECs. Moreover, the Interreg VI A Meuse-Rhine Programme 2021-2027 includes investments on Cohesion Policy Objective 2 for a Greener Europe and hence supports projects that promote cross-border renewable energy solutions such as CBECs (SO 2.2). In addition, Interreg B programmes such as the Interreg North-West Europe Programme 2021-2027 with a priority focus

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Categories	Indicators	Description
	Partnerships available	on energy transition and relevant projects (e.g. the ECCO project dedicated to accelerate the growth of local Energy Community Co-Operatives of the 2014-2020 period which fed into to the 'Energy Community Platform'), as well as Interreg Europe (for example, the 2021-2027 project REC4EU – Renewable Energy Communities for EU regions) can also be used to positively influence framework conditions for cross-border energy initiatives. Moreover, in the 2021–2027 period, the Connecting Europe Facility (CEF) introduced a new category of eligible projects under its energy Programme: cross-border projects in the field of renewable energy. This addition is designed to enhance cross-border collaboration, recognizing the importance of regional cooperation in accelerating the deployment of renewable energy. The CEF Energy complements other EU funding Programmes for renewables by specifically targeting initiatives that bridge national efforts, creating synergies that optimize resource use and infrastructure. The EGTC Euregio Meuse-Rhine, which covers the cross-border area between Belgium, Germany, and The Netherlands, provides a good foundation for cross-border collaboration. One example of a relevant energy cooperation project is the MAS4TE project, funded by Interreg VI A Meuse Rhine Programme (2021-2027), which aims to create a cross-border energy exchange platform for prosumers. Based on blockchain and artificial intelligence technologies, it facilitates local energy trading and storage by integrating citizens into decentralized energy management, contributing to the energy transition in the Meuse-Rhine region.
Energy Communities	Transposition for energy communities and support measures	There is no unique approach to energy communities in Belgium. The Brussels region has established four definitions related to energy communities, focusing on autonomy and ensuring openness and voluntary participation through objective, transparent, and non-discriminatory criteria. The Brugel energy regulator has significant authority to register, monitor, and ensure

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Categories	Indicators	Description
		compliance. The NGO Energie Commune provides information and support, and lending Programmes have been introduced to support energy community growth. In Flanders, the Energy Decree transposes energy community definitions, with Citizen CECs and RECs representing different aspects. The VREG national regulator registers and monitors communities, but a comprehensive enabling framework is lacking. In Wallonia, the legislation provides detailed definitions within its regional context, with the CWaPE regulator overseeing compliance. The framework for energy sharing and enabling support is incomplete. Germany integrated the REC concept into its existing framework by amending the definition of "citizen energy company" under the Renewable Energy Act 2022, with support managed by the National Energy Regulator. Recent improvements to the renewables support scheme address past shortcomings but still lack a comprehensive enabling and regulatory framework to facilitate energy sharing among RECs. In German law, there is no direct equivalent to the concept of a 'citizen energy community' as defined in the Internal Electricity Market Directive.
General and Electricity Network	Organisation of the national electricity network	Interconnection levels of the national electricity networks are very good. The national power grids of Belgium and Germany are organized to ensure stability and efficiency in power transmission and distribution. Both countries have integrated transmission systems operated by their respective TSOs to facilitate the safe and adequate cross-border flow of electricity. Harmonization of grid operations and regulatory practices are in line with EU and ENTSO-E regulations. Overall, there is a strong integration with well-developed transmission infrastructure supporting market-based electricity flows. Key interconnection projects such as ALEGrO (Aachen Liège Electricity Grid Overlay) enhance energy flows. The transfer of electricity between Belgium and Germany is facilitated by interconnected networks that enable electricity exchange according to European market rules. This interconnection
	Electricity transfer and heat transfer	

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Categories	Indicators	Description
	Congestion Management	facilitates the balancing of supply and demand, contributing to energy security and the integration of nuclear energy end exports from Belgium to Germany. Belgium and Germany are connected by key 220 kV and 380 kV transmission lines, including the Aachen-Herstal and Lixhe-Düren interconnections, which play a crucial role in facilitating electricity exchange between the two countries. The countries do not have an interconnected network for heat exchange. Belgium and Germany actively collaborate on congestion management to ensure the reliability and stability of their interconnected power grids and the entire European electricity grid. They use coordinated measures, such as market mechanisms and real-time grid management and dispatching tools, to manage grid imbalances according to EU guidelines to promote efficient cross-border electricity trade and grid security and reliability. Belgium and Germany regularly invest in enhancing the capacity and flexibility of their electricity grid infrastructure to accommodate growing renewable energy generation and increased cross-border electricity exchanges. Ongoing projects aim to strengthen existing interconnections, such as the Aachen-Herstal line and others, and improve grid resilience. Aligning tariffs, grid fees, and regulations will ensure fair access for decentralized energy producers. Leveraging EU funding programmes and coordinating through ENTSO-E will be essential to strengthening cross-border electricity exchange and supporting a resilient and efficient energy network.

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Belgium-Luxembourg

Categories	Indicators	Description
Cross-border Energy Communities	Legal framework for cross-border energy communities	CBECs between Belgium and Luxembourg face regulatory challenges due to limited legislative support in both countries. In Belgium, the approach varies by region: the federal level does not address CBECs and does not provide provisions for RECs and CECs to be open to cross-border participation, Brussels encourages local sharing but potentially allows for cross-border participation, Flanders permits energy communities to define their own proximity concept, and Wallonia's legislation does not mention CBECs. Luxembourg's Act on the Organisation of the Electricity Market does not include provisions for RECs and CECs to be open to cross-border participation and restricts Renewable Energy Communities (RECs) to specific geographical areas within the country, limiting cross-border potential. Despite these regulatory limitations, there are frameworks that could potentially support cross-border energy initiatives. The Interreg VI A Grande Région Programme supports cross-border cooperation between public institutions, private organisations and citizens. Interreg projects might be used to test the establishment of energy communities in a cross-border context.
	Private/Public financing instruments	In addition, Interreg B programmes such as the Interreg North-West Europe Programme 2021-2027 with a priority focus on energy transition and relevant projects already in the past (e.g. the ECCO project dedicated to accelerate the growth of local Energy Community Co-Operatives of the 2014-2020 period which fed into to the 'Energy Community Platform'), as well as Interreg Europe (for example, the 2021-2027 project REC4EU – Renewable Energy Communities for EU regions) can also be used to positively influence framework conditions for cross-border energy initiatives. Moreover, in the 2021–2027 period, the Connecting Europe Facility (CEF) for Energy introduced a new category of eligible projects: cross-border projects

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Categories	Indicators	Description
	Partnerships available	in the field of renewable energy. This addition is designed to enhance cross-border collaboration, recognizing the importance of regional cooperation in accelerating the deployment of renewable energy. The CEF Energy programme complements other EU funding Programmes for renewables by specifically targeting initiatives that bridge national efforts, creating synergies that optimize resource use and infrastructure. While the absence of explicit provisions for CBECs in both countries' legislation presents challenges, it also highlights the potential for growth in cross-border energy communities. The evolving landscape emphasizes the need for harmonized legislation and dedicated support mechanisms to foster the development of cross-border energy communities between Belgium and Luxembourg. The Benelux Union, of which both Belgium and Luxembourg are founding members, provides a strong foundation for cross-border cooperation in various sectors, including energy. In addition, there are several local cooperation structures that can be a starting point for CBEC or Q-CBEC.

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Categories	Indicators	Description
Energy Communities	Transposition for energy communities and support measures	There is no unique approach to energy communities in Belgium. The Brussels region has defined energy communities, emphasizing autonomy and transparent, voluntary participation based on non-discriminatory criteria. While no specific legal forms are outlined, the energy regulator, Brugel, has authority to ensure compliance. The NGO Energie Commune offers guidance, and lending Programmes support growth. In Flanders, the Energy Decree unifies energy community definitions, with VREG overseeing registration and monitoring. A framework for energy sharing is emerging, though further development is needed. Wallonia's legislation defines terms regionally, with CWaPE responsible for monitoring compliance. However, a comprehensive framework, especially for support, is lacking. Luxembourg has proposed only a REC definition but omitted key EU criteria like openness and autonomy. Additionally, the definition of geographical proximity is overly narrow and fails to consider the technical characteristics of different activities. However, the national agency Klima Agence provides information on energy communities, and it introduced temporary investment aid schemes to support renewable energy communities.
General and Electricity Network	Organisation of the national electricity network	The national power grids of Belgium and Luxembourg are very well integrated. They are organized to ensure stability and efficiency in power transmission and distribution. Both countries have integrated transmission systems operated by their respective transmission system operators (TSOs) to facilitate the safe and adequate cross-border flow of electricity. Harmonization of grid operations and regulatory practices are in line with EU and ENTSO-E regulations. Overall, significant interconnection capacity allowing Luxembourg to source part of its electricity from Belgium.
	Electricity transfer and heat transfer	

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Categories	Indicators	Description
	Congestion Management	according to European market rules. This interconnection facilitates the balancing of supply and the low demand of Luxembourg. Belgium and Luxembourg are interconnected through key 220 kV and 110 kV transmission lines, including the Tavigny-Redange and Hasselt-Luxembourg interconnections. These connections allow electricity to flow between the two countries, ensuring stability and reliable power exchange. The countries do not have an interconnected network for heat exchange. Belgium and Luxembourg actively collaborate on congestion management to ensure the reliability and stability of their interconnected power grids and the entire European electricity grid. They use coordinated measures, such as market mechanisms and real-time grid management and dispatching tools, to manage grid imbalances according to EU guidelines to promote efficient cross-border electricity trade and grid security and reliability. Aligning tariffs, grid fees, and regulations will ensure fair access for decentralized energy producers. Leveraging EU funding programs and coordinating through ENTSO-E will be essential to strengthening cross-border electricity exchange and supporting a resilient and efficient energy network.

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Belgium-Netherlands

Categories	Indicators	Description
Cross-border Energy Communities	Legal framework for cross-border energy communities	CBECs between Belgium and the Netherlands face some regulatory challenges due to limited support and inconsistent legislative frameworks. In Belgium, the federal level does not address CBECs and does not provide provisions for RECs and CECs to be open to cross-border participation, while regional approaches vary: Brussels allows for potential cross-border participation, Flanders permits energy communities to define their own proximity concept, and Wallonia's legislation does not mention CBECs. The Netherlands' Energy Act 2022 defines Renewable Energy Communities (RECs) but lacks provisions for RECs and CECs to be open to cross-border participation. The 1998 Electricity Act prohibits decentralized and cross-border electricity exchange through the distribution system.
	Private/Public financing instruments	Despite these regulatory barriers, there are initiatives and frameworks that could potentially support cross-border energy cooperation: the Interreg VI-A Flanders-Netherlands Programme supports cross-border projects in different fields: e.g., the specific objective D '<i>A Europe without borders</i>', seeks to remove or reduce barriers at borders that hinder interaction and cooperation among citizens, businesses, civil society, and public authorities, and thus, one instrument to support it could be CBECs. Furthermore, the programme finances projects related to Cohesion Policy Objective 2 on Greener Europe, including renewable energy community projects (Priority B). One project example is FACILEX - FACilitating Interregional Local Energy eXchange, that aims to overcome crucial barriers such as legal complexity, spatial challenges and administrative issues for energy exchange across borders. On the one hand, it focuses on concrete energy exchanges to overcome the various border obstacles. For instance, information is already being exchanged on residual heat from BASF (BE) and the heat demand due to Glastuinbouw Rilland (NL). A second example is the exchange of electricity in the Hazeldonk-Meer transport zone. Additional wind turbines will be provided or existing ones will be made more powerful, companies will share energy thanks to the creation of an energy community in order to better coordinate production and off-take,
	Partnerships available	

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Categories	Indicators	Description
		and existing filling stations will be provided with sufficient electricity and loading capacity. On the other hand, policy recommendations will be formulated on the basis of the problems revealed by the various cases. Thanks to the realisation of a border consultation, knowledge exchange and competence building will become possible for the drafting of regional policy visions and their translation in the field. A favourable framework can be also the EGTC Euregio Meuse-Rhine, spanning Belgium, the Netherlands, and Germany. In addition, Interreg B programmes such as the Interreg North-West Europe Programme 2021-2027 with a priority focus on energy transition and relevant projects already in the past (e.g. the ECCO project dedicated to accelerate the growth of local Energy Community Co-Operatives of the 2014-2020 period which fed into to the 'Energy Community Platform'), as well as Interreg Europe (for example, the 2021-2027 project REC4EU – Renewable Energy Communities for EU regions) can also be used to positively influence framework conditions for cross-border energy initiatives. In the 2021–2027 period, the Connecting Europe Facility (CEF) Energy introduced a new category of projects: cross-border projects in the field of renewable energy. This addition is designed to enhance cross-border collaboration, recognizing the importance of regional cooperation in accelerating the deployment of renewable energy. The CEF Energy complements other EU funding Programmes for renewables by specifically targeting initiatives that bridge national efforts, creating synergies that optimize resource use and infrastructure. While the current lack of harmonized regulations and specific support mechanisms for CBECs presents challenges, it also highlights the opportunity for innovation in developing feasible business models for local cross-border energy cooperation. The absence of explicit provisions for cross-border participation in both countries' legislation presents barriers, but this situation emphasizes the potential for coordinated legislative action and tailored instruments to enable the development of CBECs between Belgium and the Netherlands.

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Categories	Indicators	Description
Energy Communities	Transposition for energy communities and support measures	There is no unique approach to energy communities in Belgium. The Brussels region has defined energy communities, emphasizing autonomy and ensuring openness and voluntary participation based on transparent, non-discriminatory criteria. The energy regulator, Brugel, has significant authority to monitor compliance, while the NGO Energie Commune offers support and guidance. In Flanders, the Energy Decree frames energy communities as a single concept, with the entity 'VREG' overseeing registration and monitoring. A framework for energy sharing is emerging but is still incomplete. Wallonia's legislation defines terms regionally, with the entity 'CWaPE' responsible for compliance, though a comprehensive support framework is lacking. In The Netherlands, REC and CEC definitions are unified into a single "energy community" concept. The Dutch Climate Agreement aims for 50% local ownership of renewable energy by 2030, but many elements, like energy sharing and DSO cooperation, remain underdeveloped.
General and Electricity Network	Organisation of the national electricity network	The national power grids of Belgium and Netherlands are very well integrated. They are organized to ensure stability and efficiency in power transmission and distribution. Both countries have integrated transmission systems operated by their respective transmission system operators (TSOs) to facilitate the safe and adequate cross-border flow of electricity. Harmonization of grid operations and regulatory practices are in line with EU and ENTSO-E regulations. Overall, the Netherlands and Belgium share extensive transmission infrastructure, ensuring energy security and efficient integration of renewable resources. The transfer of electricity between Belgium and Netherlands is facilitated by interconnected networks that enable electricity exchange according to European market rules. This interconnection facilitates the balancing of supply and demand, contributing to energy security and the integration of nuclear energy and exports from Belgium. Belgium and the Netherlands are interconnected by multiple 220 kV and 380 kV transmission lines, such as the Maasbracht-Maasmechelen and Zandvliet-Geleen interconnections. These lines allow for the efficient exchange of electricity between the two countries,
	Electricity transfer and heat transfer	
	Congestion Management	

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Categories	Indicators	Description
		ensuring reliable power flows and grid stability. Belgium and the Netherlands have been investing in the expansion and upgrading of their electricity grids to accommodate growing energy demand and the increasing share of renewable energy. Both countries are enhancing interconnection capacity, with projects like the Brussels-Antwerp interconnection aimed at improving the efficiency and reliability of electricity exchanges. The countries do not have an interconnected network for heat exchange. Belgium and Netherlands actively collaborate on congestion management to ensure the reliability and stability of their interconnected power grids and the entire European electricity grid. They use coordinated measures, such as market mechanisms and real-time grid management and dispatching tools, to manage grid imbalances according to EU guidelines to promote efficient cross-border electricity trade and grid security and reliability. Aligning tariffs, grid fees, and regulations will ensure fair access for decentralized energy producers. Leveraging EU funding programmes and coordinating through ENTSO-E will be essential to strengthening cross-border electricity exchange and supporting a resilient and efficient energy network.

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Bulgaria-Greece

Categories	Indicators	Description
Cross-border Energy Communities	Legal framework for cross-border energy communities	CBECs between Bulgaria and Greece face significant regulatory challenges due to the absence of supportive legislation in both countries. Bulgaria's Law on Energy from Renewable Sources defines Renewable Energy Communities (RECs) but with unclear geographical proximity requirements that appear to restrict RECs to urban areas, and it does not include provisions for RECs to be open to cross-border participation. Similarly, Greece's Law 5037/2023 does not address provisions for RECs and CECs to be open to cross-border participation.
	Private/Public financing instruments	Despite these regulatory gaps, there are several initiatives and frameworks that could potentially contribute to strengthen and promote cross-border energy cooperation. One framework that might support cross-border energy cooperation and new initiatives in this field is the Interreg VI-A Greece-Bulgaria Programme 2021-2027 which offers support for cross-border projects and the analysis and reduction of cross-border obstacles. In addition, Interreg B programmes, covering the border, as well as Interreg Europe (for example, the 2021-2027 project REC4EU – Renewable Energy Communities for EU regions) can also be used to positively influence framework conditions for cross-border energy initiatives. Moreover, in the 2021–2027 period, the Connecting Europe Facility (CEF) Energy Programme introduced a new category of projects: cross-border projects in the field of renewable energy. This addition is designed to enhance cross-border collaboration, recognizing the importance of regional cooperation in accelerating the deployment of renewable energy. The CEF Energy programme complements other EU funding Programmes for renewables by specifically targeting initiatives that bridge national efforts,

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Categories	Indicators	Description
	Partnerships available	creating synergies that optimize resource use and infrastructure. While the lack of specific provisions for CBECs in both countries' energy policies is a challenge, it also opens up opportunities for developing innovative solutions. The absence of clear definitions and regulations for cross-border participation in energy communities highlights the potential for creating tailored frameworks that can support the growth of local cross-border energy cooperation. This situation encourages collaboration and offers a chance to shape new business models that can effectively address the needs of both sides of the border. The ongoing work to connect the day-ahead electricity markets of both countries could facilitate cross-border energy trading and potentially support energy communities. Both countries participate in the Central and South-Eastern Europe Energy Connectivity (CESEC) Initiative, a regional cooperation platform aimed at accelerating the integration of gas and electricity markets in the region. The Greece-Bulgaria Interconnector (IGB), while focused on natural gas, demonstrates significant cross-border energy cooperation between the two countries.

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Categories	Indicators	Description
Energy Communities	Transposition for energy communities and support measures	Both Bulgaria and Greece are in the early stages of establishing and promoting domestic energy communities. Bulgaria concluded the transposition, however replicating EU Directives and tailoring to the local needs. While a national legal foundation for an enabling framework for RECs is in place, there remains a need to develop concrete policies and measures to operationalize this framework. Notably, the enabling framework for CECs mirrors that of RECs, surpassing the mandates of the IMED Directive. This approach aims to establish a unified and comprehensive enabling framework that accommodates both RECs and CECs seamlessly. Greece has existing legislation but with missing elements for a complete enabling framework. The presence of three distinct definitions for energy communities, from previous legislation, along with the various provisions regulating these entities, increases legal complexity and poses a significant regulatory barrier to the development of energy communities in Greece.
General and Electricity Network	Organisation of the national electricity network	Interconnection levels of the national electricity networks are regular. The national power grids of Bulgaria and Greece are organized to ensure stability and efficiency in power transmission and distribution. Both countries have integrated transmission systems operated by their respective TSOs to facilitate the safe and adequate cross-border flow of electricity. Harmonization of grid operations and regulatory practices are in line with EU and ENTSO-E regulations. Overall, some integration exists, but technical and regulatory challenges hinder deeper cooperation.
	Electricity transfer and heat transfer	The transfer of electricity between Bulgaria and Greece is facilitated by interconnected networks that enable electricity exchange according to European market rules. This interconnection facilitates the balancing of supply and demand, contributing to energy security and the integration of high shares of renewable energy in Greece. Bulgaria and Greece are interconnected through

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Categories	Indicators	Description
	Congestion Management	key 400 kV transmission lines, such as the Haidari (Greece) - Maritsa (Bulgaria) line. These interconnections enable the exchange of electricity, ensuring a stable and reliable flow of power between the two countries. The countries do not have an interconnected network for heat exchange. Bulgaria and Greece actively collaborate on congestion management to ensure the reliability and stability of their interconnected power grids and the entire European electricity grid. The two countries have been working on connecting their day-ahead electricity markets, which could facilitate cross-border energy trading and potentially support energy communities. They use coordinated measures, such as market mechanisms and real-time grid management and dispatching tools, to manage grid imbalances according to EU guidelines to promote efficient cross-border electricity trade and grid security and reliability. Aligning tariffs, grid fees, and regulations will ensure fair access for decentralized energy producers. Leveraging EU funding programmes and coordinating through ENTSO-E will be essential to strengthening cross-border electricity exchange and supporting a resilient and efficient energy network.

