



Activity 3.6:

Main Output 3.3:

White Paper on the successful creation
and more sustainable functioning of
renewable energy communities

NRGCOM project

Partner Version: Energy Cities Romania/ OER

Summary

The white paper addresses the critical energy challenges in the Danube region and outlines key recommendations for promoting Renewable Energy Communities (RECs). The Danube region covered by the NRGCOM project comprises 12 target countries—Hungary, Austria, Bulgaria, Germany, Croatia, Czech Republic, Moldova, Montenegro, Romania, Slovenia, Slovakia, and Serbia—with highly diverse levels of development and regulatory frameworks. While countries such as Austria and Germany have operated functioning energy communities for years, others, including Montenegro, Croatia, Serbia, and Moldova, remain at a very early stage of development and still lack fully functioning energy communities.

Incorporating also the results of the pilot tests (A.3.2 and A.3.4) of the project NRGCOM, this White Paper supports the more effective functioning of energy communities in the Danube Region by 1) listing the obstacles encountered and the solutions to overcome them, 2) defining the conditions for the successful creation of an energy community, 3) offering development opportunities for existing energy communities and 4) summarising all the previous findings and sharing the results of the research and pilot actions, which have been developed in the activities within special objective 1 to 3 of the project NRGCOM.

In line with the title of this white paper, the document addresses two closely connected dimensions. First, it identifies the legal, financial, technical, and organisational conditions necessary for the successful establishment of new Renewable Energy Communities in the Danube region. Second, it examines the measures required to ensure the long-term sustainability, resilience, and efficient operation of already existing energy communities. Particular attention is given to governance models, citizen participation, access to financing, regulatory support, digitalisation, and cross-sector cooperation, all of which are essential both for the creation of new RECs and for strengthening the performance and durability of existing ones.

Accordingly, the chapters of this paper try to consistently reflect this dual perspective by highlighting not only how Renewable Energy Communities can be initiated, but also how they can remain economically viable, socially inclusive, and environmentally sustainable over the long term. In this regard PART A of the document applies to energy communities in general and PART B takes a deeper dive in the individual framework and circumstances of each partner region.

Content

Summary	1
Part A: Overview of energy communities' development in the Danube region	3
Initial situation: The Energy Landscape of the Danube Region	3
Geopolitical and Energy Security Context	3
The Socio-Economic Challenge: Energy Poverty and Affordability	4
RECs as a Transformative Mechanism	5
Regulatory and Market Heterogeneity	7
Challenges within the Energy Community Framework	10
Market Structure and Grid Regulation Barriers	11
Comprehensive Analysis of Barriers and Bottlenecks	12
Legal and Regulatory Uncertainty (The Foundation)	12
Administrative and Capacity Gaps (The Operational Hurdles)	12
Financial Barriers and Investment Mobilization (The Economic Model)	13
Technical and Infrastructural Constraints	14
The Value Proposition: Benefits of Community-Led Energy Transition	16
Socioeconomic Advantages and Local Resilience	16
Environmental Impact and Climate Mitigation	17
System Benefits and Grid Stability	18
Social Cohesion	19
Models, Solutions, and Practical Guidance for REC Establishment	20
Operational and Governance Models (Best Practices, e.g. Association)	20
Innovative Financing Mechanisms for Sustainability (Crowdfunding, Loans)	21
Policy Recommendations based on NRGCOM experience findings	21
Dissemination, Capitalization, and Transnational Strategy (White Paper, Ambassadors, Pilot Projects)	23
Key executive messages	25
Part B: National Compendium of REC Status and Implementation (Country-Specific Document)	26
Starting Position and Regulatory Foundation	26
National Energy Profile	26
Dependency rate on energy imports in Romania from 2000 to 2023	28
Legal Framework	29
Institutional Landscape	30
Maturity Level and Ecosystem (Established, Emerging, Nascent)	32
Analysis of Specific National Barriers	33
Legislative and Administrative Obstacles	33
Market and Infrastructure Hurdles	33
Financial and Capacity Gaps	33
Case Studies and Pilot Capitalization	34

Best Practice Example (National)	34
Results of the NRGCOM Pilot Project	36
Policy recommendation for Energy community development based on NRGCOM project experience	36
References	37



Part A: Overview of energy communities' development in the Danube region

Initial situation: The Energy Landscape of the Danube Region

Geopolitical and Energy Security Context

At the start of the NRGCOM project in 2024, the Danube region was characterized by highly diverse energy systems, still largely shaped by fossil fuels and centralized energy infrastructures. In many countries, coal, natural gas, and oil continued to form the backbone of energy supply, while nuclear energy also played a major role in specific national contexts, particularly in Slovakia. At the same time, the deployment of renewable energy sources and decentralized energy solutions varied significantly across the region. This structural heterogeneity resulted in differing levels of energy dependency. Several countries, including Croatia and Moldova, remained heavily reliant on imported fossil fuels, making them particularly vulnerable to energy price fluctuations and supply disruptions.

The energy crises of recent years further highlighted these vulnerabilities and strengthened the political and societal need to diversify energy sources and improve energy resilience. Another defining feature at the beginning of the project was the strong dominance of centralized energy systems. Large-scale fossil-fuel and nuclear power plants continued to determine electricity generation in most participating countries, while decentralized approaches — including Renewable Energy Communities (RECs) — were still at an early stage of development in many parts of the region. Existing grid structures, administrative procedures, and regulatory frameworks were often not yet adapted to support citizen-led and locally organized energy initiatives.

The baseline analysis conducted within the NRGCOM project revealed major differences in the legal and practical development of RECs across the Danube region. Countries such as Austria, Germany, Slovakia, and Slovenia already had relatively well-established legal frameworks and functioning energy communities with several years of practical experience. In contrast, Montenegro, Serbia, Moldova, and partly Croatia and Romania had either no functioning energy communities or only limited pilot initiatives, while their regulatory frameworks were still under development or only partially implemented like in Hungary.

By the time of preparing this White Paper, important progress could be observed in several countries of the region. Regulatory discussions around RECs have intensified, awareness among municipalities and citizens has increased, and initial pilot projects and support mechanisms have started to emerge even in countries that had previously lacked functioning energy communities.

Nevertheless, significant disparities between countries remain. While some states are already focusing on improving the long-term sustainability, financing models, and governance structures of existing RECs, others are still addressing fundamental legal, institutional, and technical barriers necessary for the initial establishment of energy communities. This uneven development demonstrates both the dynamic progress achieved since the launch of the NRGCOM project and the continuing need for targeted policy support and regional cooperation across the Danube region.

The Socio-Economic Challenge: Energy Poverty and Affordability

In addition to geopolitical and structural energy challenges, energy affordability represents one of the most pressing socio-economic issues across the Danube region. Energy poverty continues to affect a significant share of the population, particularly low-income and vulnerable households, which are forced to spend a disproportionately large part of their income on electricity, heating, and other essential energy services. As a result, many households struggle to maintain adequate indoor comfort and energy security, especially during periods of rising energy prices and market instability.

The causes of energy poverty are multifaceted and deeply interconnected. They include increasing energy costs, outdated and energy-inefficient building stock, limited financial capacity to invest in energy-efficient technologies, and unequal access to renewable energy solutions. In many countries of the Danube region, residential buildings were constructed decades ago and suffer from poor insulation, inefficient heating systems, and high energy losses. At the same time, many households lack access to financing mechanisms or support schemes that would enable investments in building renovation, rooftop photovoltaic systems, heat pumps, or other sustainable technologies. Energy should therefore not be viewed solely as a technical or economic commodity, but as a basic prerequisite for social participation, public health, and quality of life. Energy poverty has far-reaching consequences, affecting physical and mental health, educational opportunities, labour productivity, and overall social inclusion. It also reinforces existing social inequalities and regional disparities.

In this context, there is a growing risk of a “two-tier energy transition.” While wealthier households, companies, and municipalities are increasingly able to invest in photovoltaic systems, battery storage, electric mobility, and other renewable energy technologies, lower-income groups often remain excluded from these opportunities due to financial, technical, or administrative barriers.

Without targeted support measures, the benefits of the energy transition may therefore be distributed unevenly, potentially deepening socio-economic inequalities.

Renewable Energy Communities (RECs) can play an important role in addressing these challenges by enabling citizens, local authorities, and small businesses to jointly produce, consume, and manage renewable energy at the local level. Practical experience from existing RECs demonstrates that one of the most immediate and tangible benefits for members is access to more affordable electricity prices and improved feed-in conditions for locally generated renewable energy. In addition, RECs can strengthen local energy resilience, increase citizen participation in the energy transition, and create new opportunities for social innovation and community-based investment models.

For this reason, strengthening inclusive and accessible Renewable Energy Communities should be considered not only an energy policy objective, but also an important social policy instrument for reducing energy poverty and ensuring a fair and socially balanced energy transition across the Danube region.

RECs as a Transformative Mechanism

Renewable Energy Communities (RECs) represent an innovative and increasingly important approach to addressing both energy policy objectives and broader socio-economic challenges. They are based on the principle of local, community-driven generation, consumption, sharing, and management of energy, primarily from renewable sources. By enabling citizens, municipalities, small businesses, farmers, and other local actors to actively participate in the energy system, RECs contribute to a more decentralized, democratic, and resilient energy transition. Unlike traditional energy market structures, which are typically dominated by large centralized utilities, RECs empower local communities to become active participants rather than passive consumers. This not only strengthens local energy autonomy and resilience, but also increases public acceptance of renewable energy projects and promotes greater citizen engagement in climate and energy policies.