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Bulgaria-Romania

Categories	Indicators	Description
Cross-border Energy Communities	Legal framework for cross-border energy communities	CBECs between Bulgaria and Romania face a complex regulatory landscape with differing approaches in each country. Bulgaria's Law on Energy from Renewable Sources defines RECs with unclear geographical proximity requirements that appear to restrict RECs to urban areas and notably does not include provisions for RECs to be open to cross-border participation. This lack of clarity and the apparent urban focus could pose significant barriers to cross-border initiatives. Romania's approach is more open to cross-border participation, at least in principle. The Ordinance no. 143 of December 28, 2021, which defines CECs, explicitly mentions the possibility of cross-border participation and non-discriminatory access to electricity markets. However, this theoretical openness is limited by the absence of specific support mechanisms to facilitate such arrangements. Furthermore, the Emergency Ordinance no. 163 of November 29, 2022, which defines RECs, does not outline any provisions for CBECs.
	Private/Public financing instruments	Despite these regulatory challenges, the Interreg VI A Romania-Bulgaria Programme 2021-2027 offers a framework for cross-border projects also for integrated territorial development which might include energy-related initiatives. Investments under Cohesion Policy Objective 5 will focus on supporting the integrated territorial development of the cross-border area. While there is a focus on tourism, also energy initiatives might be of interest in common territorial planning. In addition, Interreg B programmes such as the Interreg Central Europe Programme 2021-2027 (with its 2021-2027 project HERCULES-CE to enhance the energy transition in Central Europe with the support of renewable energy communities) or the Interreg Danube Programme 2021-2027 (with the 2021-2027 projects NRGCOM and DECA dedicated to accelerate RECs and CECs and create appropriate operational conditions for energy communities in the Danube region), as well

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Categories	Indicators	Description
	Partnerships available	as Interreg Europe (for example, the 2021-2027 project REC4EU – Renewable Energy Communities for EU regions) can also be used to positively influence framework conditions for cross-border energy initiatives. Moreover, in the 2021–2027 period, the Connecting Europe Facility (CEF) Energy programme introduced a new category of projects: cross-border projects in the field of renewable energy. This addition is designed to enhance cross-border collaboration, recognizing the importance of regional cooperation in accelerating the deployment of renewable energy. The CEF Energy complements other EU funding Programmes for renewables by specifically targeting initiatives that bridge national efforts, creating synergies that optimize resource use and infrastructure. There is an untapped potential at this border for strengthening ties between neighbouring cities along the Romania-Bulgaria border. Joint urban planning initiatives may encourage shared growth by harmonizing infrastructure development, energy projects and public services. Collaborative efforts in urban design can also create integrated economic zones and promote efficient resource use and enhance the quality of life for residents on both sides of the border. To exploit these potential additional resources might be needed. The differences between Bulgarian and Romanian regulations create a unique landscape for potential CBECs. Romania's more open stance offers opportunities for participation in CBECs, while the lack of specific support mechanisms and Bulgaria's less defined approach introduces challenges.
Energy Communities	Transposition for energy communities and support measures	Bulgaria and Romania are at similar stages, with both having transposed the relevant EU Directives but lacking concrete measures for enabling frameworks and support schemes. Bulgaria concluded the transposition, replicating EU Directives and tailoring to the local needs. While a national legal foundation for an enabling

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Categories	Indicators	Description
		framework for RECs is in place, there remains a need to develop concrete policies and measures to operationalize this framework. Notably, the enabling framework for CECs mirrors that of RECs, surpassing the mandates of the IMED Directive. This approach aims to establish a unified and comprehensive enabling framework that accommodates both RECs and CECs seamlessly. The Romanian government adopted an Ordinance to transpose CECs into national legislation in 2021. For the most part, this legislation was directly replicating the CEC provisions from the IMED Directive. To transpose the REDII Directive, Romania passed an Emergency Ordinance in November 2022. For the most part, it takes the same approach as the transposition of CECs. The National Regulator, ANRE, take on much of the responsibility for the implementation of RECs and CECs at national level. While an enabling framework is seen as an outcome in national legislation, the details of the enabling framework, and support for RECs, must still emerge through concrete policies and measures.
General and Electricity Network	Organisation of the national electricity network	Interconnection levels of the national electricity networks are rather limited. The national power grids of Bulgaria and Romania are organized to ensure stability and efficiency in power transmission and distribution. Both countries have integrated transmission systems operated by their respective TSOs to facilitate the safe and adequate cross-border flow of electricity. Harmonization of grid operations and regulatory practices are in line with EU and ENTSO-E regulations.
	Electricity transfer and heat transfer	The transfer of electricity between Bulgaria and Romania is facilitated by interconnected networks that enable electricity exchange according to European market rules. This interconnection facilitates the balancing of supply and demand, contributing to energy security and the integration of renewable energy. Bulgaria and Romania are interconnected through multiple 400 kV and 110 kV transmission lines, including the Maritsa (Bulgaria) – Cernavodă (Romania) and Varna (Bulgaria) – Constanța (Romania) interconnections. These transmission lines facilitate the exchange of electricity, enabling stable and reliable power flows between the two countries. However, the Danube serves as a natural barrier, with grid integration hindered by technical and market limitations. The
	Congestion Management	

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Categories	Indicators	Description
		countries do not have an interconnected network for heat exchange. Bulgaria and Romania actively collaborate on congestion management to ensure the reliability and stability of their interconnected power grids and the entire European electricity grid. They use coordinated measures, such as market mechanisms and real-time grid management and dispatching tools, to manage grid imbalances according to EU guidelines to promote efficient cross-border electricity trade and grid security and reliability. Aligning tariffs, grid fees, and regulations will ensure fair access for decentralized energy producers. Leveraging EU funding programmes and coordinating through ENTSO-E will be essential to strengthening cross-border electricity exchange and supporting a resilient and efficient energy network.

Croatia-Hungary

Categories	Indicators	Description
Cross-border Energy Communities	Legal framework for cross-border energy communities	CBECs between Hungary and Croatia face significant regulatory barriers due to extremely restrictive legislation and a lacking national supportive framework. Hungary's Electricity Act LXXXVI stating in Article 66/B(3) that Energy Communities shall not engage in cross-border activities in matters governed by the Act. This creates a substantial obstacle to the formation of CBECs with Hungarian participation. Hungary's approach is explicitly prohibitive. Croatia's regulatory framework, while not explicitly prohibiting cross-border cooperation, imposes geographical limitations on energy communities. The Electricity Market Act and the Renewable Energy Law restrict the eligibility of energy communities based on geographical scope: - For Renewable Energy Communities (RECs), Croatia adopted the proximity principle directly from EU Directives, which may limit cross-border potential. - For Citizen Energy Communities (CECs), proximity is defined by the area of the local self-government unit where the community is headquartered, further constraining potential cross-border activities.

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Categories	Indicators	Description
	Private/Public financing instruments	Despite these regulatory challenges, there are potential avenues for cross-border cooperation in the energy sector. The Interreg VI A Hungary-Croatia Programme 2021-2027 offers a framework for cross-border projects, which could potentially include energy-related initiatives, although not specifically designed for energy communities. For the Interreg VI A Croatia-Hungary Programme 2021-2027, support is, among others, available for projects that contribute to clean energy transition and affordable utilisation of renewable energy resources (geothermal, solar etc.); combating energy poverty for households; supporting smart and innovative low emission technologies; fostering e-mobility as a clean energy transport solution; and raising commitment of citizens and empowering regional and local communities to energy consciousness and sustainable behaviour in line with EU Climate Pact. Furthermore, funding is possible for projects aiming at identifying solutions and institutional innovations that contribute to overcoming legal and administrative barriers in the cooperation of organisations in the border region; and improved public institutional capacities and skills in cross-border cooperation and strategic/sectoral planning. In addition, Interreg B programmes such as the Interreg Central Europe Programme 2021-2027 (with its 2021-2027 project HERCULES-CE to enhance the energy transition in Central Europe with the support of renewable energy communities) or the Interreg Danube Programme 2021-2027 (with the 2021-2027 projects NRGCOM and DECA dedicated to accelerate RECs and CECs and create appropriate operational conditions for energy communities in the Danube region), as well as Interreg Europe (for example, the 2021-2027 project REC4EU – Renewable Energy Communities for EU regions) can also be used to positively influence framework conditions for cross-border energy initiatives. Moreover, in the 2021–2027 period, the Connecting Europe Facility (CEF) Energy programme introduced a new category of projects: cross-border projects in the field of renewable energy. This addition is designed to enhance cross-border collaboration, recognizing the importance of

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Categories	Indicators	Description
	Partnerships available	regional cooperation in accelerating the deployment of renewable energy. The CEF Energy complements other EU funding Programmes for renewables by specifically targeting initiatives that bridge national efforts, creating synergies that optimize resource use and infrastructure. Both countries participate in the Central and Southeastern Europe Energy Connectivity (CESEC) Initiative, a regional cooperation platform aimed at accelerating the integration of gas and electricity markets in the region. Initially targeting gas infrastructure and supply diversification, CESEC has expanded its scope to include comprehensive renewable energy strategies, creating significant opportunities for cross-border energy community initiatives. The platform includes 15 countries, spanning EU members and Energy Community contracting parties, which provides an extensive network for collaborative energy projects. Support for CBECs or similar initiatives can also come from two EGTCs within this area: the Pannon EGTC, established in 2010, has been enlarged with Croatian members since 2017, all border counties are included as well as numerous local governments and three organisations of regional significance from the Hungarian side; the Mura EGTC is a territorially concentrated yet very active partnership, established in 2015.
Energy Communities	Transposition for energy communities and support measures	In Croatia, the transposition of the energy community legal framework directly replicates the EU Directives. The framework imposes several restrictions that may discourage citizen participation. No support schemes have been established, and although some rules for energy sharing have been developed, there are no incentives for this activity. Additionally, other barriers related to registration and licensing currently make energy sharing impractical. Hungary, on the other hand, has struggled to combine both definitions into a coherent concept, currently REC defined as subset of CECs. Some criteria proposed by the EU Directives are still missing in national legislation, and, in more detail, the full transposition of the REDII Directive has not been achieved, notably excluding heating and cooling as eligible activities for RECs. So far, in Hungary, support schemes tend to prioritize for-profit companies, which may limit community involvement.

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Categories	Indicators	Description
General and Electricity Network	Organisation of the national electricity network	Interconnection levels of the national electricity networks are rather limited. The national power grids of Croatia and Hungary are organized to ensure stability and efficiency in power transmission and distribution. Both countries have integrated transmission systems operated by their respective TSOs to facilitate the safe and adequately cross-border flow of electricity. Harmonization of grid operations and regulatory practices are in line with EU and ENTSO-e regulations. Overall, there is a limited interconnection capacity, with infrastructure upgrades needed for better integration.
	Electricity transfer and heat transfer	The transfer of electricity between Croatia and Hungary is facilitated by interconnected networks that enable electricity exchange according to European market rules. This interconnection facilitates the balancing of supply and demand, contributing to energy security and the integration of renewable energy. Croatia and Hungary are interconnected through several 400 kV transmission lines, such as the Pecs (Hungary) – Osijek (Croatia) and Varazdin (Croatia) – Kaposvar (Hungary) interconnections. These lines enable the exchange of electricity, ensuring a reliable and stable flow of power between the two countries. The countries do not have an interconnected network for heat exchange.
	Congestion Management	Croatia and Hungary actively collaborate on congestion management to ensure the reliability and stability of their interconnected power grids and the entire European electricity grid. They use coordinated measures, such as market mechanisms and real-time grid management and dispatching tools, to manage grid imbalances according to EU guidelines to promote efficient cross-border electricity trade and grid security and reliability. Aligning tariffs, grid fees, and regulations will ensure fair access for decentralized energy producers. Leveraging EU funding programmes and coordinating through ENTSO-E will be essential to strengthening cross-border electricity exchange and supporting a resilient and efficient energy network.

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Croatia-Slovenia

Categories	Indicators	Description
Cross-border Energy Communities	Legal framework for cross-border energy communities	CBECs between Croatia and Slovenia face significant regulatory challenges due to limited and inconsistent legislative support. Croatia's regulatory framework, while not explicitly prohibiting cross-border cooperation, imposes significant geographical limitations on energy communities. The Electricity Market Act and the Renewable Energy Law restrict the eligibility of energy communities based on geographical scope: - For Renewable Energy Communities (RECs), Croatia adopted the proximity principle directly from EU Directives, which may limit cross-border potential. - For Citizen Energy Communities (CECs), proximity is defined by the area of the local self-government unit where the community is headquartered, further constraining potential cross-border activities. Slovenian legislation, including the Act on the promotion of renewable energy sources (ZSROVE), the Act on Electricity Supply (ZOEK), and Decree n. 4211, does not mention CBECs and does not provide provisions for RECs and CECs to be open to cross-border participation, creating a regulatory gap for cross-border initiatives.
	Private/Public financing instruments	Despite these challenges, there are several initiatives and frameworks that could potentially support cross-border energy cooperation. The Interreg VI A Slovenia-Croatia Programme 2021-2027 offers support for cross-border projects, which could include improving the framework for cross-border energy-related initiatives. It offers opportunities primarily through Priority Axis 3: Enhancing institutional capacity of public authorities and stakeholders and efficient public administration by promoting legal and administrative cooperation and cooperation between citizens and institutions. In addition, Interreg B programmes such as the Interreg Central Europe Programme 2021-2027 (with its 2021-2027 project HERCULES-CE to enhance the energy transition in Central Europe with the support of renewable energy communities) or the Interreg Danube Programme 2021-2027 (with the 2021-2027 projects NRGCOM and DECA dedicated to accelerate RECs and CECs and

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Categories	Indicators	Description
	Partnerships available	create appropriate operational conditions for energy communities in the Danube region), as well as Interreg Europe (for example, the 2021-2027 project REC4EU – Renewable Energy Communities for EU regions) can also be used to positively influence framework conditions for cross-border energy initiatives. Moreover, in the 2021–2027 period, the Connecting Europe Facility (CEF) Energy programme introduced a new category of projects: cross-border projects in the field of renewable energy. This addition is designed to enhance cross-border collaboration, recognizing the importance of regional cooperation in accelerating the deployment of renewable energy. The CEF Energy complements other EU funding Programmes for renewables by specifically targeting initiatives that bridge national efforts, creating synergies that optimize resource use and infrastructure. The cross-border cooperation on energy might benefit from the experience gained within two projects: 1. Cross-border cooperation in the energy sector is exemplified by the Green Switch project (funded by CEF-Energy), which involves transmission and distribution systems and network operators from Austria, Croatia, and Slovenia. While not specifically focused on CBECs, this project aims to optimize grid investment, increase hosting capacity for renewable sources, improve supply quality, and efficiently integrate new loads across borders. 2. The CEF funded SINCRO.GRID project, a smart grid initiative involving both countries, showcases cross-border energy cooperation, although not directly related to energy communities. The project, initiated in 2014 by Slovenian and Croatian energy operators, addressed the lack of flexibility resources caused by increased integration of decentralized renewable energy sources (RES). Recognized as a Project of Common Interest (PCI) by the European Commission in 2015, the project introduced innovative solutions, including compensation devices for reactive power control, a dynamic thermal rating system, a battery energy storage system, and a virtual cross-border control centre, enhancing the electricity systems of Slovenia, Croatia, and the broader region.

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Categories	Indicators	Description
Energy Communities	Transposition for energy communities and support measures	Croatia has adopted provisions on RECs and CECs in its national legislation. Rules for the registration of energy communities were also adopted. However, the Government has not yet undertaken an assessment of barriers or potential for the development of RECs. Furthermore, it has not articulated in detail any of the elements of the enabling framework. No support schemes have been established, and although some rules for energy sharing have been developed, there are no incentives for this activity. Additionally, other barriers related to registration and licensing currently make energy sharing impractical. Slovenia has made some progress, with the transposition of the relevant EU Directives and plans for enabling measures and support schemes. National legislation basically replicates the EU Directives and concrete measures are still missing.
General and Electricity Network	Organisation of the national electricity network	Interconnection levels of the national electricity networks are regular. The national power grids of Croatia and Slovenia are organized to ensure stability and efficiency in power transmission and distribution. Both countries have integrated transmission systems operated by their respective TSOs to facilitate cross-border flow of electricity. Harmonization of grid operations and regulatory practices are in line with EU and ENTSO-E regulations. Overall, good connectivity due to historical cooperation, but limited interconnection capacity. The transfer of electricity between Croatia and Slovenia is facilitated by interconnected networks that enable electricity exchange according to European market rules. This interconnection facilitates the balancing of supply and demand, contributing to energy security and the integration of renewable energy. Croatia and Slovenia are interconnected through multiple 400 kV transmission lines, such as the Pecine (Croatia) – Krško (Slovenia) interconnection and other high-voltage transmission lines. These lines enable reliable electricity exchange and secure the flow of electricity between the two countries. The countries do not have an interconnected network for heat exchange. Croatia and Slovenia actively collaborate on congestion management to ensure the reliability and stability of their interconnected power grids and the entire European electricity grid. They use
	Electricity transfer and heat transfer	
	Congestion Management	

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Categories	Indicators	Description
		coordinated measures, such as market mechanisms and real-time grid management and dispatching tools, to manage grid imbalances according to EU guidelines to promote efficient cross-border electricity trade and grid security and reliability. Aligning tariffs, grid fees, and regulations will ensure fair access for decentralized energy producers. Leveraging EU funding programmes and coordinating through ENTSO-E will be essential to strengthening cross-border electricity exchange and supporting a resilient and efficient energy network.

Czech Republic-Germany

Categories	Indicators	Description
Cross-border Energy Communities	Legal framework for cross-border energy communities	CBECs between the Czech Republic and Germany face some regulatory challenges due to the lack of supportive legislation in the Czech Republic and restrictive provisions in Germany. The Czech Republic's 2024 amendments to the Energy Act (Law n. 458/2000) do not mention provisions for RECs and CECs to be open to cross-border participation, creating a regulatory gap. Germany's Renewable Energy Act 2023 imposes limitations on energy community membership, restricting it to residents registered in Germany, which effectively excludes non-German participants, even those living near the border. This regulatory landscape presents substantial obstacles to establishing formal CBECs. Moreover, Germany additionally lacks a legal framework for energy sharing and faces challenges with grid connections in multi-unit buildings. The absence of clear guidelines, particularly for energy sharing in Germany, further complicates the establishment of CBECs. Despite these challenges, there are potential avenues for cross-border cooperation in the energy sector. The Interreg VI A Czech Republic-Bavaria Programme 2021-2027 offers support for cross-border projects, which could include support to energy-related initiatives. For example, Priority 5 focuses on improving cross-border governance by promoting cooperation in the legal and administrative fields. Favourable for CBECs could be projects in the area of promotion of networks and platforms that link the actors involved in order to achieve better coordination and greater effectiveness of individual cross-border cooperation measures. For example, the project "Hydrogen region Bavaria & Bohemia" will be supported with activities such as the analysis of the potential for hydrogen use in the area of mobility and industry, the analysis of the potential for hydrogen production and the creation of a cross-border regional concept. Similarly, the Interreg VI A Czech Republic-Saxony Programme 2021-2027 provides another framework for potential cross-border cooperation. The Programme offers under its Priority 4 the possibility to develop sectoral or multi-sectoral territorial strategies.
	Private/Public financing instruments	

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Categories	Indicators	Description
		In addition, Interreg B programmes such as the Interreg Central Europe Programme 2021-2027 (with its 2021-2027 project HERCULES-CE to enhance the energy transition in Central Europe with the support of renewable energy communities) or the Interreg Danube Programme 2021-2027 (with the 2021-2027 projects NRGCOM and DECA dedicated to accelerate RECs and CECs and create appropriate operational conditions for energy communities in the Danube region), as well as Interreg Europe (for example, the 2021-2027 project REC4EU – Renewable Energy Communities for EU regions) can also be used to positively influence framework conditions for cross-border energy initiatives. Moreover, in the 2021–2027 period, the Connecting Europe Facility (CEF) Energy programme introduced a new category of projects: cross-border projects in the field of renewable energy. This addition is designed to enhance cross-border collaboration, recognizing the importance of regional cooperation in accelerating the deployment of renewable energy. The CEF Energy complements other EU funding Programmes for renewables by specifically targeting initiatives that bridge national efforts, creating synergies that optimize resource use and infrastructure.
	Partnerships available	Cross-border structures such as the EUREGIO EGRENSIS or the Elbe/Labe Euroregion can help to bring relevant actors on both sides of the border together and to reduce the barrier effect of the border. Both structures support small-scale projects and establish networks of institutions and people.
Energy Communities	Transposition for energy communities and support measures	In January 2024, Czech Republic introduced legislation to regulate two types of energy communities, CECs and RECs, aligning EU principles with national needs. Although financing measures for energy communities are included in the National Recovery and Resilience Plan and the Modernisation Fund, there are no dedicated measures for energy communities within the national renewable support scheme. Germany has integrated the REC concept into its existing framework by amending the definition of

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Categories	Indicators	Description
		"citizen energy company" under the Renewable Energy Act 2022, with support managed by the National Energy Regulator. Recent improvements to the renewables support scheme address past shortcomings but still lack a comprehensive enabling and regulatory framework to facilitate energy sharing among RECs. In German law, there is no direct equivalent to the concept of a 'citizen energy community' as defined in the Internal Electricity Market Directive.
General and Electricity Network	Organisation of the national electricity network	Interconnection levels of the national electricity networks are good. The national power grids of Czech Republic and Germany are organized to ensure stability and efficiency in power transmission and distribution. Both countries have integrated transmission systems operated by their respective TSOs to facilitate the safe and adequate cross-border flow of electricity. Harmonization of grid operations and regulatory practices are in line with EU and ENTSO-E regulations. Overall, strong cross-border transmission, with Germany serving as a transit country for electricity flows across Central Europe. The transfer of electricity between Czech Republic and Germany is facilitated by interconnected networks that enable electricity exchange according to European market rules. This interconnection facilitates the balancing of supply and demand, contributing to energy security and the integration of renewable energy. The Czech Republic and Germany are connected through several high-voltage 400 kV transmission lines. These include the Waldmünchen (Germany) – Pilsen (Czech Republic) and Chvaletice (Czech Republic) – Laubegast (Germany) interconnections. These connections enable the flow of electricity between the two countries, ensuring a stable and reliable power exchange. The countries do not have an interconnected network for heat exchange. Czech Republic and Germany actively collaborate on congestion management to ensure the reliability and stability of their interconnected power grids and the entire European electricity grid. They use coordinated measures, such as market mechanisms and real-time grid management and dispatching tools, to manage grid imbalances
	Electricity transfer and heat transfer	
	Congestion Management	

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Categories	Indicators	Description
		according to EU guidelines to promote efficient cross-border electricity trade and grid security and reliability. Aligning tariffs, grid fees, and regulations will ensure fair access for decentralized energy producers. Leveraging EU funding programmes and coordinating through ENTSO-E will be essential to strengthening cross-border electricity exchange and supporting a resilient and efficient energy network.