RECs are legally independent entities and can take various organizational forms, including cooperatives, associations, partnerships, municipalities, or private companies. Regardless of their legal structure, their primary purpose is not profit maximization, but the generation of environmental, economic, and social benefits for their members and the wider local community. This community-oriented approach distinguishes RECs from conventional commercial energy suppliers.

At the European Union level, the concept of Renewable Energy Communities was formally introduced through the *Clean Energy for All Europeans Package*, particularly through the Renewable Energy Directive (RED II) and the Electricity Market Directive. These legislative frameworks define energy communities as legal entities based on open and voluntary participation, democratic governance, and local control. Their core objective is to provide environmental, economic, or social benefits to members or local areas rather than maximizing financial returns.

Where successfully implemented, RECs have demonstrated the potential to deliver multiple benefits simultaneously. In addition to providing affordable and locally produced renewable energy, they can contribute to reducing energy poverty, increasing energy security, stimulating local investment, creating regional economic value, and supporting social cohesion. Energy communities can also accelerate the deployment of renewable energy technologies by mobilizing local participation and increasing public trust in the energy transition. Functionally, RECs can perform a wide range of activities across the energy value chain. These include renewable energy production through photovoltaic systems, wind energy, biomass, hydropower, or geothermal energy; local energy distribution and sharing; electricity storage through battery systems; collective self-consumption models; demand-side management; electric mobility services; and peer-to-peer energy trading within the community.

In more advanced models, RECs may also integrate smart grid technologies, digital energy management systems, and sector coupling solutions linking electricity, heating, and mobility. As a result, RECs are increasingly viewed not only as technical energy projects, but as integrated community

development models that combine climate protection, economic resilience, social innovation, and citizen participation.

Regulatory and Market Heterogeneity

The regulatory and market landscape of the Danube region is characterized by pronounced heterogeneity, often described as a ‘patchwork’. This diversity results from differing national legal frameworks, varying levels of implementation of European directives, as well as differing market structures and infrastructural conditions. For the development of RECs, this situation represents both a challenge and a key starting point for deriving country-specific guidelines.

The Clean Energy Package

With the EU “Clean Energy Package,” a comprehensive regulatory framework has been established to strengthen the role of citizens and local actors in the energy system. Two directives are particularly relevant for energy communities: The Renewable Energy Directive (RED II) and the Electricity Market Directive.

The Directive on common rules for the internal electricity market ((EU) 2019/944) introduces new rules that enable active consumer participation—either individually or through citizen energy communities—in all markets, whether through generation, consumption, sharing or selling electricity, or by providing flexibility services through demand response. The revised Renewable Energy Directive (2018/2001/EU) aims to strengthen the role of renewable self-consumers and renewable energy communities.

Both definitions describe forms of collaboration centred around specific ownership structures, governance models, and non-commercial purposes (in contrast to traditional market actors). Due to some differences in scope and eligibility criteria, renewable energy communities can generally be considered a subset or type of citizen energy communities.

Despite these clear European requirements, the level of implementation across the Danube region remains highly uneven. The comparative analysis of the NRGCOM project identifies three key evaluation criteria:

1. Readiness of the legal framework: All EU Member States have successfully transposed the requirements of the relevant EU directives into national law. However, in some countries, secondary regulations—clarifying aspects such as grid access and energy sharing—are still lacking, which negatively affects practical implementation.
2. Availability of support: In general, all EU Member States have access to various funds supporting distributed renewable energy generation and energy communities. Other countries still need to establish support mechanisms alongside finalizing their legal frameworks.

- Implementation in practice: Germany and Austria are the two countries that have successfully implemented similar concepts in the past. However, countries such as Slovenia, Romania, and the Czech Republic have also demonstrated a high level of readiness.

The following table provides a detailed overview of the implementation status in the 12 countries according to the output 1.1.1 "Comparative Analysis Report - International comparison of national legal systems":

Country	Legal Framework	Support	Practical Implementation
Austria	Legal framework for REC and CEC established; Single Point of Contact defined; grid conditions and tariffs prescribed	Funding programs available through national and regional EU-supported instruments	Community installations since 2017; continuation under the new legal framework
Bulgaria	RECs recognized by relevant laws; implementing regulations still under development	National program for renewables in the household sector	Only for prosumers in the household sector
Croatia	Legal framework in place; categories and procedures defined	Funding available through national EU-supported instruments	Limited implementation; improvement of the quality and consistency of the legal framework required
Czech Republic	New legal framework since January 2024; registration, capacity categories, and tariff models defined	Diverse financing mechanisms and technical assistance at national and regional level	Limited implementation; new legal framework must prove effective in practice
Germany	Legal framework established; REC definition implemented, CEC not yet enshrined in law	Support schemes through various mechanisms such as feed-in tariffs and financial incentives	Energy communities successfully implemented since 2025
Hungary	Legal framework in place; responsibilities of grid operators need to be defined; restrictions for public institutions to be resolved	Financial support needs to be strengthened	Limited implementation – 18 registered energy communities

Moldova	Legal basis established; comprehensive assessment and implementing regulations to be developed	Financial support for RECs still to be established	Implementation after completion of the legal framework
Montenegro	Renewable energy law still under development	Programs to support prosumers available	After adoption of the law and implementing regulations
Romania	Legal framework established - secondary is under way; registration, grid connection rules, and tariffs defined	Funding available but limited through national and regional EU-supported (transition proinstruments	Energy communities implemented to some extent
Serbia	RECs recognized in law; further regulation required through implementing acts	Support programs provided for by law – still to be developed	Implementation after completion of the legal framework
Slovakia	Legal framework established; Single Point of Contact and procedures defined	Support mechanisms to be further developed	Limited implementation; Deterioration of the quality and consistency of the application of the legal framework; energy communities in the number of 18 entities have been gradually successfully implemented and registered since 2024.
Slovenia	Legal framework for REC and CEC established; registration, grid conditions, and tariff models defined	Support mechanisms via national EU-supported instruments	Implementation ongoing; local and regional energy agencies should play a greater role

Challenges within the Energy Community Framework

In addition to EU Member States, the Danube region also includes several countries that are part of the Energy Community (EnC). These countries have committed to gradually aligning their national energy legislation with the EU acquis, including key provisions related to renewable energy, electricity markets, and citizen participation in the energy transition. However, despite this formal commitment, many EnC contracting parties continue to face significant structural, administrative, financial, and institutional challenges in implementing these frameworks effectively. In many non-EU countries of

the Danube region, the legal and regulatory framework for Renewable Energy Communities (RECs) remains at an early stage of development.

In some cases, relevant legislation has only recently been adopted, while in others important secondary legislation, licensing procedures, or operational rules are still missing. As a result, the practical establishment and functioning of energy communities is often hindered by legal uncertainty, unclear responsibilities among institutions, and insufficient administrative capacities.

Beyond legislative gaps, additional barriers frequently include limited access to financing, low public awareness, insufficient technical expertise, weak local institutional support, and underdeveloped energy infrastructure. Grid access procedures can be complex and lengthy, while existing electricity market structures are often still designed primarily for centralized energy systems rather than decentralized and community-based models. At the same time, socio-economic conditions within many Energy Community countries can further complicate the development of RECs. Higher levels of energy poverty, lower purchasing power, and limited access to private capital often reduce the ability of households and local communities to invest in renewable energy technologies. Without targeted policy measures and inclusive financing instruments, there is a risk that the benefits of the energy transition remain concentrated among a relatively small number of actors.

Given these implementation gaps and uneven levels of development, knowledge transfer and capacity building from EU Member States with more advanced REC frameworks could play a crucial role in accelerating progress across the wider Danube region. Countries such as Austria, Germany, and Slovenia can provide valuable experience regarding legal transposition, governance models, financing mechanisms, citizen engagement, digital solutions, and practical operation of Renewable Energy Communities. Strengthening regional cooperation, and cross-border pilot initiatives could therefore significantly support both the creation of new RECs and the long-term sustainability of existing ones in Energy Community countries.

Market Structure and Grid Regulation Barriers

A decisive factor for the development of energy communities is the structure of energy markets, as well as access to and integration into existing grid infrastructures. In the Danube region, these structures are still largely designed for centralized energy generation, which makes the integration of decentralized actors more difficult.

Key barriers include:

1. Grid access and regulatory hurdles: Although energy communities formally have the right to access energy markets, administrative and regulatory barriers often persist in practice. These include complex permitting procedures, unclear responsibilities, and in some cases discriminatory grid fees or market rules. In some countries, energy communities must meet extensive requirements to participate in electricity markets or trade energy among

themselves. Integration into balancing and settlement systems also presents an additional hurdle.

2. **Technical and infrastructural limitations:** A major issue is the often-outdated grid infrastructure. Many electricity grids are not designed to accommodate a high number of decentralized generators, leading to capacity constraints and technical challenges. This particularly affects rural areas, where the potential for renewable energy is often high but grid infrastructure is insufficiently developed. The stable integration of energy communities into existing grid systems remains a key challenge, especially in countries with highly centralized energy structures.
3. **Market integration and business models:** Existing market mechanisms are often not tailored to the needs of energy communities. Traditional market models are based on large-scale energy producers and standardized trading processes, whereas RECs are characterized by flexible, local, and often small-scale structures. This leads to challenges in marketing surplus energy, setting prices within the community, and adapting to dynamic consumption and production patterns. Although platforms and mechanisms to support energy communities (e.g., for data exchange or energy trading) already exist in some countries, they are not yet widely established and are often technically and organizationally complex.

Comprehensive Analysis of Barriers and Bottlenecks Legal and Regulatory Uncertainty (The Foundation)

One of the fundamental challenges for the development of RECs in the Danube region lies in legal and regulatory uncertainty. Although European directives define a general framework, their national implementation is often inconsistent, incomplete, or subject to interpretation. This creates significant uncertainty for the planning and implementation of energy communities. A key issue is the lack of clarity in defining energy communities. While most countries are guided by European directives, differences remain in legal classification, permitted activities, and requirements regarding membership structure and governance. These differences hinder not only the comparability of models but also the transferability of successful approaches between countries.

In addition, restrictive regulatory provisions can have a limiting effect. In many cases, energy communities are primarily understood as non-profit organizations aimed at generating social, environmental, or local economic benefits. However, this orientation often limits profit distribution and reduces attractiveness for private investment. As a result, the development of viable business models becomes more difficult, particularly in the early stages when high investments are required. Another source of uncertainty is the dynamic nature of legislation. In many countries, the regulatory framework is still evolving or continuously being adjusted. This instability complicates long-term planning and significantly increases risks for project developers and investors.

Administrative and Capacity Gaps (The Operational Hurdles)

Beyond legal frameworks, administrative and organisational challenges represent a major barrier to the effective implementation of Renewable Energy Communities (RECs) across the Danube region. In practice, the establishment and operation of RECs are often associated with complex, time-consuming, and resource-intensive administrative procedures, which can be particularly difficult for smaller initiatives, municipalities, or citizen groups to manage.

Key challenges include lengthy permitting and approval processes, the formal registration of legal entities, tax and accounting obligations, as well as requirements related to grid connection, metering, and participation in electricity markets. These procedures are frequently not harmonised and can vary considerably between countries, regions, or even individual administrative bodies. As a result, project developers are often confronted with a fragmented regulatory environment, leading to uncertainty, delays in project implementation, and increased administrative costs.

A further critical constraint is the limited organisational and technical capacity within many emerging energy communities. RECs are typically initiated and driven by citizens, local authorities, or small associations that rely heavily on voluntary engagement. While this bottom-up approach is a core strength of the model, it often comes with a lack of professional expertise in key areas such as project development, legal structuring, financial planning, energy system design, and long-term operational management. Given the technical and regulatory complexity of modern energy systems, these capacity gaps can significantly slow down or even prevent successful project implementation.

This situation is further reinforced by the absence or limited availability of centralised support structures. In many countries, there are no dedicated one-stop shops, coordination platforms, or specialised agencies that provide structured guidance for energy communities throughout the project lifecycle. The lack of such institutional support leads to information asymmetries, duplicated efforts, and inefficiencies, increasing transaction costs for all stakeholders involved. In addition, the absence of clearly defined advisory services makes it more difficult for new initiatives to navigate administrative requirements and access available funding or support schemes.

Overall, these administrative, organisational, and capacity-related barriers highlight that the successful deployment of RECs depends not only on favourable legal frameworks, but also on strong institutional ecosystems that can actively support implementation on the ground.

Financial Barriers and Investment Mobilization (The Economic Model)

The financial dimension represents another key challenge for the development and scaling of Renewable Energy Communities (RECs) across the Danube region. The establishment of RECs typically requires significant upfront investment, particularly for renewable energy generation assets such as photovoltaic systems, wind turbines, biomass installations, as well as energy storage technologies and, where applicable, supporting infrastructure such as metering systems or local distribution

components. For many citizen groups, municipalities, and small organisations, mobilising this initial capital remains a major barrier. Although a range of financing instruments theoretically exists—including national and regional public funding schemes, European Union programmes, private sector investment, cooperative financing models, and community-based crowdfunding approaches—access to these mechanisms is often complex and uneven. Application procedures can be administratively demanding, require significant technical documentation, and involve long approval timelines. In addition, many initiatives face difficulties in identifying suitable funding opportunities due to fragmented information landscapes and limited advisory support. In several countries of the region, dedicated financial support structures for energy communities are still underdeveloped or entirely absent, further limiting access to capital.

A further structural challenge lies in the uncertainty and variability of RECs' business models. In most cases, energy communities generate revenues through a combination of self-consumption savings, internal cost-sharing mechanisms, and the sale of surplus electricity to the grid. However, these revenue streams are strongly influenced by national regulatory frameworks, grid tariffs, market design, and fluctuating energy prices. As a result, income projections are often only partially predictable, making long-term financial planning more difficult and increasing perceived investment risk.

This uncertainty is compounded by the relatively high investment risk profile of many REC projects. High upfront capital expenditures coincide with uncertain and sometimes volatile revenue streams, while potential changes in regulatory frameworks, subsidy schemes, or electricity market rules add an additional layer of risk. In many cases, this combination of financial uncertainty and regulatory instability results in delayed investment decisions, scaled-down project designs, or the complete abandonment of otherwise viable initiatives. These financial barriers significantly limit the pace of REC development in many parts of the Danube region and underline the need for more stable support schemes, simplified access to funding, and innovative financing mechanisms tailored specifically to community-based energy projects.

Technical and Infrastructural Constraints

Technical and infrastructural conditions represent another significant barrier to the development and scaling of Renewable Energy Communities (RECs) across the Danube region. Many existing energy systems were historically designed around centralized generation models and large-scale infrastructure, and are therefore only partially suited to integrating decentralized, flexible, and community-based energy structures. A key challenge is limited grid connection capacity and insufficient grid readiness in many areas. In numerous regions, distribution grids are not yet adequately reinforced or digitally equipped to accommodate increasing shares of decentralized renewable generation.

This can lead to network congestion, curtailment of renewable energy production, long waiting times for connection approvals, and in some cases additional technical requirements imposed on project

developers. These constraints are often particularly pronounced in rural or economically less developed regions, where grid infrastructure investment has historically been limited.

In addition, the deployment of enabling technologies such as smart metering systems, advanced monitoring tools, and digital energy management platforms is essential for the effective operation of RECs. These technologies allow for real-time tracking of energy production and consumption, facilitate transparent and fair internal billing, and enable more sophisticated operational models such as collective self-consumption or dynamic load management. However, in many parts of the region, the rollout of such infrastructure remains incomplete or uneven, which restricts the full functionality and efficiency of energy communities.

Another important aspect is the technical complexity of integration with existing grid operators and market systems. RECs must comply with a wide range of technical standards and regulatory requirements in order to be connected to and operate within national electricity systems.

These include grid stability and safety requirements, metering and settlement procedures, participation in balancing and ancillary service mechanisms, and integration into existing market and billing frameworks. For many community-led initiatives, these requirements are highly complex and require specialised technical and regulatory expertise that is often not readily available at local level. In addition, coordination with distribution system operators can be challenging due to differing interpretations of technical requirements, administrative procedures, and limited experience with community-based energy models. This can result in delays, increased project complexity, and higher transaction costs for REC developers.

Overall, these technical and infrastructural deficits significantly constrain the effective integration of Renewable Energy Communities into existing energy systems. Addressing these barriers is therefore essential not only for enabling new projects, but also for ensuring the scalable and long-term successful operation of RECs across the Danube region.

The Value Proposition: Benefits of Community-Led Energy Transition Socioeconomic Advantages and Local Resilience

Renewable Energy Communities (RECs) make a significant contribution to regional value creation and the strengthening of local resilience. A key characteristic of RECs is the active involvement of citizens, municipalities, and local businesses in renewable energy production and consumption. This local participation helps ensure that financial resources remain within the region rather than flowing to external energy suppliers.

In particular, cooperation with local enterprises strengthens regional economic activity and fosters new forms of collaboration and partnership. Furthermore, energy communities introduce inclusive participation models that enable citizens to engage even without substantial upfront investments. This broadens access to participation and allows the financial benefits generated through renewable

energy production to be distributed more equitably within the community. At the same time, municipalities can reduce administrative burdens and improve efficiency through shared organisational structures, joint resource use, and knowledge exchange.

Another important benefit is the potential reduction in energy costs. Through local energy production and self-consumption, community members can partially satisfy their energy demand independently of external market fluctuations. In addition, community-based structures create opportunities to influence electricity pricing at the local level, contributing to greater price stability and possible long-term savings. Collectively, these factors can also help alleviate energy poverty by improving access to affordable and locally produced energy.

Based on the findings of *O1.1 Strategy* and *D2.1 Engagement Strategy*, the documents examine the role of RECs as drivers of a community-led energy transition in the Danube Region, with particular emphasis on the legal, technical, social, and motivational conditions necessary for their successful development. The analysis demonstrates that RECs provide substantial socioeconomic and environmental benefits by strengthening local resilience, increasing regional value creation, enhancing energy security, and promoting citizen participation in renewable energy generation and consumption. At the same time, the study identifies significant barriers that continue to hinder REC development, including fragmented legal frameworks, administrative complexity, insufficient financial incentives, limited grid access, and low levels of public awareness. These challenges are especially pronounced in countries where REC legislation remains underdeveloped or only partially aligned with the European Union acquis.