Czech Republic-Poland

Categories	Indicators	Description
Cross-border Energy Communities	Legal framework for cross-border energy communities	CBEs between the Czech Republic and Poland face very significant regulatory challenges due to the lack of supportive legislation in the Czech Republic and restrictive provisions in Poland. 2024 amendments to Czech Republic's Energy Act (Law n. 458/2000) do not mention provisions for RECs and CECs to be open to cross-border participation, creating a regulatory gap. Poland's legislation, amended in July 2023, imposes several strong obstacles to cross-border participation: - CECs are restricted to operating within a single distribution system operator's area, with production connected to networks of no more than 110 kV. - RECs must be located within the same electricity distribution system operator's area. - Energy cooperatives face additional restrictions, limited to three directly neighbouring municipalities, excluding urban areas. - CECs are explicitly prohibited from including connections to other countries. This regulatory landscape presents substantial obstacles to establishing formal CBEs. The fact that Czech Republic lacks specific provisions for CBEs creates uncertainty regarding their legal status and operational framework. Poland's restrictive approach, with geographical limitations and explicit prohibition of cross-border connections

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Categories	Indicators	Description
		for CECs, directly hinders cross-border participation. Despite these challenges, there are potential avenues for cross-border cooperation in the energy sector. The Interreg VI A Czech Republic-Poland Programme 2021-2027 offers support for cross-border projects, which could include energy-related initiatives, although not specifically designed for energy communities. This creates opportunities for developing energy projects that support broader regional economic and environmental objectives. The Priority on the cooperation between institutions and residents provides an ideal mechanism for establishing cross-border networks, enabling knowledge exchange, collaborative project development, and creating platforms for joint sustainable initiatives between Czech and Polish regions. In addition, Interreg B programmes such as the Interreg Central Europe Programme 2021-2027 (with its 2021-2027 project HERCULES-CE to enhance the energy transition in Central Europe with the support of renewable energy communities) or the Interreg Danube Programme 2021-2027 (with the 2021-2027 projects NRGCOM and DECA dedicated to accelerate RECs and CECs and create appropriate operational conditions for energy communities in the Danube region), as well as Interreg Europe (for example, the 2021-2027 project REC4EU – Renewable Energy Communities for EU regions) can also be used to positively influence framework conditions for cross-border energy initiatives. Moreover, in the 2021–2027 period, the Connecting Europe Facility (CEF) Energy programme introduced a new category of projects: cross-border projects in the field of renewable energy. This addition is designed to enhance cross-border collaboration, recognizing the importance of regional cooperation in accelerating the deployment of renewable energy. The CEF Energy complements other EU funding Programmes for renewables by specifically targeting initiatives that bridge national efforts, creating synergies that optimize resource use and infrastructure. Further favourable framework for cooperation on energy can be the Euroregions in the cross-border
	Private/Public financing instruments	

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Categories	Indicators	Description
	Partnerships available	area, such as the Euroregion Silesia. Established in 1998, the aim of the Euroregion is to undertake joint activities for the economic and social development of the region and to bring its inhabitants and institutions closer together. The EGTC NOVUM provides a framework for cross-border cooperation between the two countries, which could potentially be leveraged for energy-related projects. Established in 2015, NOVUM's primary mission is to intensify and promote cross-border cooperation, knowledge, and create innovative approaches to sustainable energy transformation.
Energy Communities	Transposition for energy communities and support measures	In January 2024, new legislation was enacted in Czech Republic to provide clear definitions and regulations for two types of communities involved in the energy sector: CECs and RECs. The law aims to harmonize the definitions and ensure consistency in their application, drawing principles from EU provisions and adapting them to the national context. Although financing measures for energy communities are included in the national Recovery and Resilience Plan and the Modernisation Fund, there are no dedicated measures for energy communities within the national renewable support scheme. According to Polish legislation, RECs are introduced as a subset of CECs. The updated laws for CECs and RECs specify participation criteria, including decision-making and control mechanisms. The legislation also broadens the range of legal entities that can establish an energy community and clarifies permissible activities in the electricity, gas, and heating sectors. However, CECs are restricted to operating within a single distribution network area, significantly limiting their operational scope and ability to engage in diverse activities. Overall, the new legislation represents an improvement, as there was previously no legal framework for energy communities, though a comprehensive enabling framework is not in place so far.

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Categories	Indicators	Description
General and Electricity Network	Organisation of the national electricity network	Interconnection levels of the national electricity networks are regular. The national power grids of Czech Republic and Poland are organized to ensure stability and efficiency in power transmission and distribution. Both countries have integrated transmission systems operated by their respective TSOs to facilitate the safe and adequate cross-border flow of electricity. Harmonization of grid operations and regulatory practices are in line with EU and ENTSO-E regulations. Overall, adequate interconnection, but congestion and grid bottlenecks remain a challenge.
	Electricity transfer and heat transfer	The transfer of electricity between Czech Republic and Poland is facilitated by interconnected networks that enable electricity exchange according to European market rules. Czech Republic and Poland are interconnected through several high-voltage transmission lines, such as the Czech-Polish 400 kV interconnection. Key links include the Chmielów (Poland) – Hranice (Czech Republic) interconnection, which plays an essential role in facilitating electricity flows between the two countries. This interconnection facilitates the balancing of supply and demand, contributing to energy security and the integration of renewable energy. The countries do not have an interconnected network for heat exchange.
	Congestion Management	Czech Republic and Poland actively collaborate on congestion management to ensure the reliability and stability of their interconnected power grids and the entire European electricity grid. They use coordinated measures, such as market mechanisms and real-time grid management and dispatching tools, to manage grid imbalances according to EU guidelines to promote efficient cross-border electricity trade and grid security and reliability. Aligning tariffs, grid fees, and regulations will ensure fair access for decentralized energy producers. Leveraging EU funding programmes and coordinating through ENTSO-E will be essential to strengthening cross-border electricity exchange and supporting a resilient and efficient energy network.

Czech Republic-Slovakia

Categories	Indicators	Description
Cross-border Energy Communities	Legal framework for cross-border energy communities	CBECs between the Czech Republic and Slovakia face significant regulatory challenges due to the lack of supportive legislation in both countries. The regulatory landscape can be summarized as follows: for Czech Republic, the 2024 amendments to the Czech Energy Act (Law n. 458/2000) do not mention provisions for RECs and CECs to be open to cross-border participation, creating a regulatory gap. In Slovakia, Act 256/2022 of 22 June 2022, which amended Act 251/2012 on Energy, does not mention provisions for RECs and CECs to be open to cross-border participation. The amendment 363/2022 of 19 October 2022 to Act 309/2009 on Support for Renewable Energy Sources also does not address CBECs.
	Private/Public financing instruments	This regulatory landscape presents substantial obstacles to establishing formal CBECs. Both countries lack specific provisions for CBECs, creating uncertainty regarding their legal status and operational framework. The absence of clear regulations for cross-border participation in energy communities hinders potential collaborative efforts. Despite these challenges, there is a potential avenue for cross-border cooperation in the energy sector. The Interreg VI A Slovakia-Czech Republic Programme 2021-2027 offers support for cross-border projects, which could include energy-related initiatives. The programme foresees to strengthen and deepen the institutional cooperation in the area. Due to the relatively high degree of compatibility of public administration systems and relevant legislation on both sides of the border, many entities are involved in various forms of cooperation and many of them have long-standing partners on the opposite side of the border. The CBC programme continues to support them, focusing on identifying and reducing administrative and legislative barriers in different areas of life. In particular, interventions will be directed towards the establishment and further development of

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Categories	Indicators	Description
		partnerships between public administrations and cooperating entities. In addition, Interreg B programmes such as the Interreg Central Europe Programme 2021-2027 (with its 2021-2027 project HERCULES-CE to enhance the energy transition in Central Europe with the support of renewable energy communities) or the Interreg Danube Programme 2021-2027 (with the 2021-2027 projects NRGCOM and DECA dedicated to accelerate RECs and CECs and create appropriate operational conditions for energy communities in the Danube region), as well as Interreg Europe (for example, the 2021-2027 project REC4EU – Renewable Energy Communities for EU regions) can also be used to positively influence framework conditions for cross-border energy initiatives. Moreover, in the 2021–2027 period, the Connecting Europe Facility (CEF) Energy programme introduced a new category of projects: cross-border projects in the field of renewable energy. This addition is designed to enhance cross-border collaboration, recognizing the importance of regional cooperation in accelerating the deployment of renewable energy. The CEF Energy complements other EU funding Programmes for renewables by specifically targeting initiatives that bridge national efforts, creating synergies that optimize resource use and infrastructure.
	Partnerships available	Cross-border cooperation entities such as the Euroregions Pomoraví, White Carpathians and Beskydy create a local framework to foster cooperation on energy issues. They can be a starting point for new initiatives, CBEC and Q-CBEC.
Energy Communities	Transposition for energy communities and support measures	In January 2024, new legislation was enacted in Czech Republic to provide clear definitions and regulations for two types of communities involved in the energy sector: Energy Communities (CECs) and Renewable Energy Communities (RECs). The law aims to harmonize the definitions and ensure consistency in their application, drawing principles from EU provisions and adapting them to the national context. Although financing measures for

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Categories	Indicators	Description
		energy communities are included in the national Recovery and Resilience Plan and the Modernisation Fund, there are no dedicated measures for energy communities within the national renewable support scheme. Slovakia, on the other hand, is still in the early stages, with two definitions of RECs and CECs that reflect largely the definition provided in the relevant EU Directives. The Programme Slovensko was designed as a key national policy instrument and initiative to channel financial and technical support towards the development of energy communities. This programme is seen as a vital tool in overcoming current barriers to the growth of ECs in Slovakia. However, there are still several obstacles such as insufficient legal support, the need for an effective billing system, and the lack of economic analysis of the benefits of ECs.
General and Electricity Network	Organisation of the national electricity network	Interconnection levels of the national electricity networks are good. The national power grids of Czech Republic and Slovakia are organized to ensure stability and efficiency in power transmission and distribution. Both countries have integrated transmission systems operated by their respective TSOs to facilitate the safe and adequately cross-border flow of electricity. Harmonization of grid operations and regulatory practices are in line with EU and ENTSO-E regulations. Overall, it is a well-integrated network due to historical ties, with Slovakia relying on Czech energy imports.
	Electricity transfer and heat transfer	The transfer of electricity between Czech Republic and Slovakia is facilitated by interconnected networks that enable electricity exchange according to European market rules. This interconnection facilitates the balancing of supply and demand, contributing to energy security and the integration of renewable energy. The Czech Republic and Slovakia are interconnected through several high-voltage transmission lines, including the 400 kV lines, which enable electricity exchange between the two countries. Key connections include the Bratislava (Slovakia) – Hranice (Czech Republic) interconnection, which plays a central role in enabling electricity flows between the two nations. The countries do not have an interconnected network for heat exchange.
	Congestion Management	

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Categories	Indicators	Description
		Czech Republic and Slovakia actively collaborate on congestion management to ensure the reliability and stability of their interconnected power grids and the entire European electricity grid. They use coordinated measures, such as market mechanisms and real-time grid management and dispatching tools, to manage grid imbalances according to EU guidelines to promote efficient cross-border electricity trade and grid security and reliability. Aligning tariffs, grid fees, and regulations will ensure fair access for decentralized energy producers. Leveraging EU funding programmes and coordinating through ENTSO-E will be essential to strengthening cross-border electricity exchange and supporting a resilient and efficient energy network.

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Denmark-Germany

Categories	Indicators	Description
Cross-border Energy Communities	Legal framework for cross-border energy communities	CBECs between Denmark and Germany face some regulatory challenges due to differing approaches in their respective legislations. The regulatory landscape can be summarized as follows. In Denmark, the Danish Electricity Supply Act n. 984 of 2021 and the Renewable Energy Act n.1791 of 2021 define CECs but do not specifically address provisions for CECs to be open to cross-border participation. ECs are granted access to all electricity markets, either directly or via third parties, but must be established as electricity trading or aggregator companies to participate directly. RECs are subject to a proximity boundary based on geographic location. The lack of specific provisions for CBECs in Denmark creates uncertainty regarding their cross-border operational framework. Furthermore, the proximity requirement for RECs may limit cross-border potential. In Germany, the Renewable Energy Act 2023 restricts energy community membership to residents registered in Germany, effectively excluding non-German participants, even those living near the border. The German restrictive approach directly hinders cross-border participation. Moreover, Germany additionally lacks a legal framework for energy sharing and faces challenges with grid connections in multi-unit buildings. The absence of clear guidelines, particularly for energy sharing in Germany, further complicates the establishment of CBECs.
	Private/Public financing instruments	Despite these challenges, there are potential avenues for cross-border cooperation in the energy sector. Interreg VI A South Baltic Programme 2021-2027 (covering parts of Germany and Denmark) invites initiatives to cooperate in the field of green energy (e.g. on solutions in production and utilisation of energy from renewable sources, common standards in renewable energy, joint green policy strategies, exchange and transfer knowledge and best practices). The Interreg VI-A Germany-Denmark Programme 2021-2027 offers support for cross-border projects. The Programme's comprehensive support for project development, including

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Categories	Indicators	Description
	Partnerships available	consulting and partner search assistance, creates a good environment for developing innovative sustainable energy initiatives. The Programme supports under its Specific Objective 2.1 the development and establishment of intelligent energy systems, networks and storage systems in order to ensure a stable energy supply in the programme's area in the future. The Interreg German-Denmark Programme area has already developed a pioneering role in the field of renewable energies. There is a common interest in promoting renewable energies. It is expected that actors involved gain detailed insights into how local and regional energy systems can be set up, not least in a cross-border region, and how the expansion of renewable energies can be successful, taking into account regional planning requirements and difficulties in gaining acceptance among the population. In order to develop measures relevant to the programme area, the focus is on solutions for medium-sized and smaller towns and sparsely populated rural areas with regard to technologies such as district heating, biogas/biomass, photovoltaics and wind power in a cross-border energy system. In order to arrive at effective solutions, test and demonstration plants (e.g. cross-border virtual power plants) can be funded under the 2021-2027 Programme. Already the Interreg V A Germany-Denmark programme (2014-2020 programming period) supported several energy-related cooperation projects dealing with innovative energy technologies or grid management. One example was the project 'Danish German Storage of Renewable Energy' or short DG STORE, showcasing various electricity flexibility and storage solutions. The project analysed how a future energy system in the region will be developed and how local storage and flexibility solutions can play a key role in solving the increasing bottlenecks in the transmission grid and lessen the need for downregulation through the storage and demand side management potentials. Another example is the CROSSWIND network supported in 2014-2020 which established a strong cross-border collaboration for stakeholders in the sector of small wind turbines. In addition, Interreg B programmes (for example, Interreg North Sea with its 2021-2027 project COPPER to prepare local authorities for their new

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Categories	Indicators	Description
		role coordinating local energy systems) and Interreg Europe (for example, like the 2021-2027 project REC4EU – Renewable Energy Communities for EU regions) can also be used to positively influence framework conditions for cross-border energy initiatives. Moreover, in the 2021–2027 period, the Connecting Europe Facility (CEF) Energy programme introduced a new category of projects: cross-border projects in the field of renewable energy. This addition is designed to enhance cross-border collaboration, recognizing the importance of regional cooperation in accelerating the deployment of renewable energy. The CEF Energy complements other EU funding Programmes for renewables by specifically targeting initiatives that bridge national efforts, creating synergies that optimize resource use and infrastructure.
Energy Communities	Transposition for energy communities and support measures	Danish legislation supports some basic rights of RECs and CECs, such as electricity sharing initiatives, but lacks a comprehensive enabling framework. Recent changes favour grid monopoly rights and eliminate operational support for RECs, including the abolition of local citizen ownership requirements for new wind projects. A grant scheme for community energy projects is in place, managed by the Danish Energy Agency.
		Germany has integrated the REC concept into its existing framework by amending the definition of "citizen energy company" under the Renewable Energy Act 2022, with support managed by the National Energy Regulator. Recent improvements to the renewables support scheme address past shortcomings but still lack a comprehensive enabling and regulatory framework to facilitate energy sharing among RECs. In German law, there is no direct equivalent to the concept of a 'citizen energy community' as defined in the Internal Electricity Market Directive.
General and Electricity Network	Organisation of the national electricity network	Interconnection levels of the national electricity networks are very good. The national power grids of Denmark and Germany are organized to ensure stability and efficiency in power transmission and distribution. Both countries have integrated transmission systems operated by their respective TSOs to facilitate the safe and adequate cross-border flow of electricity. Harmonization of grid

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Categories	Indicators	Description
	Electricity transfer and heat transfer	operations and regulatory practices are in line with EU and ENTSO-E regulations. Strong integration due to extensive renewable energy collaboration, particularly in wind energy. Well-developed cross-border transmission and market coupling mechanisms. The transfer of electricity between Denmark and Germany is facilitated by interconnected networks that enable electricity exchange according to European market rules. This interconnection facilitates the balancing of supply and demand, contributing to energy security and the integration of renewable energy. Denmark and Germany are well-connected through several high-voltage transmission lines. Key interconnections include the 600 MW interconnection between Denmark's Jutland (Tjele) and Germany's Schleswig-Holstein (Wilster) and the 400 kV lines between Denmark's East and Germany's Northern regions. These connections enable reliable electricity flow between the two countries and are critical for electricity trading and grid stability. Interconnectors such as the Kriegers Flak Combined Grid Solution interconnector (the first offshore interconnector in the Baltic Sea by linking the two national offshore wind farm connections) help enhance the interconnection and allow both countries to exchange renewable energy more efficiently. These upgrades are supported by EU funding programmes such as the Connecting Europe Facility (CEF). The countries do not have an interconnected network for heat exchange, with the exception of some local cross-border connection.
	Congestion Management	Additionally, both countries are involved in the North Sea Wind Power Hub initiative, aiming to develop a large-scale offshore wind power network and further integrate renewable energy into the grid. Denmark and Germany actively collaborate on congestion management to ensure the reliability and stability of their interconnected power grids and the entire European electricity grid. They use coordinated measures, such as market mechanisms and real-time grid management and dispatching tools, to manage grid imbalances according to EU guidelines to promote efficient cross-border electricity trade and grid security and reliability. Aligning tariffs, grid fees, and regulations will ensure fair access for decentralized energy

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Categories	Indicators	Description
		producers. Leveraging EU funding programmes and coordinating through ENTSO-E will be essential to strengthening cross-border electricity exchange and supporting a resilient and efficient energy network.