Drawing on comparative pilot experiences presented in *D3.2.1* from countries such as Hungary, Croatia, Serbia, Moldova, Slovakia and Germany, the paper highlights the importance of tailored governance models, stakeholder engagement, mentoring schemes, and trust-based awareness-raising approaches. The findings confirm that interactive and locally adapted methods — including peer-to-peer exchange, professional training, study visits, and REC ambassador networks — are more effective in encouraging participation than purely digital communication strategies.

The project findings further emphasise that REC development requires differentiated policy approaches depending on the national context. While countries with more advanced REC frameworks benefit primarily from improving administrative efficiency and scaling existing models, emerging contexts require foundational legal frameworks, capacity building, and targeted financial support mechanisms. Based on these findings, the paper proposes strategic recommendations for establishing supportive legal environments, strengthening social inclusion, improving operational conditions, and enhancing the long-term sustainability of RECs throughout the Danube Region. Overall, the research demonstrates that community-led energy initiatives can play a central role in accelerating the renewable energy transition while simultaneously fostering democratic participation, regional cooperation, and social cohesion.

Environmental Impact and Climate Mitigation

Renewable Energy Communities play a key role in accelerating the expansion of renewable energy across the energy system. By enabling the active participation of local actors in energy generation, they support the deployment and diffusion of technologies such as photovoltaics, wind power, biomass, and, in some cases, small-scale hydro or hybrid systems. In many regions, RECs act as important drivers of decentralised investment, helping to mobilise local capital and social acceptance for renewable energy projects. Projections and early implementation experiences indicate a continued and significant increase in installed renewable capacity—particularly in the photovoltaic sector—where community-based models are expected to contribute substantially to future growth.

Through the increased deployment of renewable energy sources, energy communities make a direct contribution to greenhouse gas emission reductions. By replacing fossil fuel-based electricity and heat generation with locally produced renewable energy, RECs support a sustained decrease in CO₂ emissions and contribute to the achievement of national and European climate targets. Beyond direct emission reductions, they also foster a broader structural transformation of the energy system toward a more decentralised, low-carbon, and renewable-based configuration.

In addition, RECs can influence energy consumption behaviour in a positive and lasting way. As members are directly involved in both the production and consumption of energy, they tend to develop greater awareness of energy use and efficiency. This increased engagement often leads to more conscious consumption patterns and improved energy management at household and community level. Operational mechanisms such as aligning local consumption with renewable generation profiles, implementing demand-side management, and utilising flexibility solutions further enhance system efficiency and contribute to the optimisation of overall energy use within the community.

In general, renewable energy communities not only accelerate renewable energy deployment and emissions reduction, but also act as catalysts for behavioural change and improved energy efficiency, thereby strengthening both the environmental and systemic performance of the energy transition.

System Benefits and Grid Stability

In addition to their environmental and economic benefits, Renewable Energy Communities (RECs) also generate important systemic advantages for the energy system as a whole. By enabling decentralized generation and local consumption of renewable energy, RECs help reduce the load on supra-regional transmission and distribution infrastructure. Local production combined with self-consumption shortens energy flows, decreases transmission losses, and contributes to relieving congestion in existing grid networks, particularly during peak generation periods.

Furthermore, RECs can actively support grid stability by improving the spatial and temporal balance of energy flows. The integration of decentralised storage solutions—such as battery systems, thermal

storage, or electric vehicle batteries—enables surplus renewable energy to be stored locally and used when demand increases or generation declines. Practical experience from existing projects demonstrates that the combination of local generation and storage not only enhances self-consumption rates but also contributes to overall system stability. In some cases, these integrated approaches also open up additional applications, for example in the provision of sustainable heating solutions or sector coupling between electricity and heat. Innovative operational models, such as the aggregation and coordinated management of flexibility, further strengthen the system-relevant role of energy communities.

By bundling distributed energy resources, managing demand response, and optimising local consumption patterns, RECs can help to mitigate peak loads and reduce stress on the electricity system. This increases overall system efficiency and supports a more balanced utilisation of generation and network capacities. Renewable Energy Communities contribute to the transformation of the energy system toward a more resilient, flexible, and decentralised structure. By combining local generation, storage, consumption, and flexibility management, they act as important enablers of system integration for renewable energy sources and support the long-term stability of the evolving energy landscape.

Social Cohesion

A key and often underestimated benefit of Renewable Energy Communities (RECs) lies in their social impact. By actively involving citizens, municipalities, and local stakeholders in energy-related decision-making and project development, RECs foster civic engagement and strengthen social cohesion at the local level. The joint planning, implementation, and operation of energy projects create new forms of cooperation, shared responsibility, and identification with regional development goals.

A particularly important effect is the increased acceptance of renewable energy infrastructure and the broader energy transition. Because decisions within energy communities are made in a democratic and participatory manner and because members directly benefit from the outcomes, willingness to support renewable energy expansion tends to increase significantly. This participatory approach helps to reduce societal resistance to renewable energy projects and facilitates the implementation of transformation measures at the local and regional level. Furthermore, energy communities promote transparency, empowerment, and inclusive participation within the energy system. Members are typically given the opportunity to engage in decision-making processes, influence investment priorities, and actively shape the strategic direction of the community. This democratic governance structure strengthens trust in energy policies and contributes to a more resilient and socially embedded energy transition over the long term.

In this context, it is also important to highlight the role of energy efficiency as a complementary benefit and strategic pillar of RECs. Beyond its relevance for addressing energy poverty, energy efficiency measures contribute more broadly to reducing overall energy demand and lowering energy costs for households, municipalities, and other local actors involved in or supporting energy communities.

Investments in building insulation, efficient heating and cooling systems, smart energy management, and behavioural changes can significantly enhance the economic performance of RECs while simultaneously reducing pressure on local energy systems. This integrated perspective—combining renewable energy generation with efficiency improvements—strengthens both the financial viability and the social impact of energy communities. RECs can not only contribute to decarbonisation and energy system transformation, but also act as important drivers of social innovation, democratic participation, and local economic resilience, while energy efficiency further amplifies these benefits across all participating actors.

Models, Solutions, and Practical Guidance for REC Establishment Operational and Governance Models (Best Practices, e.g. Association)

Selecting an appropriate organisational and governance structure is a critical success factor for Renewable Energy Communities (RECs). In practice, certain legal forms—particularly associations and cooperatives—have proven to be especially suitable across different national contexts. Associations typically offer a relatively simple and low-threshold entry model, making them well suited for initiating community engagement and enabling broad participation at an early stage. Cooperatives, on the other hand, tend to provide stronger economic structures, clearer investment frameworks, and greater scalability, which can be advantageous for long-term development and the expansion of energy projects.

However, regardless of the chosen legal form, the effectiveness of a REC largely depends on the quality of its internal governance arrangements. Successful energy communities are typically characterised by transparent and well-defined decision-making processes, clearly assigned roles and responsibilities, and strong mechanisms for member participation and accountability. Democratic governance principles are particularly important in maintaining trust and ensuring long-term engagement of members and stakeholders. In addition, cooperation with local stakeholders—such as municipalities, local businesses, energy agencies, and technical experts—can significantly strengthen the institutional capacity of RECs. Such partnerships contribute to professionalisation, improve access to technical and administrative expertise, and facilitate smoother project implementation. They also help bridge the gap between grassroots initiatives and formal energy system requirements, thereby increasing the overall effectiveness and sustainability of energy communities.

A well-designed combination of an appropriate legal structure, robust governance mechanisms, and strong local partnerships is essential for ensuring the successful establishment, operation, and long-term resilience of Renewable Energy Communities.

Innovative Financing Mechanisms for Sustainability (Crowdfunding, Loans)

Alternative financing models are playing an increasingly important role in enabling the development and scaling of Renewable Energy Communities (RECs) across the Danube region. In particular, citizen participation mechanisms—such as community shares, cooperative investments, and crowdfunding

schemes—can significantly strengthen the local capital base. At the same time, these approaches enhance social acceptance and ownership, as local stakeholders become directly involved in the financing and benefits of renewable energy projects. In addition to citizen-based financing, debt instruments such as bank loans and cooperative credit lines are essential, especially for larger or more capital-intensive investments. In practice, many successful REC projects rely on a combination of different funding sources, including public subsidies, private capital, and citizen contributions. This diversified financing structure helps to distribute financial risks more effectively, improve bankability, and close potential funding gaps.

In the longer term, the economic sustainability of energy communities depends on the stability and predictability of their revenue models. Core income streams typically include savings from collective self-consumption, revenues from the sale of surplus electricity to the grid, and, in some cases, additional services such as flexibility provision or local energy services. The viability of RECs is therefore closely linked to regulatory frameworks, market design, and electricity price structures, which together determine the overall attractiveness and resilience of their business models. The combination of diversified financing instruments and stable, well-designed revenue mechanisms can be seen as crucial for ensuring the long-term financial sustainability and scalability of Renewable Energy Communities.

Policy Recommendations based on NRGCOM experience findings

Based on the analytical work, pilot implementation experience, and transnational exchange developed within the NRGCOM project (Mainly O1.1. Strategy, 3.4.1. Efficiency Report, O2.2. Pilot activities and 1.3.1. Collection of best internal operational governance practices), the further advancement of Renewable Energy Communities (RECs) in the Danube Region depends above all on the creation of clear, stable, and enabling framework conditions. Across the region, progress is strongly influenced by the maturity of national legal frameworks, while remaining inconsistencies in definitions, fragmented provisions, missing secondary legislation, and regulatory uncertainty continue to hinder both the establishment of new RECs and the effective operation of existing ones. A key policy priority is therefore to establish transparent and harmonised legislation that clearly defines the role, rights, obligations, and permitted activities of RECs, while ensuring fair, non-discriminatory access to energy markets, grid infrastructure, and energy-sharing mechanisms for citizens, municipalities, SMEs, and other eligible actors. Such frameworks should ensure non-discriminatory and fair access to energy markets, while also providing legal certainty for all involved actors, including citizens, municipalities, and small enterprises.

At the same time, the simplification and standardisation of administrative procedures is essential. Complex and heterogeneous approval processes should be streamlined through harmonised requirements, clear guidelines, and, where possible, digitalised procedures. The establishment of centralised “one-stop shop” structures or dedicated contact points can significantly reduce bureaucratic barriers, shorten implementation timelines, and support project developers throughout the entire lifecycle of a REC. A further strategic priority is capacity building and knowledge transfer. The project NRGCOM demonstrated that many emerging RECs require tailored support in legal

structuring, technical planning, business model development, governance, and financial preparation as can be seen in Output 2.2. Practical, data-driven mentoring and targeted trainings proved more effective than generic theoretical guidance, while advisory services, templates, and accessible guidance materials were repeatedly identified as necessary tools for founders and operators. These accessible guidance materials can help bridge existing knowledge gaps. In addition, the systematic exchange of best practices between countries and regions can enhance institutional learning and contribute to the professionalisation and scalability of energy communities across the Danube region.

In the financial domain, improving access to funding and developing innovative financing mechanisms is crucial. A balanced combination of public funding schemes, European support instruments, private sector participation, cooperative financing models, and citizen-based investment approaches can help reduce upfront investment barriers and improve the economic viability of projects. Furthermore, tailored financial instruments that reflect the specific characteristics of RECs can play an important role in mobilising local investment and strengthening long-term sustainability. In parallel, continued investment in grid infrastructure and the integration of RECs into electricity markets is essential to overcome existing technical constraints. Modernised and digitalised distribution grids, increased flexibility, and improved interoperability between community-based systems and existing market structures are key prerequisites for enabling the large-scale deployment of RECs. Ensuring that RECs are properly integrated into balancing mechanisms, metering systems, and market participation schemes will further enhance their functionality and contribution to the energy system.

In parallel, continued investment in technical infrastructure and market integration is indispensable. The project's pilot actions confirmed that the large-scale development of RECs requires modernised and digitalised distribution grids, reliable smart metering, energy management systems, and effective integration into balancing, settlement, and market participation schemes. Quarter-hourly metering, data quality, and digital tools were identified as critical enablers of efficient operation, while outdated infrastructure, limited grid capacity, and complex DSO procedures remain major bottlenecks in many countries. Ensuring interoperability between community-based systems and existing energy market structures is therefore a precondition for the broader deployment and long-term efficiency of RECs, see which can be seen in the activity D3.4.1. "Efficiency report of the targeted energy communities".

Finally, the successful promotion and scaling of Renewable Energy Communities requires a coordinated and multi-level approach that addresses legal, administrative, financial, technical, governance, and social dimensions simultaneously. NRGCOM also showed that RECs are not merely technical energy projects, but socio-technical systems whose success depends on citizen trust, stakeholder participation, inclusive governance, and long-term community engagement. Only through such integrated action can RECs fully realise their potential as drivers of a decentralised, democratic, socially inclusive, and sustainable energy transition in the Danube Region.

Dissemination, Capitalization, and Transnational Strategy (White Paper, Ambassadors, Pilot Projects)

Dissemination and capitalization constitute a central pillar of the NRGCOM project's strategy for ensuring the long-term uptake, transferability and replication of Renewable Energy Communities (RECs) across the Danube Region. The White Paper itself serves as the project's key capitalization output, integrating the strategic foundations developed under Output 1.1 with the evidence generated through awareness-raising actions, ambassador activities and pilot implementations, and translating them into a coherent framework for future policy and practice. In this context, the REC Ambassador Network (A.2.1) has played an essential role as a transnational mechanism for knowledge transfer, stakeholder mobilisation and public communication, bringing together experts from public administration, academia, civil society, municipalities, energy agencies and the private sector, and enabling both national and cross-border exchange through events, workshops, media activities and dedicated online platforms. At the same time, pilot actions have provided the empirical basis for dissemination by demonstrating how REC models can be tested and adapted under diverse legal, technical and socio-economic conditions. The White Paper itself represents a key capitalization output, consolidating the project's strategic analyses, pilot experiences, research findings, and policy recommendations into a practical and transferable framework for both the creation of new RECs and the more sustainable functioning of existing ones. It builds directly on the project's earlier strategy work and on the results of pilot actions implemented under Activities 3.2 and 3.4, thereby translating tested approaches and evidence into guidance of lasting relevance for policymakers, municipalities, energy agencies, civil society actors, and potential REC founders.

The mentoring pilots in Hungary, Croatia, Serbia, Moldova and Germany confirmed that the maturity of the legal framework is the decisive factor for implementation progress, while also showing that structured mentoring, stakeholder engagement and feasibility-based planning are transferable methods across contexts (D3.2.1.) In parallel, the technological pilots in Austria, the Czech Republic, Slovakia and Slovenia validated the ETMEC software and readiness methodology, generating practical evidence on how digital tools and harmonised assessment approaches can support more efficient and scalable REC development (D.3.4.1).

Together, these elements form a transnational dissemination and capitalization strategy that not only communicates project results but also embeds them in durable cooperation structures, ensuring that the White Paper functions as a practical reference for policymakers, practitioners and future REC founders throughout the region.

A central capitalization mechanism of the project was the Renewable Energy Community Ambassador Network, established to strengthen awareness, knowledge transfer, and stakeholder engagement across participating countries (A.2.1). This network brought together a broad range of experts from public administration, academia, municipalities, civil society, energy agencies, and the private sector, who acted as multipliers, mentors, and advocates of the REC concept. Through national and transnational cooperation, ambassadors contributed to public events, trainings, workshops, conferences, podcasts, media appearances, study visits, and policy dialogue, while also supporting the

exchange of expertise through dedicated online channels, including the LinkedIn expert group and the NRGCOM project website. The ambassador model proved particularly valuable in bridging the gap between technical and legal complexity on the one hand and the practical concerns of citizens, municipalities, and SMEs on the other, thus enhancing both the visibility and credibility of REC initiatives.

Pilot actions constituted the second major pillar of the project's transnational strategy. The mentoring pilots implemented in Hungary, Croatia, Serbia, Moldova, and Germany tested the practical applicability of the jointly developed REC mentoring method in highly diverse legal, institutional, and market settings (D3.2.1.) These pilots demonstrated that the maturity of the legal framework remains the most decisive factor in determining implementation progress, while also confirming the transferability of structured mentoring approaches based on stakeholder engagement, feasibility analysis, governance preparation, and practical roadmaps.

The dissemination strategy of NRGCOM further relied on broad and diversified outreach activities under Specific Objective 2, aimed at increasing public understanding of RECs and motivating participation in community-led energy initiatives. More than 40 awareness-raising events, 31 professional trainings, and 9 fairs were organised, complemented by handbooks, videos, podcasts, brochures, social media communication, webinars, and study visits Output. These activities reached thousands of participants and demonstrated that face-to-face formats, peer learning, and trust-based communication consistently outperform stand-alone digital information in generating both awareness and concrete follow-up interest. The project also confirmed that approaches must be tailored to national and regional contexts, as countries across the Danube Region differ significantly in legal readiness, social familiarity with the REC concept, and institutional capacity.

From a transnational perspective, NRGCOM highlights that no single dissemination or support model can be applied uniformly across the region. Instead, effective capitalization requires differentiated pathways: in emerging contexts, priority must be given to awareness raising, confidence building, and legal clarification; in more advanced contexts, the focus shifts toward improving governance quality, operational efficiency, market integration, and scaling. Transnational knowledge exchange, study visits, pilot cooperation, and ambassador-led networking therefore played a decisive role in enabling less experienced countries to benefit from the practical experience of frontrunners such as Austria, Germany, Slovenia, and Slovakia. In this way, dissemination and capitalization under NRGCOM have not only supported the visibility of project results, but also laid the foundation for their continued use, adaptation, and replication beyond the project lifetime.