Estonia-Latvia

Categories	Indicators	Description
Cross-border Energy Communities	Legal framework for cross-border energy communities	CBECs between Estonia and Latvia face some regulatory challenges due to the lack of specific provisions in the legislation of both countries. In Estonia, the Electricity Market Act of 11 February 2003 and the Energy Sector Organisation Act of 16 June 2016 (amended by the Act of 4 May 2022) do not include references to CBECs and do not provide provisions for RECs and CECs to be open to cross-border participation. For RECs, there is no constraint for close proximity specified, and they can access all suitable energy markets either directly or through aggregation. In Latvia, the Amendments to the Energy Law and to the Electricity Market Law do not delineate CBECs and provisions for RECs and CECs to be open to cross-border participation. This regulatory landscape presents several challenges to establishing formal CBECs. First, both countries lack specific provisions for CBECs, creating uncertainty regarding their legal status and operational framework. Second, the absence of clear regulations for cross-border participation in energy communities hinders potential collaborative efforts.
	Private/Public financing instruments	There are several opportunities to fund and support CBECs and related cross-border cooperation activities: The Interreg VI A Estonia-Latvia Programme 2021-2027 supports cross-border initiatives. Its focus on improving conditions for cooperation and regional partnerships might benefit also energy-related initiatives, though it is not specifically tailored to energy communities. In addition, the Interreg VI A Programme Central Baltic 2021-2027 offers opportunities for an improved institutional cooperation across borders. In addition, Interreg B programmes (for example, Interreg Baltic Sea with its 2021-2027 project Energy Equilibrium helping local authorities to identify optimal renewable energy strategies, to exploit of local renewable energy potential through storage solutions and to simulate energy development scenarios for low-carbon systems)

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Categories	Indicators	Description
	Partnerships available	and Interreg Europe (for example, the 2021-2027 project REC4EU – Renewable Energy Communities for EU regions) can also be used to positively influence framework conditions for cross-border energy initiatives. Moreover, in the 2021–2027 period, the Connecting Europe Facility (CEF) Energy programme introduced a new category of projects: cross-border projects in the field of renewable energy. This addition is designed to enhance cross-border collaboration, recognizing the importance of regional cooperation in accelerating the deployment of renewable energy. The CEF Energy complements other EU funding Programmes for renewables by specifically targeting initiatives that bridge national efforts, creating synergies that optimize resource use and infrastructure. The positive framework for cooperation on energy can be observed also from other cross-border energy projects, such as the Estonia-Latvia third electricity interconnection, which received EUR 112 million from the Connecting Europe Facility as an EU Project of Common Interest, operating since January 2021. By increasing the capacity by approximately 600 MW at the border between Estonia and Latvia, the project allows energy transfer, facilitating the potential integration of renewable energy sources into the grid. The new lines (the interconnection comprises the Harku-Sindi and Kilingi-Nõmme-Riga lines) also provide a reliable corridor for the electricity market and significantly improve the security of supply in the Baltic states.

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Categories	Indicators	Description
Energy Communities	Transposition for energy communities and support measures	Both Estonia and Latvia still lack comprehensive frameworks and support measures for energy communities. In Estonia, the legislation includes two definitions with minimal elaboration on the criteria from the IMED Directive, particularly regarding effective control. There is no mention of an enabling framework for energy communities, nor are there specific measures for RECs within Estonia's renewable support scheme. In 2021, the Ministry of Economics of Latvia introduced the concept of energy communities into the national legislation. This will be followed by detailed guidelines or regulations in the near future. Latvia has introduced two definitions: a general definition of energy communities and specific references to RECs and "electricity communities" (elektroenerģijas kopiena). The proximity criterion and enabling framework will be detailed in future legislation under the Law on Energy. As the concept is new, a complete enabling framework and specific measures for RECs in the support scheme are not yet established.
General and Electricity Network	Organisation of the national electricity network	Interconnection levels of the national electricity networks are good. The national power grids of Estonia and Latvia are organized to ensure stability and efficiency in power transmission and distribution. Both countries have integrated transmission systems operated by their respective TSOs to facilitate the safe and adequate cross-border flow of electricity. Harmonization of grid operations and regulatory practices are in line with EU and ENTSO-E regulations. Integrated as part of the Baltic electricity market but still awaiting full synchronization with the EU system. The transfer of electricity between Estonia and Latvia is facilitated by interconnected networks that enable electricity exchange according to European market rules. This interconnection facilitates the balancing of supply and demand, contributing to energy security and the integration of renewable energy. Estonia and Latvia are interconnected through high-voltage transmission lines, including the 330 kV interconnection between the Estonian transmission network and the Latvian transmission system. This connection allows for the efficient exchange of electricity, contributing to the stability and security of both countries' electricity systems. The interconnection between Estonia and Latvia is
	Electricity transfer and heat transfer	
	Congestion Management	

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Categories	Indicators	Description
		part of the larger Baltic power grid network, which also connects Lithuania and other regional markets, creating a robust framework for regional electricity trading. Both Estonia and Latvia have been investing in the modernization and expansion of their electricity grid infrastructure to increase interconnection capacity, improve grid resilience, and facilitate more efficient electricity trading. For example, Elering in Estonia has been involved in the development of the Estlink interconnection, which links Estonia to Finland, and this complements the connection to Latvia as part of the wider regional infrastructure. The countries do not have an interconnected network for heat exchange. Estonia and Latvia actively collaborate on congestion management to ensure the reliability and stability of their interconnected power grids and the entire European electricity grid. They use coordinated measures, such as market mechanisms and real-time grid management and dispatching tools, to manage grid imbalances according to EU guidelines to promote efficient cross-border electricity trade and grid security and reliability. Aligning tariffs, grid fees, and regulations will ensure fair access for decentralized energy producers. Leveraging EU funding programmes and coordinating through ENTSO-E will be essential to strengthening cross-border electricity exchange and supporting a resilient and efficient energy network.

Finland-Sweden

Categories	Indicators	Description
Cross-border Energy Communities	Legal framework for cross-border energy communities	CBECs between Finland and Sweden face significant regulatory challenges due to limited or non-existent legislation in both countries. The regulatory landscape can be summarized as follows. In Finland, there is no specific mention of CBECs in Finnish legislation and the latter does not include provisions for RECs and CECs to be open to cross-border participation. For Local Energy Communities, the geographical scope is limited according to Decree 767/2021. In Sweden, ECs have not yet been implemented according to the definitions of CECs and RECs. This regulatory landscape presents substantial obstacles to establishing formal CBECs. In Finland, the lack of specific provisions for CBECs and the limited geographical scope for Local Energy Communities create barriers to cross-border participation. In Sweden, the absence of implemented energy community definitions leaves a significant regulatory gap. Despite these challenges, there are potential avenues for cross-border cooperation in the energy sector: At cross-border level, the two countries have different options. The Interreg VI A AURORA Programme 2021-2027 fosters cross-border cooperation in the northern territories of Sweden, Finland and Norway. Among its objectives, the cooperation programme fosters institutional cooperation and cross-border partnerships and networks. Projects will contribute to strengthening local and regional cross-border governance

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Categories	Indicators	Description
	Private/Public financing instruments	administrative capacity, as well as mutual trust, while minimising border obstacles. Projects will be financed also in the field of energy, and can develop innovative sustainable solutions such as energy technology ,energy storage, hybrid solutions, smart grid, and/or focus on energy production. The Interreg VI A Programmes Central Baltic and South Baltic 2021-2027 offer opportunities for funding cross-border cooperation initiatives as well. Both programmes allocated funds to improve institutional cooperation across borders. More specifically, the Interreg VI A South Baltic Programme 2021-2027 offers cooperation opportunities in the field of green energy (e.g. on solutions in production and utilisation of energy from renewable sources, common standards in renewable energy, joint green policy strategies, exchange and transfer knowledge and best practices).
	Partnerships available	The Interreg B Northern Periphery and Arctic Programme 2021-2027 supports the development and transfer of sustainable renewable energy generation and energy efficiency solutions suitable for cold climates and remote communities. Projects shall facilitate the use of place-based energy surpluses and development of smart energy management concepts, potentially also in remote cross-border areas. In addition, other Interreg B programmes (for example, Interreg Baltic Sea with its 2021-2027 project Energy Equilibrium helping local authorities to identify optimal renewable energy strategies, to exploit of local renewable energy potential through storage solutions and to simulate energy development scenarios for low-carbon systems, or the 21-27 StartSun project dedicated to develop role models for further creation of energy communities in in the Baltic Sea Region) and Interreg Europe (for example, the 2021-2027 project REC4EU – Renewable Energy Communities for EU regions) can also be used to positively influence framework conditions for cross-border energy initiatives. Moreover, in the 2021–2027 period, the Connecting Europe Facility (CEF) Energy programme introduced a new category of projects: cross-border projects in the field of renewable energy. This addition is designed to enhance cross-border collaboration, recognizing the importance of

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Categories	Indicators	Description
		regional cooperation in accelerating the deployment of renewable energy. The CEF Energy complements other EU funding Programmes for renewables by specifically targeting initiatives that bridge national efforts, creating synergies that optimize resource use and infrastructure. In general, between the Nordic countries, there are many strong ties of collaboration. For example, in the field of energy Nordic Energy Research is the Nordic institution for joint energy research and research-based policy development, under the Nordic Council of Ministers. In 2021, the Nordic ministers agreed on a Nordic energy policy co-operation programme for the period 2022–2024. Another example is the EU Strategy for the Baltic Sea Region with concrete initiatives to collaborate also on the green energy transition.
Energy Communities	Transposition for energy communities and support measures	Overall, the national framework conditions for the establishment of energy communities are not favourable in either Finland or Sweden. Finland has adopted one definition for Local Energy Communities (LECs), allowing electricity sharing among community members through a virtual net metering framework. This definition aligns more closely with the CEC definition than the REC definition, leaving a gap with no provisions for an enabling framework for RECs. The only addressed area is electricity sharing via virtual net metering. Overall, the Finnish government has not put in place any meaningful steps towards building an enabling framework. Sweden proposed recommendations but until recently have not formally transposed provisions for energy communities. The country does not have any special policies or measures to promote energy communities or include them in renewables support schemes.

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Categories	Indicators	Description
General and Electricity Network	Organisation of the national electricity network	Interconnection levels of the national electricity networks are very good. The Nordic countries deregulated their power markets in the early 1990s and brought their individual markets together into a common Nordic market 'NordPool'. Overall, High level of cross-border trade and interconnection, particularly in hydropower and nuclear energy. The Nord Pool electricity market enhances market integration and flexibility. The national power grids of Finland and Sweden are organized to ensure stability and efficiency in power transmission and distribution. Both countries have integrated transmission systems operated by their respective TSOs) to facilitate the safe and adequate cross-border flow of electricity. Harmonization of grid operations and regulatory practices are in line with EU and ENTSO-E regulations.
	Electricity transfer and heat transfer	The transfer of electricity between Finland and Sweden is facilitated by interconnected networks that enable electricity exchange according to European market rules. This interconnection facilitates the balancing of supply and demand, contributing to energy security and the integration of renewable energy. Finland and Sweden are connected through several high-voltage transmission lines, including the 400 kV interconnection between Finland's transmission system (operated by Finland's transmission system operator (FTSO)) and Sweden's (operated by Swedish transmission system operator (Svenska kraftnät)). Notable interconnections include the Fenno-Skan interconnection (Fenno-Skan 1 and 2), which links Finland and Sweden with a combined capacity of approximately 1,000 MW. The countries do not have an interconnected network for heat exchange.
	Congestion Management	Finland and Sweden actively collaborate on congestion management to ensure the reliability and stability of their interconnected power grids and the entire European electricity grid. They use coordinated measures, such as market mechanisms and real-time grid management and dispatching tools, to manage grid imbalances according to EU guidelines to promote efficient cross-border electricity trade and grid security and reliability. Regional cooperation, especially through the Nordic-Baltic Energy Cooperation, aims to optimize

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Categories	Indicators	Description
		the energy systems in the region and enhance cross-border electricity exchanges, providing a more resilient and flexible energy infrastructure. Aligning tariffs, grid fees, and regulations will ensure fair access for decentralized energy producers. Leveraging EU funding programmes and coordinating through ENTSO-E will be essential to strengthening cross-border electricity exchange and supporting a resilient and efficient energy network.

France-Germany

Categories	Indicators	Description
Cross-border Energy Communities	Legal framework for cross-border energy communities	Establishing CBECs between France and Germany entails navigating a complex landscape with both opportunities and challenges. France adopted definitions in line with EU Directives but lacks concrete action and supportive measures. While France has taken some significant legislative steps to transposing RECs and CECs, in particular to operationalise the activity of energy sharing, this process has not yet extended concretely to most elements of the enabling framework that must be in place. The possibility for RECs and CECs to be open to cross-border participation was not included in the transposition of the EU Directives on RECs and CECs. Germany incorporated RECs into existing 'citizen energy company' definitions and made positive changes to support its schemes. However, both countries have significant gaps in their regulatory frameworks, particularly regarding the possibility for RECs and CECs to be open to cross-border participation. Indeed, in Germany the Renewable Energy Act 2023 restricts membership to German residents, excluding cross-border participation, while in France the Energy Code does not provide provisions for RECs and CECs engaging in cross-border collaboration. Hence, cross-border cooperation is underdeveloped in the legal frameworks of both countries.

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	Private/Public financing instruments	Within this general context, there are different cooperation frameworks and supporting initiatives that can foster CBECs or similar initiatives: First, the Interreg VI A Greater Region Programme 2021-2027 (France – Germany - Belgium - Luxembourg) and the Interreg VI A Upper Rhine Programme 2021-2027 (France-Germany-Switzerland). Both programmes offer support to cross-border initiatives in different fields and allow for the facilitation of cross-border collaboration on knowledge exchange and good practices, data exchange and citizen engagement. Although not addressed specifically to CBECs, the Upper Rhine programme offers funding opportunities for projects connected to smart energy systems (Priority A) outside the scope of TEN-E. In addition, Interreg B programmes and Interreg Europe (for example, the 2021-2027 project REC4EU – Renewable Energy Communities for EU regions) can also be used to positively influence framework conditions for cross-border energy initiatives.
	Partnerships available	Moreover, in the 2021–2027 period, the Connecting Europe Facility (CEF) Energy programme introduced a new category of projects: cross-border projects in the field of renewable energy. This addition is designed to enhance cross-border collaboration, recognizing the importance of regional cooperation in accelerating the deployment of renewable energy. The CEF Energy complements other EU funding Programmes for renewables by specifically targeting initiatives that bridge national efforts, creating synergies that optimize resource use and infrastructure. The cooperation at the French-German border is very well developed. This is confirmed by numerous cooperation initiatives and institutionalised networks and partnerships, as well as cross-border public services. Examples of cross-border cooperation frameworks are the Upper Rhine Conference, local cross-border regional initiatives such as the EGTC Eurodistrict PAMINA, the Eurodistrikt Strasbourg-Ortenau or the Eurodistrikt – Region Freiburg / Centre et Sud Alsace. TRION-climate e.V. is a German-French-Swiss network of energy and climate actors in the Trinational Upper Rhine Metropolitan Region (TMO). The association was founded in 2015 as part of the Upper Rhine Conference by local

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		authorities. In 2023 the network had 104 members. At a more national level, there is also the Franco-German Energy Platform: a bilateral initiative focusing on energy cooperation between France and Germany. It aims at developing and launching projects in energy efficiency, grids, renewable energy, and mobility. It provides a framework for knowledge exchange and joint project development. The general positive context for cross-border energy initiatives is underlined by the development of concrete cases. The Cross-border heat transport company Calorie Kehl-Strasbourg (CKS) is a mixed economic company (Société d'économie mixte, SEM). It received EU funding from Interreg Upper Rhine Programme (both in the 2014-2020 and 2021-2027 periods) for the development of a cross-border heat network. The Zusamme Solar Colmar! project is a partnership between FESA Energie Geno (German) and Energie Partagée Alsace (French), both citizen-led energy cooperatives. This project closely aligns with the principles of cross-border energy communities and can serve as a model for future CBEC developments. It can be considered a Quasi-CBEC, since it entails financial cooperation and knowledge and human resources sharing for the installation of solar PVs in France, but it does not include exchanges of energy across borders.
Energy Communities	Transposition for energy communities and support measures	France and Germany have both transposed the relevant EU directives into their national legislation, but some gaps and challenges were identified. At the moment, France lacks concrete action and supportive measures to support the established framework, for instance. France has transposed from the Directives both RECs and CECs. The definitions emphasize autonomy based on company law, with upcoming regulations detailing control and geographical proximity. A key difference is eligibility: RECs have strict company restrictions, while CECs allow unrestricted participation, posing a risk of market actor dominance. The definitions largely mirror EU

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Categories	Indicators	Description
		directives, but the lack of regulatory monitoring could lead to misuse and trust issues. In Germany, the REC definition was incorporated by amending the existing 'citizen energy company' definition, effectively integrating elements from the REDII Directive. Support for Citizen Energy Communities under the Renewable Energy Act 2022 is managed by the National Energy Regulator. Overall, significant changes to the renewables support scheme for citizen energy companies are positive and go a long way towards rectifying the framework in the EEG after 2016. However, gaps are observed, particularly around building out an enabling framework generally, along with a regulatory framework that allows for RECs to share energy. In German law, there is no direct equivalent to the concept of a 'citizen energy community' as defined in the Internal Electricity Market Directive.
General and Electricity Network	Organisation of the national electricity network	Interconnection levels of the national electricity networks are very good.
	Electricity transfer and heat transfer	The national power grids of France and Germany are organized to ensure stability and efficiency in power transmission and distribution. Both countries have integrated transmission systems operated by their respective transmission system operators (TSOs) to facilitate the safe and adequately cross-border flow of electricity. Harmonization of grid operations and regulatory practices are in line with EU and ENTSO-E regulations. Overall, France and Germany have one of the most interconnected electricity networks in Europe, with multiple high-voltage interconnections and significant cross-border energy trade. Their networks support extensive cross-border energy flows, facilitating renewable integration and energy communities.
	Congestion Management	The transfer of electricity between France and Germany is facilitated by interconnected networks that enable electricity exchange according to European market rules. This interconnection facilitates the balancing of supply and demand, contributing to energy security and the integration of renewable energy and the exports of nuclear energy from France. France and Germany are interconnected through multiple high-voltage transmission lines, including the 2,000 MW HVDC interconnections (High Voltage Direct Current) and AC interconnections that allow the efficient exchange of electricity. Notable interconnections include the Rhin-Rhône and Saarbrücken-

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Categories	Indicators	Description
		Merlebach lines, which facilitate electricity trade between the two countries. The two countries do not have an interconnected network for heat exchange. Both France and Germany have invested heavily in improving their transmission networks and interconnections. For example, the SuedLink project, which connects Germany's northern renewable-rich regions to the southern industrial regions, is essential for ensuring that renewable electricity can be transported effectively across the country. Upgrades to France's transmission infrastructure, such as new HVDC interconnections, enhance the capacity for cross-border electricity exchange. Additionally, both countries are actively involved in regional initiatives aimed at improving grid infrastructure, such as TEN-E (Trans-European Networks for Energy), which supports projects to upgrade cross-border electricity transmission and increase grid capacity. France and Germany actively collaborate on congestion management to ensure the reliability and stability of their interconnected power grids and the entire European electricity grid. They use coordinated measures, such as market mechanisms and real-time grid management and dispatching tools, to manage grid imbalances according to EU guidelines to promote efficient cross-border electricity trade and grid security and reliability. Aligning tariffs, grid fees, and regulations will ensure fair access for decentralized energy producers. Leveraging EU funding programmes and coordinating through ENTSO-E will be essential to strengthening cross-border electricity exchange and supporting a resilient and efficient energy network.

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France-Italy

Categories	Indicators	Description
Cross-border Energy Communities	Legal framework for cross-border energy communities	Italy has not yet created favourable conditions to facilitate CBECs with its neighbouring country France. The possibility for RECs and CECs to be open to cross-border participation was not included in the transposition of the EU Directives on RECs and CECs. Similarly, the absence of consideration for cross-border participation of RECs and CECs provisions in the French Energy Code indicates a gap in the legal context for cross-border energy cooperation. The expanding potential for cross-border energy collaboration between France and Italy currently focuses on financial participation through innovative funding mechanisms. Building upon this foundation, there are opportunities to enhance renewable energy partnerships.
	Private/Public financing instruments	A good framework for creating new partnerships and initiatives is the Interreg VI A cooperation Programme between Italy and France, namely France-Italy (ALCOTRA) Programme 2021-2027 . These Programmes, while not specifically tailored to energy communities, support institutional and people-to-people cross-border cooperation, networks and thematic partnerships, trust-building and stakeholder engagement. They could provide a framework and funding for cross-border initiatives that might indirectly support energy-related collaborations. In particular, the Interreg VI A ALCOTRA Programme 2021-2027 offers funding opportunities to strengthen cooperation in the renewable energy and green hydrogen sectors; to promote technologies and best practices relating to renewable energy (production, storage, redistribution), particularly green hydrogen, as well as autonomous and off-grid energy systems and micro-networks; experimentation of action plans, pilot and demonstration projects, and studies on the use of green hydrogen (e.g. pilot projects for hydrogen snow groomers or snowploughs in ski resorts, and refuelling stations).
	Partnerships available	In addition, Interreg B programmes such as Interreg Alpine Space 2021-2027 (e.g. with a project called ALPHA , designing pathways for decarbonising the Alpine heating, cooling, and building sectors and creating enabling policy and financing frameworks in the Alpine macro-region or the project DIVERSE , setting the scene for the

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Categories	Indicators	Description
		implementation of bioenergy pathways), as well as Interreg Europe (for example, the 2021-2027 project REC4EU – Renewable Energy Communities for EU regions) can also be used to positively influence framework conditions for cross-border energy initiatives. Moreover, in the 2021–2027 period, the Connecting Europe Facility (CEF) Energy programme introduced a new category of projects: cross-border projects in the field of renewable energy. This addition is designed to enhance cross-border collaboration, recognizing the importance of regional cooperation in accelerating the deployment of renewable energy. The CEF Energy complements other EU funding Programmes for renewables by specifically targeting initiatives that bridge national efforts, creating synergies that optimize resource use and infrastructure. Furthermore, favourable frameworks for cross-border cooperation and starting points for CBEC initiatives can be regional and local cooperation structures such as the EGTC Alpi Maritime-Mercantour in the Maritime Alps region.
Energy Communities	Transposition for energy communities and support measures	France lacks concrete action and supportive measures to support the established framework, for instance. France has transposed from the Directives both RECs and CECs. The definitions emphasize autonomy based on company law, with upcoming regulations detailing control and geographical proximity. A key difference is eligibility: RECs have strict company restrictions, while CECs allow unrestricted participation, posing a risk of market actor dominance. The definitions largely mirror EU directives, but the lack of regulatory monitoring could lead to misuse and trust issues. Italy has made progress in transposing the EU directives and introducing specific measures for renewable energy communities and transposed the definition of RECs and CECs in line with the relevant EU Directives REDII and IMED. Supporting schemes for RECs are in place in particular in the Italian Recovery and Resilience Plan, e.g. with creating a specific premium tariff incentivizing real time self-consumption, however not applicable in the case of CECs.

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Categories	Indicators	Description
General and Electricity Network	Organisation of the national electricity network	Interconnection levels of the national electricity networks are good. Overall, interconnection capacity between the two countries supports market integration and renewable energy trade. The national power grids of France and Italy are organized to ensure stability and efficiency in power transmission and distribution. Both countries have integrated transmission systems operated by their respective transmission system operators (TSOs) to facilitate the safe and adequately cross-border flow of electricity. Harmonization of grid operations and regulatory practices are in line with EU and ENTSO-E regulations.
	Electricity transfer and heat transfer	The transfer of electricity between France and Italy is facilitated by interconnected networks that enable electricity exchange according to European market rules. This interconnection facilitates the balancing of supply and demand, contributing to energy security and the integration of renewable energy and the exports of nuclear energy from France. France and Italy are interconnected through multiple high-voltage transmission lines, most notably the HVDC (High Voltage Direct Current) interconnections between the two countries, such as the Savoie-Piedmont and Gravelines-Ventimiglia lines. These interconnections enable efficient electricity trade and ensure that electricity flows between the two countries based on supply and demand. The countries do not have an interconnected network for heat exchange.
	Congestion Management	France and Italy actively collaborate on congestion management to ensure the reliability and stability of their interconnected power grids and the entire European electricity grid. They use coordinated measures, such as market mechanisms and real-time grid management and dispatching tools, to manage grid imbalances according to EU guidelines to promote efficient cross-border electricity trade and grid security and reliability. Aligning tariffs, grid fees, and regulations will ensure fair access for decentralized energy producers. Leveraging EU funding programs and coordinating through ENTSO-E will be essential to strengthening cross-border electricity exchange and supporting a resilient and efficient energy network.

France-Luxembourg

Categories	Indicators	Description
Cross-border Energy Communities	Legal framework for cross-border energy communities	The French Energy Code does not specifically address provisions for RECs and CECs to be open to cross-border participation. This lack of legal framework significantly limits cross-border energy cooperation. Currently, the only avenue for French participants to engage in renewable energy projects in other EU Member States is through financial participation, which restricts more comprehensive forms of collaboration. The situation in Luxembourg is similar to France in terms of lacking specific provisions for RECs and CECs to be open to cross-border participation. The Act on the Organisation of the Electricity Market in Luxembourg does not include a reference to cross-border activities on energy communities. Additionally, there are geographical restrictions for RECs: injection and off-take points must be within the same geographical area. These points must be downstream of high or medium voltage to low voltage electricity transformation stations operated by the Distribution System Operator (DSO). In general, in Luxembourg, the current energy community framework provides a strong foundation for local initiatives and presents opportunities for cross-border collaboration through policy innovation and regional partnerships.
	Private/Public financing instruments	There are Programmes available in the region to promote and fund cross-border cooperation initiatives, for example the Interreg VI A Grande Région Programme 2021-2027 that covers neighbouring border regions in France, Luxembourg, Germany, and Belgium. The Programme supports the improvement of cross-border cooperation and governance, and innovative solutions to specific border challenges. In this sense, it can also support activities relevant for CBECs and related initiatives. For example, in the 2014-2020 programming period, the Interreg V A Grande Region Programme funded the project Energiewaben dedicated to finding solutions for shutdowns of fluctuating renewable energies due to grid bottlenecks and the cross-border exchange of electricity from such plants ("green electricity"), which is of interest for future CBEC and quasi-CBEC.

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Categories	Indicators	Description
		In addition, Interreg B programmes as well as Interreg Europe (for example, the 2021-2027 project REC4EU – Renewable Energy Communities for EU regions) can also be used to positively influence framework conditions for cross-border energy initiatives. Moreover, in the 2021–2027 period, the Connecting Europe Facility (CEF) Energy programme introduced a new category of projects: cross-border projects in the field of renewable energy. This addition is designed to enhance cross-border collaboration, recognizing the importance of regional cooperation in accelerating the deployment of renewable energy. The CEF Energy complements other EU funding Programmes for renewables by specifically targeting initiatives that bridge national efforts, creating synergies that optimize resource use and infrastructure.
	Partnerships available	Furthermore, there are solid regional and local cross-border cooperation structures in the area that can offer guidance on how to cooperate across borders. These structures can also be a starting point for CBECs or Q-CBECs. One example is the EGTC Alzette Belval covering an area along the French-Luxembourg border, including several municipalities from both countries.
Energy Communities	Transposition for energy communities and support measures	France lacks concrete action and supportive measures to support the established framework, for instance. France has transposed from the Directives both RECs and CECs. The definitions emphasize autonomy based on company law, with upcoming regulations detailing control and geographical proximity. A key difference is eligibility: RECs have strict company restrictions, while CECs allow unrestricted participation, posing a risk of market actor dominance. The definitions largely mirror EU directives, but the lack of regulatory monitoring could lead to misuse and trust issues. Luxembourg has proposed the transposition of only the REC definition into national law but has omitted some EU criteria such as openness and autonomy. Additionally, the definition of geographical proximity is overly narrow and fails to consider the technical characteristics of different activities. However, the national agency Klima Agence provides information on energy communities, and it introduced temporary investment aid schemes.

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Categories	Indicators	Description
General and Electricity Network	Organisation of the national electricity network	Interconnection levels of the national electricity networks are good. The national power grids of France and Luxembourg are organized to ensure stability and efficiency in power transmission and distribution. Both countries have integrated transmission systems operated by their respective TSOs to facilitate the safe and adequate cross-border flow of electricity. Harmonization of grid operations and regulatory practices are in line with EU and ENTSO-E regulations. Overall, strong energy exchange due to Luxembourg's reliance on imports from France's nuclear power system.
	Electricity transfer and heat transfer	The transfer of electricity between France and Luxembourg is facilitated by interconnected networks that enable electricity exchange according to European market rules. This interconnection facilitates the balancing of supply and low demand of Luxembourg, contributing to energy security and the integration of renewable energy and the exports of nuclear energy from France. France and Luxembourg are interconnected through a high-voltage transmission line, primarily the HVAC (High Voltage Alternating Current) interconnections. This interconnection allows electricity to flow between the two countries, facilitating the exchange of electricity according to supply and demand conditions. The two countries do not have an interconnected network for heat exchange.
	Congestion Management	France and Luxembourg actively collaborate on congestion management to ensure the reliability and stability of their interconnected power grids and the entire European electricity grid. They use coordinated measures, such as market mechanisms and real-time grid management and dispatching tools, to manage grid imbalances according to EU guidelines to promote efficient cross-border electricity trade and grid security and reliability. Aligning tariffs, grid fees, and regulations will ensure fair access for decentralized energy producers. Leveraging EU funding programs and coordinating through ENTSO-E will be essential to strengthening cross-border electricity exchange and supporting a resilient and efficient energy network.

France-Spain

Categories	Indicators	Description
Cross-border Energy Communities	Legal Framework for cross-border energy communities	The French Energy Code does not include provisions for RECs and CECs to be open to cross-border participation. This lack of legal detail hinders setting-up CBECs and poses a challenge for close cross-border energy cooperation. One option for French participants to engage in renewable energy projects in other EU Member States is through financial participation, which represents an opportunity for cooperation but limits more comprehensive forms of collaboration. The Royal Decree 23/23 of June 2020 in Spain, which addresses aspects of renewable energy or energy communities, does not include provisions for RECs and CECs to be open to cross-border participation. The absence of specific provisions for cross-border energy communities in both French and Spanish legislation creates a significant barrier to establishing such initiatives between these neighbouring countries. Opportunities for cross-border energy cooperation are offered within the Interreg VI A Spain-France-Andorra (POCTEFA) Programme 2021-2027 covering the cross-border area between the three countries. The programme might support cross-border energy initiatives from different angles, e.g.

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Categories	Indicators	Description
	Private/Public financing instruments	innovation and research, natural preservation and green energy, or improving the institutional capacity of public authorities and achieving better governance and the resolution of border obstacles. The programme also supports specific local functional cross-border areas. In addition, Interreg B Programmes, such as Interreg SUDOE 2021-2027 Programme (Spain-Portugal-France), for example, with its project SharedH2, promoting and validating the use of renewable hydrogen as a flexible and distributed energy storage solution in local energy communities as an alternative for the empowerment of rural areas) as well as Interreg Europe (for example, the 2021-2027 project REC4EU – Renewable Energy Communities for EU regions) can also be used to positively influence framework conditions for cross-border energy initiatives. Moreover, in the 2021–2027 period, the Connecting Europe Facility (CEF) Energy programme introduced a new category of projects: cross-border projects in the field of renewable energy. This addition is designed to enhance cross-border collaboration, recognizing the importance of regional cooperation in accelerating the deployment of renewable energy. The CEF Energy complements other EU funding Programmes for renewables by specifically targeting initiatives that bridge national efforts, creating synergies that optimize resource use and infrastructure.
	Partnerships available	Other solid cross-border entities exist in this area, that might be helpful in the setting-up of cross-border energy initiatives or CBEC. One example is the Eurociudad Vasca Bayona San Sebastián. Moreover, the Pyrenees-Mediterranean Euro-region is a cross-border cooperation structure between the Spanish regions of Catalonia and the Balearic Islands, and French region of Occitanie. The Euroregion focuses on various cooperation fields, including innovation, sustainable development, and higher education. While not specifically created for energy purposes, this structure could potentially be used to develop cross-border energy initiatives. It might provide a platform for dialogue and policy coordination on energy issues between the involved regions.

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Categories	Indicators	Description
Energy Communities	Transposition for energy communities and support measures	France lacks concrete action and supportive measures to support the established framework, for instance. France has transposed from the Directives both RECs and CECs. The definitions emphasize autonomy based on company law, with upcoming regulations detailing control and geographical proximity. A key difference is eligibility: RECs have strict company restrictions, while CECs allow unrestricted participation, posing a risk of market actor dominance. The definitions largely mirror EU directives, but the lack of regulatory monitoring could lead to misuse and trust issues. Spain only adopted the definition for RECs. Measures for self-consumption and some support within the national scheme have been implemented, along with non-regulatory steps to begin establishing the enabling framework for RECs. The Spanish National Energy and Climate Plan (NECP) outlines several measures to promote energy communities. They are also highlighted in the national Recovery and Resilience Plan and the national Strategy España 2050, in the chapters on the Urban and Rural Agenda, and the Fair and Inclusive Energy Transition. The Spanish Energy Agency IDAE offers several lines of support for the development and setting-up of local Energy Communities in Spain, including financial support to local support offices and the funding of strategic projects to upscale energy communities.
General and Electricity Network	Organisation of the national electricity network	Interconnection levels of the national electricity networks are good. The national power grids of France and Spain are organized to ensure stability and efficiency in power transmission and distribution. Both countries have integrated transmission systems operated by their respective transmission system operators (TSOs) to facilitate the safe and adequately cross-border

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Categories	Indicators	Description
	Electricity transfer and heat transfer	flow of electricity. Harmonization of grid operations and regulatory practices are in line with EU and ENTSO-E regulations. Overall, ongoing improvements in interconnection capacity, including new projects to enhance grid resilience. The transfer of electricity between France and Spain is facilitated by interconnected networks that enable electricity exchange according to European market rules. This interconnection facilitates the balancing of supply and low demand of Luxembourg, contributing to energy security and the integration of high shares of renewable energy in Spain and the exports of nuclear energy from France. France and Spain are interconnected by several high-voltage transmission lines, most notably the HVDC (High Voltage Direct Current) lines that link the two countries. The main interconnection is the Biriadou interconnection located in the Basque region, which connects the French and Spanish grids. This interconnection allows for the exchange of electricity between the two countries and plays a crucial role in balancing electricity supply and demand. The countries do not have an interconnected network for heat exchange.
	Congestion Management	France and Spain actively collaborate on congestion management to ensure the reliability and stability of their interconnected power grids and the entire European electricity grid. They use coordinated measures, such as market mechanisms and real-time grid management and dispatching tools, to manage grid imbalances according to EU guidelines to promote efficient cross-border electricity trade and grid security and reliability. Aligning tariffs, grid fees, and regulations will ensure fair access for decentralized energy producers. Leveraging EU funding programs and coordinating through ENTSO-E will be essential to strengthening cross-border electricity exchange and supporting a resilient and efficient energy network.

Germany-Luxembourg

Categories	Indicators	Description
Cross-border Energy Communities	Legal framework for cross-border energy communities	Luxembourg's Act on the Organisation of the Electricity Market does not include the possibility for energy communities to be open to cross-border participation. Additionally, there are geographical restrictions for RECs: injection and off-take points must be within the same geographical area. These points must be downstream of high or medium voltage to low voltage electricity transformation stations operated by the Distribution System Operator (DSO). These restrictions effectively limit the scope of energy communities to local areas within Luxembourg, making cross-border initiatives challenging. The German Renewable Energy Act 2023 links membership to registration in the German registry, which is only possible for German residents. This restriction creates a significant barrier to cross-border participation in energy communities. Moreover, the different definitions for "Citizen Energy Company" in Germany and "Energy Community" in Luxembourg, coupled with the lack of provisions to be open to cross-border participation, make formalized cooperation between energy communities near the German-Luxembourg border rather complicated under current regulations.
	Private/Public financing instruments	As legal framework for cross-border cooperation, the Karlsruhe Intergovernmental Agreement (1996) between the two countries, provides specific instruments for legally formalizing cooperation: a) Establishment of a 'local grouping for cross-border cooperation' (GÖZ/GLCT) with its own legal personality based on public law; b) Participation in organizations with legal personality established in the neighbouring country; c) Conclusion of a cooperation agreement on the delegation and transfer of public service tasks. For GÖZ/GLCT, direct citizen membership is not possible. There are Programmes available in the region to promote and fund cross-border cooperation initiatives, for example the Interreg VI A Grande Région Programme 2021-2027 covering parts of France, Luxembourg, Germany, and Belgium. The Programme supports the improvement of cross-

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Categories	Indicators	Description
	Partnerships available	border cooperation and governance and innovative solutions to specific border challenges. In this sense, it can also support activities relevant for CBECs and related initiatives. For example, in the 2014-2020 programming period, the Interreg V A Grande Region Programme funded the project Energiewaben dedicated to finding solutions for shutdowns of fluctuating renewable energies due to grid bottlenecks and the cross-border exchange of electricity (“green electricity”), which is of interest for future CBEC and Q-CBEC. In addition, Interreg B programmes such as the Interreg North-West Europe Programme 2021-2027 with a priority focus on energy transition and relevant projects already in the past (e.g. the ECCO project dedicated to accelerate the growth of local Energy Community Co-Operatives of the 2014-2020 period which fed into to the ‘Energy Community Platform’), as well as Interreg Europe (for example, the 2021-2027 project REC4EU – Renewable Energy Communities for EU regions) can also be used to positively influence framework conditions for cross-border energy initiatives. Moreover, in the 2021–2027 period, the Connecting Europe Facility (CEF) Energy programme introduced a new category of projects: cross-border projects in the field of renewable energy. This addition is designed to enhance cross-border collaboration, recognizing the importance of regional cooperation in accelerating the deployment of renewable energy. The CEF Energy complements other EU funding Programmes for renewables by specifically targeting initiatives that bridge national efforts, creating synergies that optimize resource use and infrastructure. As an asset for further cross-border cooperation on energy, it can be noted that Creos Luxembourg S.A., the main electricity grid operator in Luxembourg, is partially owned by German energy company innogy SE. This shared ownership could potentially facilitate some level of cross-border cooperation in grid management and energy distribution. Furthermore, existing cooperation frameworks provide potential starting points for cross-border energy communities between the two countries. This is confirmed by initiatives such as the Ralingen and Rosport-Mompach “borderless energy region”, which aims to use local RES (sun, wind and water) on a cross-border basis.

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Categories	Indicators	Description
Energy Communities	Transposition for energy communities and support measures	In Germany, RECs definition was incorporated by amending the existing 'citizen energy company' definition, effectively integrating elements from the REDII Directive. Support for Renewable Energy Communities under the Renewable Energy Act 2022 is managed by the National Energy Regulator. Overall, significant changes to the renewables support scheme for citizen energy companies are positive and go a long way towards rectifying the unworkable framework in the EEG after 2016. However, significant gaps remain, particularly around building out an enabling framework generally, along with a regulatory framework that allows for RECs to share energy. In German law, there is no direct equivalent to the concept of a 'citizen energy community' as defined in the Internal Electricity Market Directive. Luxembourg has proposed the transposition of only the REC definition into national law, but has omitted some EU criteria such as openness and autonomy. Additionally, the definition of geographical proximity is overly narrow and fails to consider the technical characteristics of different activities. Luxembourg has not yet developed an explicit enabling framework or conducted an assessment of potential and barriers for RECs. However, the national agency Klima Agence provides information on energy communities, and it introduced temporary investment aid schemes to support renewable energy communities.
General and Electricity Network	Organisation of the national electricity network	Interconnection levels of the national electricity networks are very good. The national power grids of Germany and Luxembourg are organized to ensure stability and efficiency in power transmission and distribution. Both countries have

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Categories	Indicators	Description
	Electricity transfer and heat transfer	integrated transmission systems operated by their respective TSOs to facilitate the safe and adequate cross-border flow of electricity. Harmonization of grid operations and regulatory practices are in line with EU and ENTSO-E regulations. Overall, well-integrated networks, with Luxembourg benefiting from Germany's energy market and grid stability. The transfer of electricity between Germany and Luxembourg is facilitated by interconnected networks that enable electricity exchange according to European market rules. This interconnection facilitates the balancing of supply and low demand of Luxembourg, contributing to energy security and the integration of high shares of renewable energy in Germany. Germany and Luxembourg are interconnected by high-voltage transmission lines, allowing the exchange of electricity between the two countries. The main interconnection is the Luxembourg-Germany interconnection, which enables electricity to flow from Germany's grid to Luxembourg and vice versa. The transmission system operators of Germany (TenneT, Amprion, 50Hertz, and TransnetBW) and Luxembourg (Creos) work closely together to ensure grid stability and reliability. They coordinate the flow of electricity between the two countries and monitor real-time grid conditions to ensure smooth electricity exchange. In particular, TenneT and Creos collaborate through the Coordinated Auction Office for Cross-Border Electricity Exchanges (CAO), which ensures the efficient allocation of cross-border transmission capacity and the management of electricity flows, balancing supply and demand in real time. The countries do not have an interconnected network for heat exchange.
	Congestion Management	Germany and Luxembourg actively collaborate on congestion management to ensure the reliability and stability of their interconnected power grids and the entire European electricity grid. They use coordinated measures, such as market mechanisms and real-time grid management and dispatching tools, to manage grid imbalances according to EU guidelines to promote efficient cross-border electricity trade and grid security and reliability. Coordinating through ENTSO-E will be essential to strengthening electricity exchange and supporting a resilient and efficient energy network.