Key executive messages

- RECs are not just technical projects; they are socio-technical systems requiring coordinated governance, finance, infrastructure and citizen engagement
- Legal and regulatory maturity is the most decisive factor in implementation success

- Data-driven feasibility analysis and early DSO engagement are critical for reducing delays and improving viability
- Associations and cooperatives are often the most accessible starting points, but legal form must match context
- Smart metering, digital energy management and clear internal rules and framework are essential for efficient operation
- Trust-based communication, ambassadors and peer examples are among the most effective ways to mobilise participation
- Inclusive design is necessary to ensure RECs contribute to affordability, energy poverty reduction and a just transition

Part B: National Compendium of REC Status and Implementation in Romania

National Energy Profile

Romania ranks 16th in the Climate Change Performance Index (CCPI)¹. The country receives high ratings in GHG Emissions and Energy Use and low in Climate Policy and Renewable Energy.

The CCPI country experts recognise several positive developments since the Long-Term Strategy (LTS) was adopted in late 2023. For instance, the potential for offshore wind generation in the Black Sea has finally been acknowledged, with major policy changes now planned to account for this potentially transformative renewable expansion. The National Recovery and Resilience Plan (NRRP) includes a coal phase-out date and obligates the government to accelerate the rollout of solar and wind nationwide. Nevertheless, the experts highlight the deficits still shaping the character of the LTS, with current targets still allowing GHG emissions of 3 MtCO₂eq in 2050.

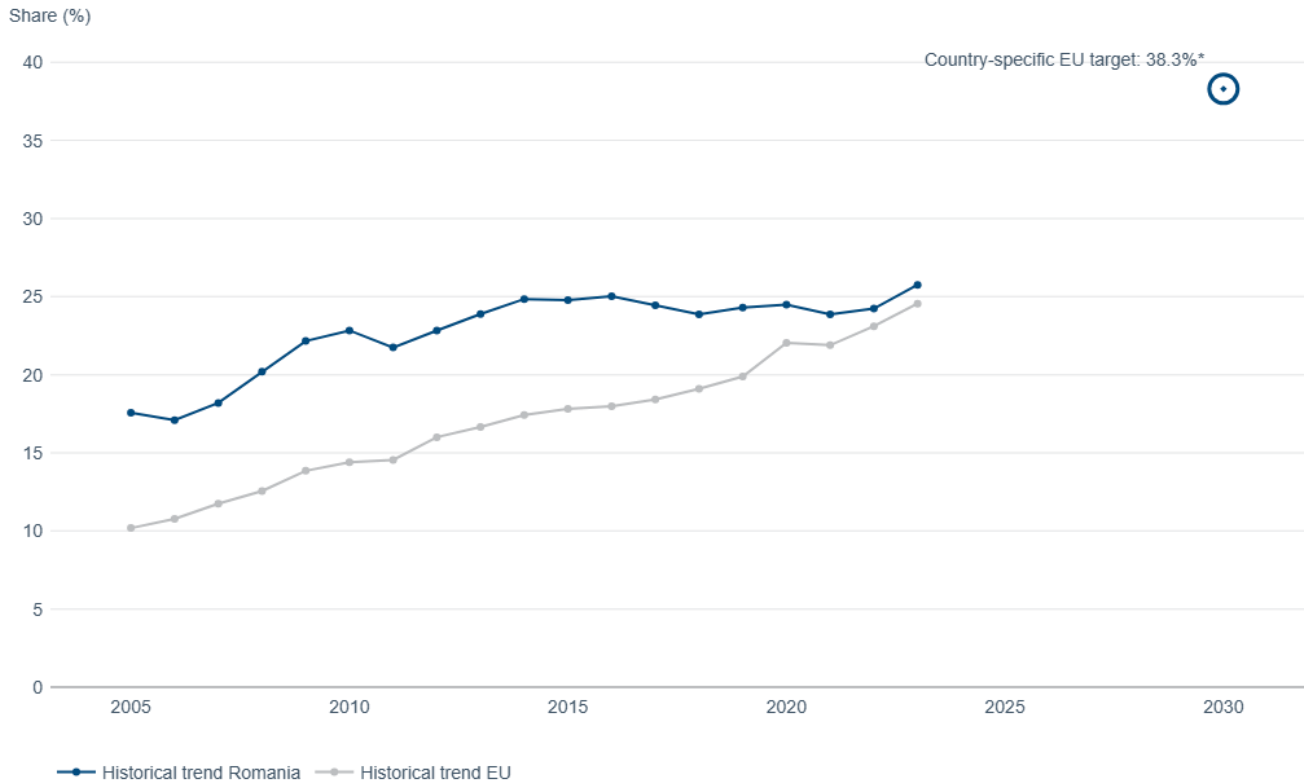
Romania has set the objective of achieving a 30.7% share of energy from renewable sources in gross final energy consumption by 2030, considering national circumstances, compared with the shares of 24.4% achieved in 2020 and 23.6% achieved in 2021. The latest available data show an increase to 25.8% in 2023².

Romania's energy mix still relies heavily on fossil fuels, mainly oil and gas. A 2032 phase-out goal has been set for coal. No phase-out dates have been set for gas and oil. The country plans to use gas as a transition fuel; therefore, many investments in fossil gas are still planned through various strategic or programmatic documents.

¹ <https://ccpi.org/country/rou/>

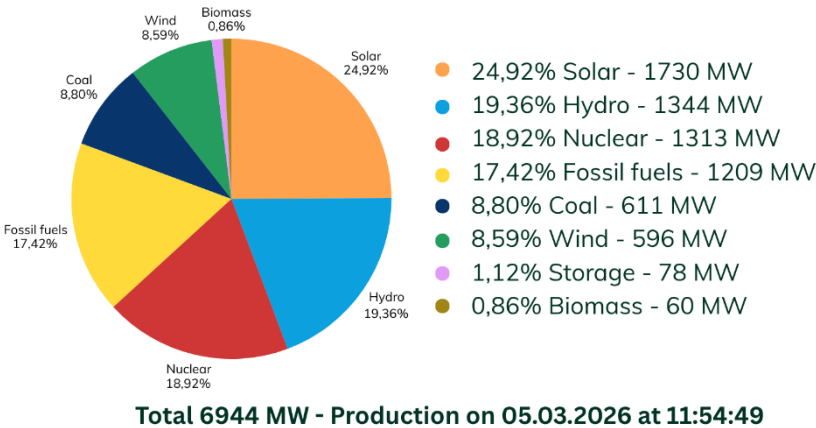
² <https://www.eea.europa.eu/en/europe-environment-2025/countries/romania/renewable-energy-sources>

Share of renewable energy in final energy consumption



Hydropower is currently Romania's main source of renewable energy, representing approximately 34% of final electricity consumption. In 2023, the installed capacity of wind power plants was 3026,91 MW, or 16% of the net installed capacity, but contributed only 13% to total electricity production, due to variability. At the beginning of 2024, the net installed capacity of solar sources was 1624 MW, up from 1185 MW in 2023. In 2023, only 0.69% of the electricity produced in Romania came from biomass,

bioliquids, biogas, waste and/ or waste and sludge fermentation gases, totalling 118 MW of installed capacity. The use of geothermal energy is still limited in Romania³.



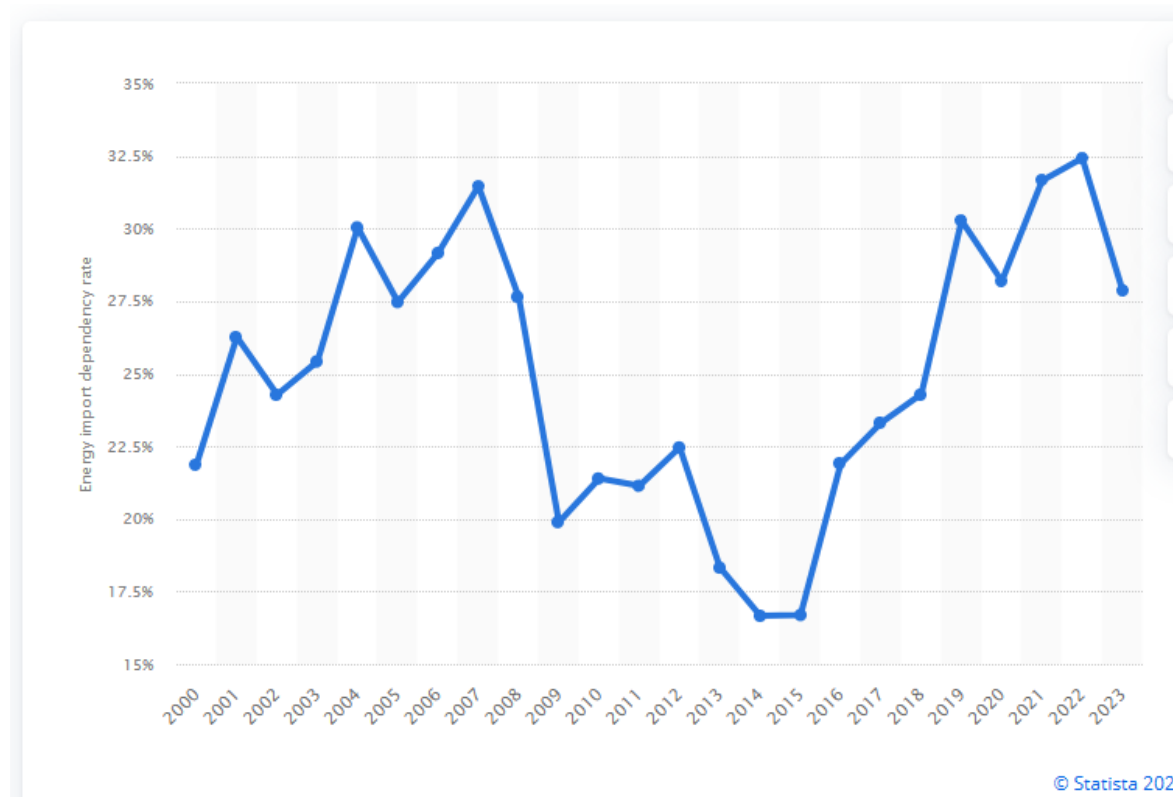
The Renewable Energy Directive provides citizens who produce their own renewable energy with a clear right to consume, store or sell their generated energy. Small-scale installations for the production of electricity from renewable sources consisted of approximately 40000 prosumers in 2022 (higher numbers for 2026⁴, almost 300.000 prosumers), with an installed capacity of 417 MW in 2022 (estimated at 3.400 MW for 2026), which is rather low compared with that in other Member States with similar economies.