Germany-Netherlands

Categories	Indicators	Description
Cross-border Energy Communities	Legal framework for cross-border energy communities	The German Renewable Energy Act 2023 restricts membership to those registered in the German registry, which is only possible for German residents, while not including provisions for RECs and CECs to be open to cross-border participation. This creates a significant barrier to CBECs and cross-border participation. The Energy Act 2022 in the Netherlands only defines Renewable Energy Communities (RECs) but lacks a provision for their operationalisation across borders. There is also a lack of guaranteed or supervised cooperation mechanisms for cross-border initiatives. The Dutch 1998 Electricity Act does not permit decentralized and cross-border exchange of electricity through the distribution system. While the EU directive IMED allows CECs to operate distribution systems, the Draft Dutch Energy Act (DEA) does not permit this. Subsidy schemes for direct connections between German energy sources and the Dutch electricity grid cannot be applied in the neighbouring country.
	Private/Public financing instruments	There are several frameworks for cross-border cooperation worth to be mentioned: The Interreg VI A Germany Netherlands Programme 2021-2027 supports cross-border projects in different fields, according to its priorities. The Programme does not focus specifically on energy cooperation, but under its Priority 1 it can support projects that strengthen the innovation capacity of SMEs with a particular focus on innovations aimed at a low-carbon economy in order to contribute to the energy transition also on the basis of innovation. The Interreg VI A Euregio Maas-Rhine Programme 2021-2027 also offers opportunities for cross-border cooperation in the southern DE-NL border and covers also parts of Belgium. The Programme has a specific focus on the low-carbon development of the cross-border region and supports projects that promote cross-

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Categories	Indicators	Description
		border renewable energy solutions (SO 2.ii), the adaptation to climate change (SO 2.iv) and a circular economy in the energy sector (SO 2.vi). Both the aforementioned Interreg A Programmes also support the development of activities for a better cross-border governance including the removal of border barriers as well as joint administrative cooperation. In this context, they might also fund activities to support the creation of a favourable framework for CBECs and quasi-CBECs. In addition, Interreg B programmes such as the Interreg North-West Europe Programme 2021-2027 with a priority focus on energy transition and relevant projects already in the past (e.g. the ECCO project dedicated to accelerate the growth of local Energy Community Co-Operatives of the 2014-2020 period which fed into to the 'Energy Community Platform'), as well as Interreg Europe (for example, the 2021-2027 project REC4EU – Renewable Energy Communities for EU regions) can also be used to positively influence framework conditions for cross-border energy initiatives. Moreover, in the 2021–2027 period, the Connecting Europe Facility (CEF) Energy programme introduced a new category of projects: cross-border projects in the field of renewable energy. This addition is designed to enhance cross-border collaboration, recognizing the importance of regional cooperation in accelerating the deployment of renewable energy. The CEF Energy complements other EU funding Programmes for renewables by specifically targeting initiatives that bridge national efforts, creating synergies that optimize resource use and infrastructure.
	Partnerships available	Cross-border cooperation between Germany and The Netherlands is well-established and highly institutionalised by several eurorgions and local cooperation structures such as the four Euregios: Euregio D-NL in Gronau, Euregio Rheinmaas-nord, Euregio RheinWaal, and Euregio Maas-Rhein. Furthermore, there are numerous local networks such as Eurode Herzogenrath - Kerkrade Städteregion Aachen - Parkstadt Limburg, and the urban networks Enschede / HengeloMünster-Osnabrück, Arnheim-Nimwegen-KleveEmmerich, Maastricht-Aachen-HeerlenHasselt-Lüttich, and

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Categories	Indicators	Description
		Mönchengladbach -Krefeld Eindhoven-Roermond Venlo. Examples of already existing cross-border cooperation on energy include the SEREH project, funded by the Interreg V A Germany-The Netherlands Programme 2014-2020, which provided valuable insights into cross-border energy integration. The project aimed to leverage the complementary strengths and distinct energy profiles of the cities Haaren and Emmen. SEREH was a pioneering initiative in Europe, as it served as a pilot project to analyse the possibilities for cross-border cooperation for a regional energy market.
Energy Communities	Transposition for energy communities and support measures	In Germany, RECs have been incorporated into the 'citizen energy company' framework under the Renewable Energy Act 2022, with support managed by the National Energy Regulator. Overall, significant changes to the renewables support scheme for citizen energy companies are positive and go a long way towards rectifying the unworkable framework in the EEG after 2016. While significant improvements have addressed past challenges, gaps remain in enabling energy sharing and building a comprehensive regulatory framework. In German law, there is no direct equivalent to the concept of a 'citizen energy community' as defined in the Internal Electricity Market Directive. In the Netherlands, REC and CEC definitions were merged into a unified "energy community" concept, clarifying participation requirements. The Dutch Climate Agreement encourages 50% local ownership of renewable energy on land by 2030, but critical aspects, like energy sharing and DSO collaboration, lack detail or remain unaddressed.
General and Electricity Network	Organisation of the national electricity network	Interconnection levels of the national electricity networks are very good. The national power grids of Germany and Netherlands are organized to ensure stability and efficiency in power transmission and distribution. Both countries have integrated transmission systems operated by their respective transmission system operators (TSOs) to facilitate the safe and

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Categories	Indicators	Description
	Electricity transfer and heat transfer	adequate cross-border flow of electricity. Harmonization of grid operations and regulatory practices are in line with EU and ENTSO-E regulations. Overall, A well-developed cross-border electricity exchange with a significant role in European market coupling. The transfer of electricity between Germany and Netherlands is facilitated by interconnected networks that enable electricity exchange according to European market rules. This interconnection facilitates the balancing of supply and demand, contributing to energy security and the integration of high shares of renewable energy in Germany. Germany and the Netherlands are interconnected by high-voltage transmission lines that enable the exchange of electricity between the two countries. Key interconnections include the Germany-Netherlands Interconnection (Doetinchem-Kleve), which connects the two nations' grids and facilitates the flow of electricity. TenneT, the transmission system operator (TSO) in Germany, and TenneT Netherlands, the TSO in the Netherlands, work together to monitor electricity flows across the Germany-Netherlands interconnection. Both operators coordinate in real time to manage electricity transfers and ensure the reliability of the interconnected grid. The two countries do not have an interconnected network for heat exchange.
	Congestion Management	Germany and Netherlands actively collaborate on congestion management to ensure the reliability and stability of their interconnected power grids and the entire European electricity grid. They use coordinated measures, such as market mechanisms and real-time grid management and dispatching tools, to manage grid imbalances according to EU guidelines to promote efficient cross-border electricity trade and grid security and reliability. Aligning tariffs, grid fees, and regulations will ensure fair access for decentralized energy producers. Leveraging EU funding programs and coordinating through ENTSO-E will be essential to strengthening cross-border electricity exchange and supporting a resilient and efficient energy network.

Germany-Poland

Categories	Indicators	Description
Cross-border Energy Communities	Legal framework for cross-border energy communities	The German Renewable Energy Act 2023 restricts membership to those registered in the German registry, which is only possible for German residents, while not including provisions for RECs and CECs to be open to cross-border participation. This creates a significant barrier to CBECs and cross-border participation in energy communities. The Law on Energy amendment of 28 July 2023 in Poland introduces several restrictions that hinder cross-border energy communities. Regarding CECs: they can only operate within the area of a single distribution system operator; production must be connected to networks with a rated voltage level of no more than 110 kV; activities explicitly cannot include connections to other countries. With regard to RECs: they must be located in the area of operation of the same electricity distribution system operator. Energy Cooperatives are subject to the same restrictions as CECs and RECs and can only act in the area of three directly neighbouring municipalities. Moreover, they are excluded from operating in urban municipalities. Thus, the situation for CBECs between Germany and Poland faces significant challenges: - Incompatible National Legislations: both countries have implemented restrictions that effectively prevent cross-border participation in energy communities. Germany limits participation to its residents, while Poland explicitly prohibits CECs from including connections to other countries. - Geographical Restrictions: Polish legislation imposes strict geographical limitations on energy communities and cooperatives, making it nearly impossible to establish cross-border initiatives. However, there are positive structures, programmes and mechanisms that can promote cross-border cooperation on energy and CBECs.

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Categories	Indicators	Description
	Private/Public financing instruments	There are three relevant Interreg Programmes that support cross-border initiatives between Germany and Poland in 2021-2027. First, the Interreg VI A Poland-Germany/Saxony Programme 2021-2027 which supports projects to create a 'Better governance of cooperation'. Second, the Interreg VI A Poland-Germany/Brandenburg-Lubuskie Programme 2021-2027 that under its Priority 1 aims to expand existing and establishing new cross-border cooperation between universities, research institutions and companies, e.g. in the areas of renewable energies, energy efficiency and intelligent energy systems, hydrogen, low-carbon economy. Under Priority 4 it supports cross-border networking and cooperation in all relevant subject areas, including the exchange of experience and the transfer of good practice from other German-Polish and European border regions. Third, the Interreg VI A Germany/ Mecklenburg-Vorpommern/ Brandenburg-Poland Programme 2021-2027 that supports under Priority 4 projects that involve the development of cross-border strategies and action plans, particularly in the areas of cross-border spatial planning, in cooperation in the field of spatial observation, or that eliminate legal and administrative obstacles. In addition, Interreg B programmes such as the Interreg Central Europe Programme 2021-2027 (with its 2021-2027 project HERCULES-CE to enhance the energy transition in Central Europe with the support of renewable energy communities) or the Interreg Danube Programme 2021-2027 (with the 2021-2027 projects NRGCOM and DECA dedicated to accelerate RECs and CECs and create appropriate operational conditions for energy communities in the Danube region), as well as Interreg Europe (for example, the 2021-2027 project REC4EU – Renewable Energy Communities for EU regions) can also be used to positively influence framework conditions for cross-border energy initiatives. Moreover, in the 2021–2027 period, the Connecting Europe Facility (CEF) Energy programme introduced a new category of projects: cross-border projects in the field of renewable energy. This addition is designed to enhance cross-border collaboration, recognizing the importance of regional cooperation in accelerating the deployment of renewable energy. The CEF Energy

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Categories	Indicators	Description
	Partnerships available	complements other EU funding Programmes for renewables by specifically targeting initiatives that bridge national efforts, creating synergies that optimize resource use and infrastructure. Despite the unfavourable situation for cross-border energy communities, platforms such as the German-Polish Energy Platform (DPEP) offer wide support to energy community development in the border area. The platform drives the energy transition in Germany and Poland, finds solutions to the challenges of the energy transition, develops joint projects to achieve climate neutrality and implements them. The German-Polish Energy Platform regularly publishes guidelines, manuals and studies on energy communities, comparing existing concepts and highlighting best practice examples. Furthermore, also the German-Polish Spatial Planning Portal and the EGTC competence centre in the region might support further cross-border cooperation on CBECS. Other structures for cross-border cooperation are the four Euroregions that work at the regional level in the German-Polish area to promote its cross-border development: Euroregion POMERANIA, Euroregion PRO EUROPA VIADRINA, Euroregion Spree-Neiße-Bober and Euroregion Neisse-Nisa-Nysa. Additional frameworks for cross-border cooperation exist with the integrated metropolitan region of Szczecin (Stettin), the European twin cities in Guben/Gubin and the island Usedom with Ostseebad Heringsdorf and Stadt Świnoujście, as well as Görlitz/Zgorzelec and Frankfurt (Oder)/Śluby. In fact, these last two twin cities both developed cross-border energy projects around the creation of district heating pipelines and the exchange of heat between across the border.
Energy Communities	Transposition for energy communities and support measures	In Germany, RECs definition has been incorporated by amending the existing 'citizen energy company' definition, effectively integrating elements from the REDII Directive. Support for Renewable Energy Communities under the Renewable Energy Act 2022 is managed by the National Energy Regulator. Overall, significant changes to the renewables support scheme for citizen energy companies are positive and go a long way towards rectifying the unworkable framework in the EEG after 2016. However, significant gaps remain, particularly

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Categories	Indicators	Description
		around building out an enabling framework generally, along with a regulatory framework that allows for RECs to share energy. In German law, there is no direct equivalent to the concept of a 'citizen energy community' as defined in the Internal Electricity Market Directive. According to Polish legislation, RECs are introduced as a subset of CECs. The updated laws for CECs and RECs specify participation criteria, including decision-making and control mechanisms. The legislation also broadens the range of legal entities that can establish an energy community and clarifies permissible activities in the electricity, gas, and heating sectors. However, CECs are restricted to operating within a single distribution network area, significantly limiting their operational scope and ability to engage in diverse activities. Overall, the new legislation represents an improvement, as there was previously no legal framework for energy communities, though a comprehensive enabling framework is still absent.
General and Electricity Network	Organisation of the national electricity network	Interconnection levels of the national electricity networks are good. The national power grids of Germany and Poland are organized to ensure stability and efficiency in power transmission and distribution. Both countries have integrated transmission systems operated by their respective transmission system operators (TSOs) to facilitate the safe and adequate cross-border flow of electricity. Harmonization of grid operations and regulatory practices are in line with EU and ENTSO-E regulations.
	Electricity transfer and heat transfer	The transfer of electricity between Germany and Poland is facilitated by interconnected networks that enable electricity exchange according to European market rules. This interconnection facilitates the balancing of supply and demand, contributing to energy security and the integration of high shares of renewable energy in Germany. Key interconnections include lines like Krajnik (Poland)-Eckersdorf (Germany) and Szczecin (Poland)-Neubrandenburg (Germany), which allow for efficient cross-border electricity transfers and enhance the overall reliability of both countries' grids. The countries do not have generalised interconnected networks for heat exchange but work on specific local cross-border heating grids.

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Categories	Indicators	Description
	Congestion Management	Germany and Poland actively collaborate on congestion management to ensure the reliability and stability of their interconnected power grids and the entire European electricity grid. They use coordinated measures, such as market mechanisms and real-time grid management and dispatching tools, to manage grid imbalances according to EU guidelines to promote efficient cross-border electricity trade and grid security and reliability. Aligning tariffs, grid fees, and regulations will ensure fair access for decentralized energy producers. Leveraging EU funding programs and coordinating through ENTSO-E will be essential to strengthening cross-border electricity exchange and supporting a resilient and efficient energy network.

Hungary-Romania

Categories	Indicators	Description
Cross-border Energy Communities	Legal framework for cross-border energy communities	CBECS between Hungary and Romania face massive regulatory and legal challenges. Hungary's approach is explicitly restrictive, with the Electricity Act LXXXVI prohibiting energy communities from engaging in cross-border cooperation for activities governed by the Act. This creates a substantial barrier to the formation of CBECS with Hungarian participation. Romania's regulatory framework, on the other hand, shows more openness to cross-border energy initiatives, at least in principle. The Emergency Ordinance no. 143 of December 28, 2021, which defines Citizen Energy Communities (CECs), explicitly mentions the possibility of cross-border participation. However, this provision comes with important caveats. While cross-border participation is mentioned as a possibility, there are currently no specific support mechanisms in place to facilitate such arrangements. The Emergency Ordinance no. 163 of November 29, 2022, which defines Renewable Energy Communities (RECs), does not outline any provisions for cross-border operation.
	Private/Public financing instruments	Despite these challenges, or rather as a response to these regulatory challenges, there are important opportunities for cross-border cooperation in the energy sector through the Interreg VI A Romania-Hungary Programme 2021-2027, which supports within its Priority 1 explicitly cooperation projects in the field of renewable energies, contributing to build green and renewable energy communities in the region and promoting joint solutions to upscale and further promote renewable energy sources. Within Priority 3, the Programme supports the drafting of joint action plans, strategies or institutional agreements, cross-border studies and joint actions

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Categories	Indicators	Description
	Partnerships available	on how to tackle barriers to cooperation, as well as joint actions, events, and exchange of experience on cross-border strategic planning and project development. In addition, Interreg B programmes such as the Interreg Central Europe Programme 2021-2027 (with its 2021-2027 project HERCULES-CE to enhance the energy transition in Central Europe with the support of renewable energy communities) or the Interreg Danube Programme 2021-2027 (with the 2021-2027 projects NRGCOM and DECA dedicated to accelerate RECs and CECs and create appropriate operational conditions for energy communities in the Danube region), as well as Interreg Europe (for example, the 2021-2027 project REC4EU – Renewable Energy Communities for EU regions) can also be used to positively influence framework conditions for cross-border energy initiatives. Moreover, in the 2021–2027 period, the Connecting Europe Facility (CEF) Energy programme introduced a new category of projects: cross-border projects in the field of renewable energy. This addition is designed to enhance cross-border collaboration, recognizing the importance of regional cooperation in accelerating the deployment of renewable energy. The CEF Energy complements other EU funding Programmes for renewables by specifically targeting initiatives that bridge national efforts, creating synergies that optimize resource use and infrastructure. Additional structures for cross-border cooperation that might help to start cooperating also in the field of energy and CBECs or quasi-CBECs are the Debrecen-Oradea Eurometropolis as well as the EGTCs Banat-Triplex Confinium EGTC, Gate to Europe EGTC, the European Border Cities EGTC and the European Common Future Building EGTC, even if these EGTC usually do not focus on energy cooperation.

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Categories	Indicators	Description
Energy Communities	Transposition for energy communities and support measures	Hungary has struggled to combine both definitions into a coherent concept, currently REC defined as subset of CECs. Some criteria proposed by the EU Directives are still missing in national legislation, and, in more detail, the full transposition of the REDII Directive has not been achieved, notably excluding heating and cooling as eligible activities for RECs. So far, in Hungary, support schemes tend to prioritize for-profit companies, which may limit community involvement. The Romanian government adopted an Ordinance to transpose CECs into national legislation in 2021. For the most part, this legislation was directly replicating the CEC provisions from the IMED Directive. To transpose the REDII Directive, Romania passed an Emergency Ordinance in November 2022. For the most part, it takes the same approach as the transposition of CECs. The National Regulator, ANRE, take on much of the responsibility for the implementation of RECs and CECs at national level. While an enabling framework is seen as an outcome in national legislation, the details of the enabling framework, and support for RECs, must still emerge through concrete policies and measures.
General and Electricity Network	Organisation of the national electricity network	Interconnection levels of the national electricity networks are regular. The national power grids of Hungary and Romania are organized to ensure stability and efficiency in power transmission and distribution. Both countries have integrated transmission systems operated by their respective transmission system operators (TSOs) to facilitate the safe and adequately cross-border flow of electricity. Harmonization of grid operations and regulatory practices are in line with EU and ENTSO-E regulations. Overall, cross-border exchanges occur, but grid infrastructure remains underdeveloped. The transfer of electricity between Hungary and Romania is facilitated by interconnected networks that enable electricity exchange according to European market rules. This interconnection facilitates the balancing of supply and demand, contributing to energy security and the integration of renewable energy. Key interconnection points
	Electricity transfer and heat transfer	
	Congestion Management	

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Categories	Indicators	Description
		include the Arad (Romania)-Szeged (Hungary) and Cernavodă (Romania)-Paks (Hungary) lines. These interconnections enable both countries to balance. The countries do not have an interconnected network for heat exchange. Hungary and Romania actively collaborate on congestion management to ensure the reliability and stability of their interconnected power grids and the entire European electricity grid. They use coordinated measures, such as market mechanisms and real-time grid management and dispatching tools, to manage grid imbalances according to EU guidelines to promote efficient cross-border electricity trade and grid security and reliability. Aligning tariffs, grid fees, and regulations will ensure fair access for decentralized energy producers. Leveraging EU funding programmes and coordinating through ENTSO-E will be essential to strengthening cross-border electricity exchange and supporting a resilient and efficient energy network.

Hungary-Slovakia

Categories	Indicators	Description
Cross-border Energy Communities	Legal framework for cross-border energy communities	The Electricity Act LXXXVI in Hungary explicitly prohibits Energy Communities from engaging in cross-border cooperation. This creates a significant legal barrier to establishing Cross Border Energy Communities (CBEs) with neighbouring countries, including Slovakia. In Slovakia, the Act 256/2022 of 22 June 2022, which amended Act 251/2012 on Energy, does not mention CBEs. Similarly, the amendment 363/2022 of 19 October 2022 to the Act 309/2009 on Support for Renewable Energy Sources also lacks provisions for RECs and CECs to be open to cross-border participation. This absence of specific regulations for cross-border energy communities in Slovak law creates a legislative gap for such initiatives.
	Private/Public financing instruments	Opportunities for cross-border cooperation are offered by the Interreg VI-A Slovakia-Hungary Programme 2021-2027, which aims at enhancing cross-border cooperation between the two countries. While not specifically designed for energy projects, it can support cross-border energy cooperation via its Priority Axis 3 on institutional cooperation, promoting legal and administrative cooperation and cooperation between citizens, civil society actors and institutions, in particular with a view to resolving legal and other obstacles related to the border. In addition, Interreg B programmes such as the Interreg Central Europe Programme 2021-2027 (with its 2021-2027 project HERCULES-CE to enhance the energy transition in Central Europe with the support of renewable energy communities) or the Interreg Danube Programme 2021-2027 (with the 2021-2027 projects NRGCOM and DECA dedicated to accelerate RECs and CECs and create appropriate operational conditions for energy communities in the Danube region), as well as Interreg Europe (for example, the 2021-2027 project REC4EU – Renewable Energy Communities for EU regions) can also be used to positively influence framework conditions for cross-border energy initiatives.