³ <https://www.eea.europa.eu/en/europe-environment-2025/countries/romania/renewable-energy-sources?activeTab=658e2886-cbf-4c2f-a603-061e1627a515>

⁴ <https://asociatiaprosumatorilor.ro/situatia-reala-a-prosumatorilor-si-a-comunitatilor-de-energie-din-romania/>

Dependency rate on energy imports in Romania from 2000 to 2023⁵

In 2023, energy imports accounted for nearly 28%⁶ of Romania's total energy needs. The import dependency rate, which is calculated as net imports of energy divided by gross available energy, was at nearly 22% back in 2000.



Romania became a net electricity importer in recent years⁷. An analysis of Transelectrica's data⁸ for the whole of 2025 show that Romania was a net importer for approximately 72% of the time. In the data set analyzed, approximately three-quarters of the time shows consumption higher than domestic production, a difference covered by cross-border exchanges. On average, Romania needed about 444 MW to supplement from outside. Beyond the fact that Romania imports frequently, it is worth noting that we import in a way that follows very clear patterns. Significant import episodes are not spread evenly throughout the calendar, but occur almost exclusively in the evening hours, when consumption rises rapidly and solar production disappears almost completely.

Trade balance⁹ - In 2024, Romania exported a total of \$693M in electricity, primarily to Hungary, Ukraine and Moldova. During the same year, Romania imported \$1.56B in electricity, mainly from Hungary, Bulgaria and Serbia.

⁵ <https://www.statista.com/statistics/691184/dependency-on-energy-imports-in-romania/>

⁶ <https://www.destatis.de/Europa/EN/Country/EU-Member-States/Romania>

⁷ <https://www.energynomics.ro/en/when-the-wind-blows-romania-imports-less-the-lesson-of-2025>

⁸ SENGrafic

⁹ <https://oec.world/en/profile/bilateral-product/electricity/reporter/rou>

Romania is partially self-sufficient in **gas**, but still structurally dependent on imports for peak demand. In 2021, Romania was the EU country least dependent on natural gas imports¹⁰. The rate of dependence of the European Union on natural gas imports decreased slightly in 2021, to 83%, from 84% in 2020, but Romania is the member country with the lowest dependence on natural gas imports (24%), according to data released by Eurostat. Romania's gas imports increased by 75% in 2025¹¹ compared to 2024. A reduction trend is expected, with a more pronounced pace around 2027 (minus 6%), in line with the advance in production, through the entry into operation of new capacities, but also taking into account the maintenance of transit to foreign markets.

Legal Framework

Romania's legal framework for Energy Communities is currently in a phase of active development and alignment with EU legislation. Romania has formally adopted the key EU definitions of CECs and RECs through Government Emergency Ordinance (GEO) no. 143/ 2021 and 163/2022, which transpose the provisions of the Electricity Market Directive (EU) 2019/ 944 and the Renewable Energy Directive (EU) 2018/2001 (RED II). More recently, GEO no. 59/ 2025 was adopted to address gaps in the initial transposition and to incorporate elements of the revised Renewable Energy Directive (RED III). While these legislative steps establish a clear legal recognition of ECs, their practical implementation remains incomplete, as several aspects depend on secondary legislation that is still under development. Complementary measures, such as GEO no. 92/ 2024 establishing a network of One-Stop-Shops, aim to support stakeholders by providing information and technical assistance, including for the creation and operation of ECs. However, certain structural elements, most notably a national register of Energy Communities, are still pending, with implementation expected as soon as possible.

Romanian law requires ECs to operate as legal entities, while allowing flexibility in the choice of legal form, provided that core EU principles are respected. In particular, the selected structure must enable democratic governance, ensure effective control by members or shareholders and align with the social and environmental objectives specific to ECs. Both newly established entities and pre-existing organizations may qualify, as long as they adapt their statutes and governance arrangements to meet these requirements.

The legislation distinguishes between for-profit and non-profit legal forms that may be used to establish ECs. Eligible for-profit entities include Limited Liability Companies, Joint Stock Companies, Cooperatives, European Cooperative Societies with limited liability and Small and Medium-Sized Enterprises. Non-profit options include Associations, Foundations, Federations, Local Action Groups and Social Enterprises. Each legal form presents distinct implications for governance and operation. Cooperatives and Associations are generally best aligned with the principle of "one member, one vote," thereby facilitating participatory and democratic decision-making. By contrast, corporate forms such as Limited Liability Companies or Joint Stock Companies offer greater operational flexibility but may pose challenges in ensuring inclusive governance structures. Non-profit entities tend to prioritize

¹⁰ <https://www.energynomics.ro/en/romania-is-the-eu-country-least-dependent-on-natural-gas-imports>

¹¹ <https://www.energynomics.ro/en/romania-gas-imports-increased-by-75-in-2025>

community-oriented objectives, although they may face more complex administrative and bureaucratic requirements.

Overall, Romania’s legal framework provides a broad and flexible foundation for the development of Energy Communities, but it remains a work in progress. Ongoing regulatory refinements and the adoption of secondary legislation will be essential to ensure full operationalization and to create a stable and supportive environment for community-led energy initiatives.

Institutional Landscape

The institutional framework supporting Energy Communities in Romania involves a range of national authorities, regulatory bodies, local actors and civil society organizations.

Institution	Type	Role
Ministry of Energy	National authority	Main authority for Energy Communities legislation and policy; aligns national law with EU directives; manages financial support programs; coordinates a dedicated working group including public authorities, regulators and civil society.
National Energy Regulatory Authority	Independent regulator	Creates and enforces rules; sets technical standards; issues licenses; manages grid access, tariffs and market participation; responsible for secondary legislation and developing the national Energy Communities Register.
Ministry of Environment, Water and Forestry	National authority	Supports renewable energy projects through funding and green subsidies; promotes sustainability and pollution reduction.
Ministry of Investments and European Projects	National authority	Manages Romania’s access to EU and national recovery funds; funding available to prosumers and Energy Communities.
Ministry of Development, Public Works and Administration	National authority	Coordinates One-Stop Shops for energy efficiency and renewable energy; provides guidance for individuals, companies, and communities to access funding and technical advice.
Transmission System Operators (TSOs) Transelectrica S.A	Technical operator	Ensure Energy Communities can connect to the electricity grid and manage electricity flows.
Distribution System Operators (DSOs)	Technical operator	Manage distribution network access and local electricity flows.

Electrica Distribuție Enel E-Distribuție România CEZ Distribuție E-ON Distribuție		
Local authorities	Local government	Support permitting, land-use planning and can initiate or support Energy Community projects, especially in rural or smaller municipalities.
Civil society Energy Coalition, Energy Cooperative, Greenpeace Romania, WWF Romania, Energy Cities Romania, Between Neighbours	NGOs	Raise awareness, encourage participation, and support local renewable energy initiatives.

Maturity Level and Ecosystem (Established, Emerging, Nascent)

Romania's Renewable Energy Communities (RECs) are currently at a nascent stage of development. Although the EU has encouraged Member States to accelerate community-based renewable energy initiatives, Romania has been slow to translate this ambition into functioning, scalable models, primarily due to the absence of a regulatory framework that enables energy sharing between consumers.

This early stage reflects both regulatory and practical barriers. While Romania has transposed parts of the EU Renewable Energy Directive (RED II), the national framework remains incomplete and restrictive, covering mainly electricity from photovoltaic systems and not yet enabling the broader range of activities envisioned at the EU level. As a result, most initiatives remain exploratory, with local actors still navigating unclear procedures, limited support mechanisms and insufficient technical guidance.

The ecosystem shows early signs of mobilization, driven by EU funding programs, local pilot initiatives and increasing public interest, but lacks the structural elements of an emerging or established market. There is not yet a critical mass of functioning communities, nor a stable pipeline of projects moving from concept to implementation.

However, Romania's policy environment is expected to evolve and several municipalities and civil society groups are preparing studies, partnership models and early-stage project concepts. With clearer regulation, targeted financial instruments and stronger institutional support, Romania could transition from a nascent to an emerging ecosystem within the next few years.

Analysis of Specific National Barriers

Legislative and Administrative Obstacles

Romania's regulatory framework remains incomplete and restrictive, creating significant barriers for citizens, municipalities and SMEs wishing to establish or operate RECs. The absence of clear rules for energy sharing, governance structures, grid access and financial compensation mechanisms leaves potential community members without the legal certainty needed to invest.