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Categories	Indicators	Description
	Partnerships available	Moreover, in the 2021–2027 period, the Connecting Europe Facility (CEF) Energy programme introduced a new category of projects: cross-border projects in the field of renewable energy. This addition is designed to enhance cross-border collaboration, recognizing the importance of regional cooperation in accelerating the deployment of renewable energy. The CEF Energy complements other EU funding Programmes for renewables by specifically targeting initiatives that bridge national efforts, creating synergies that optimize resource use and infrastructure. Additional structures for cross-border cooperation that might help to start cooperating also in the field of energy and CBECs or quasi-CBECs are different EGTCs working on both sides of the border, e.g. the EGTC Arrabona, EGTC Via Carpatia, Sajó-Rima EGTC, Rába-Duna-Vág EGTC, Pontibus EGTC, Ipoly EGTC and the Ister-Granum Euroregion EGTC. This last one also promoted the rebuilding of the cross-border Mária Valéria Bridge in 2001. In this context the cross-border public bicycle sharing system “Maria Valéria Bike” was jointly created by the municipalities of Esztergom and Štúrovo, funded by the framework of the Interreg V-A Slovakia-Hungary Programme between 2017 and 2020. Within the framework of the project, 14 bicycle storage stations were set up of which six are located in Štúrovo and eight in Esztergom. The public bicycle sharing system includes 60 conventional and 45 electric bicycles. These cross-border structures can have a supporting role for developing cross-border initiatives, even if most of them do not usually work with energy issues.

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Categories	Indicators	Description
Energy Communities	Transposition for energy communities and support measures	Hungary has struggled to combine both definitions into a coherent concept, currently REC defined as subset of CECs. Some criteria proposed by the EU Directives are still missing in national legislation, and, in more detail, the full transposition of the REDII Directive has not been achieved so far, notably excluding heating and cooling as eligible activities for RECs. So far, in Hungary, support schemes tend to prioritize for-profit companies, which may limit community involvement. Slovakia, on the other hand, is still in the early stages, with two definitions of RECs and CECs that reflect largely the definition provided in the relevant EU Directives. The Program Slovensko was designed as a key national policy instrument and initiative to channel financial and technical support towards the development of energy communities. This program is seen as a vital tool in overcoming current barriers to the growth of ECs in Slovakia. However, there are still several obstacles such as insufficient legal support, the need for an effective billing system, and the lack of economic analysis of the benefits of ECs.
General and Electricity Network	Organisation of the national electricity network	Interconnection levels of the national electricity networks are regular. The national power grids of Hungary and Slovakia are organized to ensure stability and efficiency in power transmission and distribution. Both countries have integrated transmission systems operated by their respective transmission system operators (TSOs) to facilitate the safe and adequate cross-border flow of electricity. Harmonization of grid operations and regulatory practices are in line with EU and ENTSO-E regulations. Overall, moderate interconnection, with grid upgrades needed to support more cross-border flows.
	Electricity transfer and heat transfer	The transfer of electricity between Hungary and Slovakia is facilitated by interconnected networks that enable electricity exchange according to European market rules. This interconnection facilitates the balancing of supply and demand, contributing to energy security and the integration of renewable energy. Hungary and Slovakia are interconnected through high-voltage transmission lines, which enable reliable electricity exchanges between the two countries. One of the key interconnection points is the Gabčíkovo (Slovakia)-Paks (Hungary) line, which facilitates the flow of
	Congestion Management	

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Categories	Indicators	Description
		electricity across the border. The countries do not have an interconnected network for heat exchange. Hungary and Slovakia actively collaborate on congestion management to ensure the reliability and stability of their interconnected power grids and the entire European electricity grid. They use coordinated measures, such as market mechanisms and real-time grid management and dispatching tools, to manage grid imbalances according to EU guidelines to promote efficient cross-border electricity trade and grid security and reliability. Aligning tariffs, grid fees, and regulations will ensure fair access for decentralized energy producers. Leveraging EU funding programs and coordinating through ENTSO-E will be essential to strengthening cross-border electricity exchange and supporting a resilient and efficient energy network.

Hungary-Slovenia

Categories	Indicators	Description
Cross-border Energy Communities	Legal framework for cross-border energy communities	The Electricity Act LXXXVI in Hungary explicitly prohibits Energy Communities from engaging in cross-border cooperation. Specifically, Article 66/B (3) states that Energy Communities shall not engage in cross-border cooperation in relation to activities governed by this Act. This creates a significant legal barrier to establishing CBECs with neighbouring countries, including Slovenia. Slovenia's legal framework for energy communities lacks specific provisions for RECs and CECs to be open to cross-border participation: a) The Act on the promotion of renewable energy sources (ZSROVE) does not mention CBECs. b) The Act on Electricity Supply (ZOEE) also lacks a definition or provisions for CBECs. c) The Decree n. 4211 for electricity market operation describes responsibilities for Renewable Energy Communities (RECs) and Citizen Energy Communities (CECs) as market participants but does not address cross-border aspects. This absence of specific regulations for cross-border energy communities in Slovenian law creates a legislative gap for such initiatives.

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Categories	Indicators	Description
	Private/Public financing instruments	Opportunities for public funding are available through the cross-border cooperation Programme Interreg VI-A Slovenia-Hungary Programme 2021-2027, which aims at enhancing cross-border cooperation between the two countries. While not specifically designed for energy projects, it can support cross-border energy cooperation via its Priority Axis 3 on institutional cooperation, promoting legal and administrative cooperation and cooperation between citizens, civil society actors and institutions, in particular with a view to resolving legal and other obstacles related to the border. In addition, Interreg B programmes such as the Interreg Central Europe Programme 2021-2027 (with its 2021-2027 project HERCULES-CE to enhance the energy transition in Central Europe with the support of renewable energy communities) or the Interreg Danube Programme 2021-2027 (with the 2021-2027 projects NRGCOM and DECA dedicated to accelerate RECs and CECs and create appropriate operational conditions for energy communities in the Danube region), as well as Interreg Europe (for example, the 2021-2027 project REC4EU – Renewable Energy Communities for EU regions) can also be used to positively influence framework conditions for cross-border energy initiatives. Moreover, in the 2021–2027 period, the Connecting Europe Facility (CEF) Energy programme introduced a new category of projects: cross-border projects in the field of renewable energy. This addition is designed to enhance cross-border collaboration, recognizing the importance of regional cooperation in accelerating the

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Categories	Indicators	Description
	Partnerships available	deployment of renewable energy. The CEF Energy complements other EU funding Programmes for renewables by specifically targeting initiatives that bridge national efforts, creating synergies that optimize resource use and infrastructure. Additional cross-border cooperation structures that might help to kick-start energy cooperation activities and CBECs or quasi-CBECs are the Muraba EGTC and the Pannon EGTC. Even if they do not address energy itself, they might be a facilitator for cross-border activities and contacts for emerging CBEC initiatives.
Energy Communities	Transposition for energy communities and support measures	Hungary has struggled to combine both definitions into a coherent concept, currently REC defined as subset of CECs. Some criteria proposed by the EU Directives are still missing in national legislation, and, in more detail, the full transposition of the REDII Directive has not been achieved, notably excluding heating and cooling as eligible activities for RECs. So far, in Hungary, support schemes tend to prioritize for-profit companies, which may limit community involvement. Slovenia has made some progress, with the transposition of directives and plans for enabling measures and support schemes, although it is still a copy and paste from the EU Directives and concrete measures are still missing.
General and Electricity Network	Organisation of the national electricity network	Interconnection levels of the national electricity networks are regular. The national power grids of Hungary and Slovenia are organized to ensure stability and efficiency in power transmission and distribution. Both countries have integrated transmission systems operated by their respective transmission system operators (TSOs) to facilitate the safe and adequately cross-border flow of electricity. Harmonization of grid operations and regulatory practices are in line with EU and ENTSO-E regulations. Overall, some level of interconnection exists, but limited capacity prevents deeper integration. The transfer of electricity between Hungary and Slovenia is facilitated by interconnected networks that enable electricity exchange according to European market rules. This interconnection facilitates the balancing of supply and demand, contributing to energy security and the integration of renewable energy. Hungary and Slovenia are
	Electricity transfer and heat transfer	
	Congestion Management	

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Categories	Indicators	Description
		interconnected via high-voltage transmission lines, with key interconnection points including the Pecs (Hungary)-Cirkovce (Slovenia) line. This interconnection facilitates the exchange of electricity between the two countries and contributes to balancing supply and demand. The countries do not have an interconnected network for heat exchange. Hungary and Slovenia actively collaborate on congestion management to ensure the reliability and stability of their interconnected power grids and the entire European electricity grid. They use coordinated measures, such as market mechanisms and real-time grid management and dispatching tools, to manage grid imbalances according to EU guidelines to promote efficient cross-border electricity trade and grid security and reliability. Aligning tariffs, grid fees, and regulations will ensure fair access for decentralized energy producers. Leveraging EU funding programs and coordinating through ENTSO-E will be essential to strengthening cross-border electricity exchange and supporting a resilient and efficient energy network.

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Ireland

Categories	Indicators	Description
Cross-border Energy Communities	Legal framework for cross-border energy communities	According to the Decision Paper of the Commission for Regulation of Utilities (CRU) in Ireland, there is no mention of cross border participation in Energy Communities in the national regulations. RECs in Ireland have specific ownership and control requirements: • They should be owned and controlled by people resident in Ireland. • Businesses participating must be located in Ireland. • Membership of RECs is limited to those served by the Irish distribution network. At the moment, Ireland does not participate in any cross-border Interreg Programme with other EU Member States.
	Private/Public financing instruments	
Energy Communities	Transposition for energy communities	The Irish Government is currently in the process of transposing EU directive provisions on energy communities, with several gaps still to be addressed. Their initial step was creating a support scheme specifically tailored for RECs, particularly focusing on 'community-led' projects as defined by the scheme. These definitions also provide advantages for RECs seeking grid connections. The Department of Environment, Climate and Communications (DECC) has integrated specific support provisions for RECs within their Renewable Electricity Support Scheme (RESS), designed to bolster renewable energy production in Ireland. A portion of capacity auctions under RESS is reserved for qualifying community-led projects. DECC has additionally implemented supportive measures under RESS, including access to expertise, financial assistance for early works, and a streamlined process for grid connection applications outside the standard batch process. Moreover, the Sustainable Energy Authority of Ireland (SEAI) has been tasked with establishing an online information portal modelled after the CARES Scotland approach. This portal aims to serve as a centralized resource where RECs can access information on permitting, financing, and other technical and legal matters.
	Financial support measures	
General and Electricity Network	Organisation of the national electricity network	The national power grids of Ireland are organized to ensure stability and efficiency in power transmission and distribution. Harmonization of grid

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Categories	Indicators	Description
	Electricity transfer and heat transfer	operations and regulatory practices are in line with EU and ENTSO-E regulations.
	Congestion Management	The TSO uses coordinated measures, such as market mechanisms and real-time grid management and dispatching tools, to manage grid imbalances according to EU guidelines to promote efficient cross-border electricity trade and grid security and reliability. Aligning tariffs, grid fees, and regulations will ensure fair access for decentralized energy producers. Leveraging EU funding programs and coordinating through ENTSO-E will be essential to strengthening cross-border electricity exchange and supporting a resilient and efficient energy network.

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Italy-Slovenia

Categories	Indicators	Description
Cross-border Energy Communities	Legal framework for cross-border energy communities	The Italian Decree published in January 2024 does not mention or provide provisions for RECs and CECs to be open to cross-border participation. This lack of specific provisions creates a regulatory gap for Cross Border Energy Communities (CBEs) involving Italy. In Slovenia, the legal framework for energy communities also lacks specific provisions for cross-border cooperation: the Act on the promotion of renewable energy sources (ZSROVE) does not mention CBEs. The Act on Electricity Supply (ZOE) also lacks a definition or provisions for RECs and CECs to be open to cross-border participation. The Decree n. 4211 for electricity market operation describes responsibilities for Renewable Energy Communities (RECs) and Citizen Energy Communities (CECs) as market participants but does not address cross-border aspects.
	Private/Public financing instruments	Opportunities for public funding are available through the Interreg VI-A Italy-Slovenia Programme 2021-2027, that aims at enhancing cross-border cooperation between the two countries in different fields. Relevant can be especially the Priority on better cooperation governance, promoting legal and administrative cooperation and cooperation between citizens, civil society actors and institutions, in particular, with a view to resolving legal and other obstacles in border regions. In addition, Interreg B programmes such as the Interreg Central Europe Programme 2021-2027 (with its 2021-2027 project HERCULES-CE to enhance the energy transition in Central Europe with the support of renewable energy communities) or the Interreg IPA ADRION Programme 2021-2027, as well as Interreg Europe (for example, the 2021-2027 project REC4EU – Renewable Energy

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Categories	Indicators	Description
	Partnerships available	Communities for EU regions) can also be used to positively influence framework conditions for cross-border energy initiatives. Moreover, in the 2021–2027 period, the Connecting Europe Facility (CEF) Energy programme introduced a new category of projects: cross-border projects in the field of renewable energy. This addition is designed to enhance cross-border collaboration, recognizing the importance of regional cooperation in accelerating the deployment of renewable energy. The CEF Energy complements other EU funding Programmes for renewables by specifically targeting initiatives that bridge national efforts, creating synergies that optimize resource use and infrastructure. One example of another supportive cross-border cooperation structures is the EGTC GO which is a cross-border public authority with legal personality, founded in 2011 by the municipalities of Gorizia, Nova Gorica and Šempeter-Vrtojba. The EGTC GO, in cooperation with the two municipalities of Nova Gorica and Gorizia, collaboratively decided to improve and integrate the cross-border cycling infrastructure. In 2021, Nova Gorica (SI) introduced its EU co-funded bike-sharing system, GO2GO. Approximately half of the 89 bikes stationed at 20 locations are electric. In November 2022, the system was expanded across the border with the establishment of three GO2GO docking stations in Gorizia (IT).
Energy Communities	Transposition for energy communities and support measures	Italy has made progress in transposing directives and introducing specific measures for renewable energy communities. Two definitions were introduced for RECs and CECs, in line with the EU Directives. Supporting schemes for RECs are in place, e.g., National Recovery and Resilience Plan, with specific premium tariff incentivizing real time self-consumption, while not for CECs. Slovenia has made some progress, with the transposition of directives and plans for enabling measures and support schemes, although it is still a copy and paste from the EU Directives and concrete measures are still missing.

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Categories	Indicators	Description
General and Electricity Network	Organisation of the national electricity network	Interconnection levels of the national electricity networks are regular. Overall, well-developed cross-border exchange but faces grid congestion. The national power grids of Italy and Slovenia are organized to ensure stability and efficiency in power transmission and distribution. Both countries have integrated transmission systems operated by their respective TSOs to facilitate the safe and adequate cross-border flow of electricity. Harmonization of grid operations and regulatory practices are in line with EU and ENTSO-E regulations. The transfer of electricity between Italy and Slovenia is facilitated by interconnected networks that enable electricity exchange according to European market rules. This interconnection facilitates the balancing of supply and demand, contributing to energy security and the integration of renewable energy. Italy and Slovenia are connected via high-voltage transmission lines, with key interconnection points including the Suedtirol (Italy)-Krško (Slovenia) line. These interconnections allow for the efficient transfer of electricity between the two countries, ensuring balanced supply and demand across both systems. The countries do not have an interconnected network for heat exchange. Italy and Slovenia actively collaborate on congestion management to ensure the reliability and stability of their interconnected power grids and the entire European electricity grid. They use coordinated measures, such as market mechanisms and real-time grid management and dispatching tools, to manage grid imbalances according to EU guidelines to promote efficient cross-border electricity trade and grid security and reliability. Aligning tariffs, grid fees, and regulations will ensure fair access for decentralized energy producers. Leveraging EU funding programs and coordinating through ENTSO-E will be essential to strengthening cross-border electricity exchange and supporting a resilient and efficient energy network.
	Electricity transfer and heat transfer	
	Congestion Management	

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Latvia-Lithuania

Categories	Indicators	Description
Cross-border Energy Communities	Legal framework for cross-border energy communities	The amendments to the Energy Law and to the Electricity Market Law in Latvia to transpose the EU Directives on CECs (IMED) and RECs (REDII) do not include any notion of cross-border participation in energy communities. This lack of specific provisions creates a regulatory gap for cross-border energy community initiatives involving Latvia. The Lithuanian legal framework also lacks specific provisions for CBECs. However, it does have some regulations for energy communities: a) For RECs, at least 51% of the votes at the general meeting of shareholders must belong to natural persons. These shareholders must have their place of residence declared in the municipality where the energy production facility is planned or in bordering municipal elderships; b) For CECs, no specific geographical restrictions are mentioned. The absence of cross-border provisions and the geographical restrictions for RECs create potential barriers for cross-border initiatives between the two countries.
	Private/Public financing instruments	Opportunities for funding to start cross-border activities can be found in the Interreg VI-A Latvia-Lithuania Programme 2021-2027. The Programme is designed to strengthen cross-border cooperation between the two countries. Although not specifically focused on energy, it could potentially support cross-border activities or related studies that prepare the ground for cross-border energy cooperation or the promotion of energy communities. One of its four priorities targets capacity-building and people-to-people cooperation, which might be of interest for emerging cross-border energy initiatives, CBEC or Q-CBECs. In addition, other Interreg B programmes (for example, Interreg Baltic Sea with its 2021-2027 project Energy Equilibrium helping local authorities to identify optimal renewable energy strategies, to exploit of local renewable energy potential through storage solutions and to simulate energy development scenarios for low-carbon systems, or the 21-27 StartSun project dedicated to develop role models for further creation of energy communities in in the Baltic Sea Region) and

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Categories	Indicators	Description
		Interreg Europe (for example, the 2021-2027 project REC4EU – Renewable Energy Communities for EU regions) can also be used to positively influence framework conditions for cross-border energy initiatives. Moreover, in the 2021–2027 period, the Connecting Europe Facility (CEF) Energy programme introduced a new category of projects: cross-border projects in the field of renewable energy. This addition is designed to enhance cross-border collaboration, recognizing the importance of regional cooperation in accelerating the deployment of renewable energy. The CEF Energy complements other EU funding Programmes for renewables by specifically targeting initiatives that bridge national efforts, creating synergies that optimize resource use and infrastructure.
Energy Communities	Transposition for energy communities and support measures	Latvia has introduced two definitions: a general definition of energy communities and specific references to RECs and "electricity communities" (elektroenerģijas kopiena). The proximity criterion and enabling framework will be detailed in future legislation under the Law on Energy. As the concept is new, a complete enabling framework and specific measures for RECs in the support scheme are not yet established. The definition of RECs in Lithuania, at least in theory, can be viewed as a positive example. The Law of the Republic of Lithuania on Electricity has incorporated provisions for CECs, which establish the legal foundation. This framework is further supported by a Resolution from the State Energy Regulatory Board outlining procedures for granting and revoking CEC status, as well as providing information about these communities. However, the development of an enabling framework for both RECs and CECs remains pending in the transposition process.
General and Electricity Network	Organisation of the national electricity network	Interconnection levels of the national electricity networks are regular. Overall, interconnected as part of the Baltic electricity market, with plans for further synchronization with the European grid. The national power grids of Latvia and Lithuania are organized to ensure stability and efficiency in power transmission and distribution. Both countries have integrated transmission systems operated by their

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Categories	Indicators	Description
	Electricity transfer and heat transfer	respective transmission system operators (TSOs) to facilitate the safe and adequately cross-border flow of electricity. Harmonization of grid operations and regulatory practices are in line with EU and ENTSO-E regulations. The transfer of electricity between Latvia and Lithuania is facilitated by interconnected networks that enable electricity exchange according to European market rules. This interconnection facilitates the balancing of supply and demand, contributing to energy security and the integration of renewable energy. Latvia and Lithuania are interconnected through the Baltic power grid, primarily through the NordBalt interconnector, which links Lithuania to Sweden and provides an important route for electricity exchange. Additionally, the LitPol Link connects Lithuania and Poland, which is also essential for the electricity flows between the two Baltic states. The countries do not have an interconnected network for heat exchange.
	Congestion Management	Latvia and Lithuania actively collaborate on congestion management to ensure the reliability and stability of their interconnected power grids and the entire European electricity grid. They use coordinated measures, such as market mechanisms and real-time grid management and dispatching tools, to manage grid imbalances according to EU guidelines to promote efficient cross-border electricity trade and grid security and reliability. Aligning tariffs, grid fees, and regulations will ensure fair access for decentralized energy producers. Leveraging EU funding programs and coordinating through ENTSO-E will be essential to strengthening cross-border electricity exchange and supporting a resilient and efficient energy network.

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Lithuania-Poland

Categories	Indicators	Description
Cross-border Energy Communities	Legal framework for cross-border energy communities	Poland's legislation, amended in July 2023, imposes several strong obstacles to cross-border participation: - CECs are restricted to operating within a single distribution system operator's area, with production connected to networks of no more than 110 kV. - RECs must be located within the same electricity distribution system operator's area. - Energy cooperatives face additional restrictions, limited to three directly neighbouring municipalities, excluding urban areas. - CECs are explicitly prohibited from including connections to other countries. This regulatory landscape presents substantial obstacles to establishing formal CBECs. The fact that Czech Republic lacks specific provisions for CBECs creates uncertainty regarding their legal status and operational framework. Poland's restrictive approach, with geographical limitations and explicit prohibition of cross-border connections for CECs, directly hinders cross-border participation.
		The Lithuanian legal framework lacks specific provisions for CBECs but has some regulations for energy communities: a) For RECs, at least 51% of the votes at the general meeting of shareholders must belong to natural persons. These shareholders must have their place of residence declared in the municipality where the energy production facility is planned or in bordering

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		municipal elderships. b) For CECs, no specific geographical restrictions are mentioned. Opportunities to start cross-border activities can be found in the Interreg VI-A Lithuania-Poland Programme 2021-2027. Even if there is no thematic focus on energy, cross-border activities to strengthen cooperation of local, regional and national stakeholders can be funded. This can promote a supportive environment for advancing cross-border energy cooperation and the development of CBEs and quasi-CBEs. In addition, other Interreg B programmes (for example, Interreg Baltic Sea with its 2021-2027 project Energy Equilibrium helping local authorities to identify optimal renewable energy strategies, to exploit of local renewable energy potential through storage solutions and to simulate energy development scenarios for low-carbon systems, or the 21-27 StartSun project dedicated to develop role models for further creation of energy communities in in the Baltic Sea Region) and Interreg Europe (for example, the 2021-2027 project REC4EU – Renewable Energy Communities for EU regions) can also be used to positively influence framework conditions for cross-border energy initiatives. Moreover, in the 2021–2027 period, the Connecting Europe Facility (CEF) Energy programme introduced a new category of projects: cross-border projects in the field of renewable energy. This addition is designed to enhance cross-border collaboration, recognizing the importance of regional cooperation in accelerating the deployment of renewable energy. The CEF Energy complements other EU funding Programmes for renewables by specifically targeting initiatives that bridge national efforts, creating synergies that optimize resource use and infrastructure.
	Private/Public financing instruments	

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Categories	Indicators	Description
Energy Communities	Transposition for energy communities and support measures	The definition of RECs in Lithuania, at least in theory, can be viewed as a positive example. The Law of the Republic of Lithuania on Electricity has incorporated provisions for CECs, which establish the legal foundation. This framework is further supported by a Resolution from the State Energy Regulatory Board outlining procedures for granting and revoking CEC status, as well as providing information about these communities. However, the development of an enabling framework for both RECs and CECs remains pending in the transposition process. According to Polish legislation, RECs are introduced as a subset of CECs. The updated laws for CECs and RECs specify participation criteria, including decision-making and control mechanisms. The legislation also broadens the range of legal entities that can establish an energy community and clarifies permissible activities in the electricity, gas, and heating sectors. However, CECs are restricted to operating within a single distribution network area, significantly limiting their operational scope and ability to engage in diverse activities. Overall, the new legislation represents an improvement, as there was previously no legal framework for energy communities, though a comprehensive enabling framework is not in place so far.
	Organisation of the national electricity network	Interconnection levels of the national electricity networks are regular. Overall, the LitPol Link provides key interconnection but still has limitations in capacity. The national power grids of Lithuania and Poland are organized to ensure stability and efficiency in power transmission and distribution. Both countries have integrated transmission systems operated by their respective TSOs to facilitate the safe and adequately cross-border flow of electricity. Harmonization of grid operations and regulatory practices are in line with EU and ENTSO-E regulations.
General and Electricity Network	Electricity transfer and heat transfer	The transfer of electricity between Lithuania and Poland is facilitated by interconnected networks that enable electricity exchange according to European market rules. This interconnection facilitates the balancing of supply and demand, contributing to energy security and the integration of renewable energy. The Lithuania-Poland electricity interconnection is primarily facilitated by
	Congestion Management	

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Categories	Indicators	Description
		the LitPol Link, which connects the power grids of Lithuania and Poland. This high-voltage direct current (HVDC) link plays a central role in facilitating electricity exchange between the two countries. The LitPol Link is a key part of the Baltic Sea Regional Energy Market, allowing Lithuania to access electricity from the broader Central European grid, which helps balance supply and demand, especially during peak periods or when renewable generation in the region is high. The countries do not have an interconnected network for heat exchange. Lithuania and Poland actively collaborate on congestion management to ensure the reliability and stability of their interconnected power grids and the entire European electricity grid. They use coordinated measures, such as market mechanisms and real-time grid management and dispatching tools, to manage grid imbalances according to EU guidelines to promote efficient cross-border electricity trade and grid security and reliability. Aligning tariffs, grid fees, and regulations will ensure fair access for decentralized energy producers. Leveraging EU funding programmes and coordinating through ENTSO-E will be essential to strengthening cross-border electricity exchange and supporting a resilient and efficient energy network.

Malta-Italy

Categories	Indicators	Description
Cross-border Energy Communities	Legal framework for cross-border energy communities	Malta's regulatory framework is notably progressive in its approach to cross-border participation within Energy Communities. Subsidiary Legislation 545.35 and 545.34 provide that RECs and CECs shall be open to cross-border participation. This explicit provision for cross-border participation is unique and aligns with EU Directives IMED and REDII on energy communities. The Italian Decree published in January 2024 does not mention or provide provisions for RECs and CECs to be open to cross-border participation. This lack of specific provisions creates a regulatory gap for CBECs involving Italy. There is no land border shared by Italy and Malta. However, cross-border cooperation on energy is possible. Funding opportunities exist in the context of the Interreg VI-A Italy-Malta Programme 2021-2027. The Programme seeks to strengthen cross-border cooperation between the two countries. Even if there is no thematic focus on energy, cross-border activities to strengthen cooperation of local, regional and national stakeholders can be funded. This can promote a supportive environment for advancing generally cross-border energy cooperation.
	Private/Public financing instruments	In addition, there exist funding opportunities within Interreg B Programmes such as the Interreg Euro-MED Programme 2021-2027. The Green Living Areas Mission of the Programme aims to improve the lives of Mediterranean citizens by promoting the development of green living areas. As part of the Interreg Euro-MED Programme, the Mission undertakes projects that support local communities to life dedicated to green development. This includes also the Green Energy Working Group, building on results of past projects such as the Interreg Med 2014-2020 horizontal project Renewable Energy, which designed a model to

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		support rural and island communities in joining the energy transition, including energy communities, energy governance and territorial energy planning. In addition, Interreg Europe (for example, the 2021-2027 project REC4EU – Renewable Energy Communities for EU regions) can also be used to positively influence framework conditions for cross-border energy initiatives. Moreover, in the 2021–2027 period, the Connecting Europe Facility (CEF) Energy programme introduced a new category of projects: cross-border projects in the field of renewable energy. This addition is designed to enhance cross-border collaboration, recognizing the importance of regional cooperation in accelerating the deployment of renewable energy. The CEF Energy complements other EU funding Programmes for renewables by specifically targeting initiatives that bridge national efforts, creating synergies that optimize resource use and infrastructure.
	Partnerships available	Cooperation exists already when it comes to energy infrastructure. In January 2025, the second interconnector between Malta and Italy has officially received approval in both countries. The IC2 interconnector will include a 122-kilometer high-voltage alternating current (HVAC) cable system, featuring a 99-kilometer submarine cable operating at 220 kV. This cable will connect Maghtab in Malta to Ragusa in Sicily, running parallel to the existing HVAC link commissioned in 2015. The 2nd cable link will strengthen the electricity interconnectivity with the EU electricity network, allow for increased importation of electricity sourced from renewables, optimise the use of local power generation, whilst allowing the increase in local renewable energy sources through the enhancement of the grid stability and balancing of intermittent RES. It will be co-funded by the Malta 2021-2027 ERDF/CF/JTF Programme.

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Categories	Indicators	Description
Energy Communities	Transposition for energy communities and support measures	Malta has yet to develop specific legislation or initiatives for energy communities, although there are regulatory exemptions for self-consumption. Although the structure of the Maltese electricity system, with only one electricity supplier (Enemalta is designated as the exclusive electricity supplier in Malta), as well as the limited space available for the deployment of PV installations, can be considered barriers for the setting up of renewable energy communities, the legal framework originally established for cooperatives, also lends itself for renewable energy communities. Italy has made progress in transposing directives and introducing specific measures for renewable energy communities. Two definitions were introduced for RECs and CECs, in line with the EU Directives. Supporting schemes for RECs are in place, e.g., National Recovery and Resilience Plan (NRRP), specific premium tariff incentivizing real time self-consumption, while not for CECs.
General and Electricity Network	Organisation of the national electricity network	Interconnection levels of the national electricity networks are regular. Overall, connected to Italy via the Malta-Sicily interconnector, ensuring electricity imports but with limited redundancy. The national power grids of Malta and Italy are organized to ensure stability and efficiency in power transmission and distribution with the new HVDC recent Interconnection link. Both countries have integrated transmission systems to facilitate the safe and adequately cross-border flow of electricity. Harmonization of grid operations and regulatory practices are in line with EU and ENTSO-E regulations.
	Electricity transfer and heat transfer	The transfer of electricity between Malta and Italy is facilitated by interconnected networks that enable electricity exchange according to European market rules. This interconnection facilitates the balancing of supply and demand, contributing to energy security and the integration of renewable energy.
	Congestion Management	The Malta-Italy electricity interconnection is primarily facilitated by the Sicily-Malta interconnector (SMI), an undersea high-voltage direct current (HVDC) cable that connects Malta's electricity grid with Sicily, part of Italy. The countries do not have an interconnected network for heat exchange. Malta and Italy actively collaborate on congestion management to ensure the reliability and stability of their interconnected power grids and the entire

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Categories	Indicators	Description
		European electricity grid. They use coordinated measures, such as market mechanisms and real-time grid management and dispatching tools, to manage grid imbalances according to EU guidelines to promote efficient cross-border electricity trade and grid security and reliability. Aligning tariffs, grid fees, and regulations will ensure fair access for decentralized energy producers. Leveraging EU funding programmes and coordinating through ENTSO-E will be essential to strengthening cross-border electricity exchange and supporting a resilient and efficient energy network.

Poland-Slovakia

Categories	Indicators	Description
Cross-border Energy Communities	Legal framework for cross-border energy communities	The legal framework in Slovakia lacks specific provisions for cross-border cooperation and participation of energy communities: Act 256/2022 of 22 June 2022, which amended Act 251/2012 on Energy, does not mention CBECs. The amendment 363/2022 of 19 October 2022 to Act 309/2009 on Support for Renewable Energy Sources also does not address provisions for RECs and CECs to be open to cross-border participation. This absence of specific regulations creates a legislative gap for cross-border energy community initiatives involving Slovakia. Poland's legislation, amended in July 2023, imposes several strong obstacles to cross-border participation: - CECs are restricted to operating within a single distribution system operator's area, with production connected to networks of no more than 110 kV. - RECs must be located within the same electricity distribution system operator's area. - Energy cooperatives face additional restrictions, limited to three directly neighbouring municipalities, excluding urban areas. - CECs are explicitly prohibited from including connections to other countries.

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Categories	Indicators	Description
	Private/Public financing instruments	This regulatory landscape presents substantial obstacles to establishing formal CBECS. The fact that Czech Republic lacks specific provisions for CBECS creates uncertainty regarding their legal status and operational framework. Poland's restrictive approach, with geographical limitations and explicit prohibition of cross-border connections for CECs, directly hinders cross-border participation. Opportunities to start cross-border cooperation activities can be found in the Interreg VI-A Poland-Slovakia Programme 2021-2027. Although there is no specific focus on energy in the Programme, available funding for joint cross-border institutional cooperation might help to find a common basis for cross-border energy cooperation. In addition, Interreg B programmes such as the Interreg Central Europe Programme 2021-2027 (with its 2021-2027 project HERCULES-CE to enhance the energy transition in Central Europe with the support of renewable energy communities) or the Interreg Danube Programme 2021-2027 (with the 2021-2027 projects NRGCOM and DECA dedicated to accelerate RECs and CECs and create appropriate operational conditions for energy communities in the Danube region), as well as Interreg Europe (for example, the 2021-2027 project REC4EU – Renewable Energy Communities for EU regions) can also be used to positively influence framework conditions for cross-border energy initiatives. Moreover, in the 2021–2027 period, the Connecting Europe Facility (CEF) Energy programme introduced a new category of projects: cross-border projects in the field of renewable energy. This addition is designed to enhance cross-border collaboration, recognizing the importance of regional cooperation in accelerating the

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Categories	Indicators	Description
	Partnerships available	deployment of renewable energy. The CEF Energy complements other EU funding Programmes for renewables by specifically targeting initiatives that bridge national efforts, creating synergies that optimize resource use and infrastructure. Several cross-border cooperation structures exist already and operate in this cross-border area, such as Euroregion Beskidy, Euroregion Carpathian, EGTC Tritia and Euroregion Tatry. Even if they do not focus on energy as such, they might facilitate networking and partnership opportunities, for instance, on cross-border energy community projects or related initiatives..
Energy Communities	Transposition for energy communities and support measures	According to Polish legislation, RECs are introduced as a subset of CECs. The updated laws for CECs and RECs specify participation criteria, including decision-making and control mechanisms. The legislation also broadens the range of legal entities that can establish an energy community and clarifies permissible activities in the electricity, gas, and heating sectors. However, CECs are restricted to operating within a single distribution network area, significantly limiting their operational scope and ability to engage in diverse activities. Overall, the new legislation represents an improvement, as there was previously no legal framework for energy communities, though a comprehensive enabling framework is still absent. Slovakia, on the other hand, is still in the early stages, with two definitions of RECs and CECs that reflect largely the definition provided in the relevant EU Directives. The Program Slovensko was designed as a key national policy instrument and initiative to channel financial and technical support towards the development of energy communities. This programme is seen as a vital tool in overcoming current barriers to the growth of ECs in Slovakia. However, there are still several obstacles such as insufficient legal support, the need for an effective billing system, and the lack of economic analysis of the benefits of ECs.

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Categories	Indicators	Description
General and Electricity Network	Organisation of the national electricity network	Interconnection levels of the national electricity networks are regular.
	Electricity transfer and heat transfer	The national power grids of Poland and Slovakia are organized to ensure stability and efficiency in power transmission and distribution. Both countries have integrated transmission systems operated by their respective TSOs to facilitate the safe and adequately cross-border flow of electricity. Harmonization of grid operations and regulatory practices are in line with EU and ENTSO-E regulations. Overall, the interconnection supports electricity trade, but Poland's coal-heavy generation limits flexibility. The transfer of electricity between Poland and Slovakia is facilitated by interconnected networks that enable electricity exchange according to European market rules. This interconnection facilitates the balancing of supply and demand, contributing to energy security and the integration of renewable energy. The Poland-Slovakia electricity interconnection is facilitated by several high-voltage transmission lines, including a major AC interconnection linking the grids of both countries. These lines allow electricity to flow in both directions between Poland and Slovakia, supporting electricity trade and helping balance supply and demand in both countries. The countries do not have an interconnected network for heat exchange.
	Congestion Management	Poland and Slovakia actively collaborate on congestion management to ensure the reliability and stability of their interconnected power grids and the entire European electricity grid. They use coordinated measures, such as market mechanisms and real-time grid management and dispatching tools, to manage grid imbalances according to EU guidelines to promote efficient cross-border electricity trade and grid security and reliability. Aligning tariffs, grid fees, and regulations will ensure fair access for decentralized energy producers. Leveraging EU funding programs and coordinating through ENTSO-E will be essential to strengthening cross-border electricity exchange and supporting a resilient and efficient energy network.

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Portugal-Spain

Categories	Indicators	Description
Cross-border Energy Communities	Legal framework for cross-border energy communities	The Royal Decree 23/23 of June 2020 in Spain does not mention cross border participation or cooperation among Energy Communities across borders. This lack of specific provisions on cross-border participation creates a regulatory gap for cross-border energy community initiatives involving Spain. Portugal's legal framework also lacks specific provisions for RECs or CECs to be open to cross-border participation: Decree 162/25 October 2019 does not mention CBECs or cross-border cooperation. Decree 15/14 January 2022 also lacks any reference to cross-border cooperation.
	Private/Public financing instruments	Opportunities for cross-border energy cooperation are offered within the Interreg VI-A Spain-Portugal (POCTEP) Programme 2021-2027 covering the cross-border area between the two countries. The programme offers several possibilities to co-finance projects that want to start or strengthen cooperation on energy issues. First, under Priority 3. Advance the ecological transition and adaptation to climate change in the cross-border area through cooperation. Here, two Specific objectives can be relevant for the development of CBECs or related initiatives, i.e. the first one funding energy efficiency projects, for example, actions for the development and implementation of joint systems for efficient energy distribution (including smart grids and ICT systems) and storage in the cross-border area in a context of energy system integration. And the second one, with a focus on renewable energy, funding for example, joint actions for research, promotion and development of small-scale pilot projects based on renewable energy (for example, energy communities, self-consumer groups) in the cross-border area. Furthermore, under Priority 6, projects can promote the development of multisectoral strategies for integrated and sustainable development. Finally, under Priority 7, project can

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Categories	Indicators	Description
	Partnerships available	present proposals to overcome border obstacles by applying a transformative multi-level governance approach to cross-border cooperation. In fact, several projects were already selected to be financed under the current programme. Such projects are dedicated to the preparation of cross-border energy communities, to the cross-border connection of energy communities or to designing cross-border support services for energy communities. Examples of these projects are: the project TRANSCOM-EUROACE, the project HI-MOV on renewable hydrogen, the project EUROBEC-Energy, the project COMENERG, the project CEL-Rural, the project AGERAR-Plus and the project ALDEALIX. In addition, Interreg B Programmes, such as Interreg SUDOE 2021-2027 Programme (Spain-Portugal-France), for example, with its project SharedH2, promoting and validating the use of renewable hydrogen as a flexible and distributed energy storage solution in local energy communities as an alternative for the empowerment of rural areas) as well as Interreg Europe (for example, the 2021-2027 project REC4EU – Renewable Energy Communities for EU regions) can also be used to positively influence framework conditions for cross-border energy initiatives. Moreover, in the 2021–2027 period, the Connecting Europe Facility (CEF) Energy programme introduced a new category of projects: cross-border projects in the field of renewable energy. This addition is designed to enhance cross-border collaboration, recognizing the importance of regional cooperation in accelerating the deployment of renewable energy. The CEF Energy complements other EU funding Programmes for renewables by specifically targeting initiatives that bridge national efforts, creating synergies that optimize resource use and infrastructure. Other solid cross-border entities exist in this area, that might be helpful in the setting-up of cross-border energy initiatives or CBEC. Examples are the EGTC Euroregion Galicia-Norte de Portugal, EGTC Rio Minho, the Eurocidade Chaves-Verin, the EURBEC, the EUROACE, the Euroregion Alentejo-Algarve-Andalucia, and the EGTC Duero-Douro. Cooperation on energy is already quite advanced in some of the cross-border areas along

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Categories	Indicators	Description
		the Spanish-Portuguese border. One example is Efi-Duero Energy, established as a European Cooperative Society. It is a European cross-border energy trading cooperative launched in 2017 in the territory covered by the EGTC Duero-Douro (Portugal-Spain). It consists of the Duero-Douro EGTC and 26 Spanish and Portuguese public entities (mostly villages), forming the first European energy cooperative based on the SCE legal instrument.
Energy Communities	Transposition for energy communities and support measures	Portugal has transposed provisions for RECs and CECs, with investment support measures under the Recovery and Resilience Plan and tools like an online e-Portal for energy community registration and information sharing. However, the framework lacks detailed regulations specific to renewable energy communities. In Spain, only RECs have been defined in national legislation, with self-consumption measures and initial steps toward an enabling framework. The Spanish National Energy and Climate Plan (NECP) outlines measures to promote energy communities. They are also highlighted in the national Recovery and Resilience Plan and the national Strategy España 2050, in the chapters on the Urban and Rural Agenda, and the Fair and Inclusive Energy Transition. The Spanish Energy Agency IDAE offers several lines of support for the development and setting-up of local Energy Communities in Spain, including financial support to local support offices and the funding of strategic projects to upscale energy communities.
General and Electricity Network	Organisation of the national electricity network	Interconnection levels of the national electricity networks are good. The national power grids of Portugal and Spain are organized to ensure stability and efficiency in power transmission and distribution. Both countries have integrated transmission systems operated by their respective

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Categories	Indicators	Description
	Electricity transfer and heat transfer	TSOs to facilitate the safe cross-border flow of electricity. Harmonization of grid operations and regulatory practices are in line with EU and ENTSO-E regulations. Overall, high degree of market integration, with Iberian Electricity Market (MIBEL) ensuring seamless cross-border electricity trading. The transfer of electricity between Portugal and Spain is facilitated by interconnected networks that enable electricity exchange according to European market rules. This interconnection facilitates the balancing of supply and demand, contributing to energy security and the integration of high shares of renewable energy installed in the two neighbouring countries. The countries do not have an interconnected network for heat exchange.
	Congestion Management	Portugal and Spain actively collaborate on congestion management to ensure the reliability and stability of their interconnected power grids and the entire European electricity grid. They use coordinated measures, such as real-time grid management and dispatching tools, to manage grid imbalances according to EU guidelines to promote efficient cross-border electricity trade and grid security and reliability. Aligning tariffs, grid fees, and regulations will ensure fair access for decentralized energy producers. Leveraging EU funding programmes and coordinating through ENTSO-E will be essential to strengthening cross-border electricity exchange and supporting a resilient and efficient energy network.

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