Administrative procedures further complicate the landscape. Stakeholders face fragmented institutional responsibilities, slow permitting processes and inconsistent interpretations of the law. The lack of standardized guidelines, one-stop-shop support or dedicated administrative capacity means that even motivated local actors struggle to navigate approvals, grid connection requests and compliance requirements. Additionally, ongoing debates and delays in Parliament, such as unclear provisions for prosumers and shifting capacity thresholds, create regulatory instability that discourages long-term planning.

Market and Infrastructure Hurdles

Romania's RECs face significant market-related challenges that slow down their development and limit their ability to scale. The national energy market is still dominated by large, centralized producers and suppliers, leaving little room for community-driven initiatives to participate competitively. Access to financing remains limited, with few tailored financial instruments, guarantees or incentives designed specifically for RECs. At the same time, fluctuating energy prices and the absence of long-term, predictable remuneration schemes make it difficult for communities to build viable business models or attract investment. Potential members lack awareness of the economic benefits of collective energy action, which further reduces demand and slows market uptake.

Infrastructure constraints add another layer of complexity. Romania's distribution grids, especially in rural and peri-urban areas, often lack the capacity to integrate new renewable generation or support bidirectional flows of electricity. Grid operators face their own resource limitations, resulting in slow or inconsistent processing of connection requests. Digital infrastructure for metering, monitoring and managing shared energy flows is still underdeveloped, while smart metering coverage remains uneven. Without modernized grid systems and clear operational protocols, Energy Communities cannot fully participate in energy sharing, flexibility services or local balancing.

Financial and Capacity Gaps

RECs in Romania face significant financial barriers that limit their ability to launch and sustain projects. Access to capital is constrained by the lack of dedicated funding instruments, guarantees or low-interest loans tailored to community-led initiatives. Most potential members struggle to secure upfront investment for renewable installations, feasibility studies or digital infrastructure. Existing national programs tend to prioritize individual prosumers rather than collective models, leaving Energy Communities without predictable financial support or long-term revenue mechanisms. This uncertainty makes it difficult to build bankable projects and discourages private investors from engaging with community-driven energy models.

Capacity gaps further stress these financial challenges. Many local authorities, cooperatives and citizen groups lack the technical, legal and organizational expertise needed to design, manage or operate an Energy Community. There are few advisory services, standardized templates or training programs to guide communities through project development, permitting, governance or grid integration. Distribution system operators also face their own capacity constraints, which slow down technical assessments and connection procedures. Without targeted capacity-building efforts and accessible technical assistance, Romania's Energy Communities remain dependent on external consultants and fragmented knowledge, limiting their ability to mature.

Case Studies and Pilot Capitalization

Best Practice Example (National)

The **Flamingo 50 community**, managed by Flamingo Energy, includes 27 active members and more to join. Originating from new residents, the initiative emphasizes collaboration, with 25% funded by the Green House program and 75% privately financing photovoltaic panels. Most residents work from home, leading to high daytime energy use, and 97% rely on electricity for heating, indicating strong potential for achieving energy goals.

To meet these demands, a peri-urban Energy Community like Flamingo 50 would need to install photovoltaic panels with a total capacity of 0,4 MW, requiring an area of approximately 5.000 square meters (0.5 hectares) and an estimated investment of 252.000 EUR.

The Flamingo 50 Energy Community offers valuable lessons for other initiatives by emphasizing the importance of social motivations over solely ecological goals. In Romania, the focus on community resilience and shared benefits has fostered strong engagement among residents, uniting them around collective action. The initiative's non-profit framework ensures that energy goals prioritize long-term well-being over short-term profits, highlighting the effectiveness of a community-focused model. Additionally, Flamingo 50 demonstrates that renewable energy solutions, such as photovoltaic panels, can deliver both financial and environmental benefits. The community aims for energy independence, showcasing the long-term cost savings achievable through local energy solutions. This approach also addresses broader challenges such as energy security and sustainability, particularly in remote areas.

Între Vecini/ Between Neighbours: A model for energy and community building

In 2021, Între Vecini launched a project transforming an urban block into an energy-positive community through local collaboration. The homeowners' association received a grant to install solar panels on the roof for €5,500, generating an average of 729 kWh per month and reducing energy bills. The initiative has also fostered social connections among residents, with a newly landscaped garden serving as a communal space. Initially met with scepticism, the project gained acceptance, bridging divides within the community. This initiative showcases the synergy between energy generation and social cohesion, serving as a replicable model for other communities to enhance both their energy resources and social bonds.

Since 2016, **Buteni Commune** has thrived under a visionary team led by the mayor. They have secured significant funding for energy projects, including a public lighting modernization funded by Norwegian grants and the successful "Green House Photovoltaic" initiative, which completed 100 of 200 planned installations. These efforts have attracted €720,000 from national programs and €280,000 in local contributions, showcasing the community's commitment to sustainability and effective resource mobilization. The efforts have made a significant impact, with 36% of the commune's energy consumption in 2022 covered by local renewable sources, reducing reliance on external energy. Notably, 77% of the energy produced by households and municipal buildings was surplus, contributing to the national grid and enhancing overall sustainability. Economically, 100 households that adopted solar energy are saving over €100,000 annually on electricity bills, showcasing the financial advantages of local renewable energy.

Results of the NRGCOM Pilot Project

The pilot actions at the national level have helped lay a strong foundation for creating and sustaining Energy Communities in Romania. A thorough analysis of the legal framework clarified existing structures, operational models, and main barriers, while also pointing out ways to improve. This analysis included comparisons and real-life examples, along with input from new initiatives focused on consumer behavior, infrastructure needs and cost efficiency.

Engaging actively with public authorities and national ministries, such as the Ministry of Energy and the Ministry of Environment, Waters and Forests, greatly contributed to overcoming structural barriers. The Ministry of Energy set up a working group on Energy Communities (OER being part of it), which was a key step in developing supportive legislation. Participating in this process, along with creating and sharing policy recommendations, helped address regulatory gaps and improve implementation conditions. These efforts increased dialogue between stakeholders and decision-makers, highlighting the importance of Energy Communities for local energy production and consumption.

At the community level, the pilot actions showed how important awareness, capacity building and accessible tools are for promoting engagement. The results reflect this progress: public events attracted about 65 participants and training sessions included 17 participants from various groups. Outreach efforts expanded the impact, with an educational video gaining hundreds of views and guidance materials reaching at least 25 individuals. A network of 16 national ambassadors also helped promote Energy Communities. Additionally, creating awareness toolkits and communication materials gave project partners practical guidance and resources for citizens, municipalities, and new initiatives. This approach ensures that the knowledge and experience gained from the pilot actions can continue to support the growth of Energy Communities after the project ends.

Policy recommendation for Energy community development based on NRGCOM project experience

Based on the NRGCOM project, a key policy priority for developing Energy Communities is adopting the necessary secondary legislation and implementation measures to support their practical operation. Although the national legal framework has been significantly improved through the transposition of relevant EU provisions and the formal recognition of Energy Communities, important

regulatory gaps still exist. Additionally, the absence of a regulatory framework for energy sharing among community members hinders the realization of one of the main benefits outlined in EU legislation. Therefore, policymakers should prioritise the adoption of secondary legislation, establish clear procedures and responsibilities for relevant market participants, and enable energy-sharing mechanisms to fully unlock the potential of citizen-led energy initiatives.

Country specific recommendations

1. Adopt ANRE's pending secondary legislation to operationalize procedures for grid connection, energy sharing, metering and registration.
2. Standardize administrative procedures and ensure equal treatment for all legal forms: Cooperatives, Associations, Foundations and SMEs.
3. Promote democratic governance principles such as "one member, one vote" across both profit and non-profit entities. Strengthen participatory governance requirements and ensure access for vulnerable households.
4. Introduce flexible grid and network tariffs that recognize the system and community value of distributed generation.
5. Enable Virtual Net Metering for energy sharing among dispersed members and streamline permitting via single electronic platforms.
6. Support local authorities and NGOs with training, technical guidance and funding to initiate and manage projects.
7. Individual prosumers benefit from compensation schemes and legal gaps, making Energy Community participation unattractive. To address this, link access to non-reimbursable renewable energy funding to Energy Community involvement and adjust regulations to prevent individual profit-seeking from undermining community goals.
8. Coordinate with TSOs and regional DSOs to ensure safe grid connections, stable electricity flows and participation in balancing markets.
9. Support long-term infrastructure upgrades to accommodate distributed generation from community projects.

References

- European Commission (2019): *Clean Energy for All Europeans Package*
- Directive (EU) 2018/2001 (RED II): Renewable Energy Directive
- Directive (EU) 2019/944: Electricity Market Design
- European Biochar Certificate (EBC), <https://www.european-biochar.org>

- Energy Community Secretariat (EnC): <https://www.energy-community.org>
- Ehrmann, M., Holstenkamp, L., Becker, T. (2021). Regional Electricity Models for Community Energy in Germany: The Role of Governance Structures.
- Hopps, B. (2024). EU Directives on the internal governance of energy communities and their exclusionary effects. *The Journal of World Energy Law & Business*, 17(3), 147–167.

