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Community Energy in Europe's Energy Transition: Policy Analysis and Implications for Japan

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Introduction

In its 7th Strategic Energy Plan, the Japanese government set a target to increase the share of renewable energy in power generation to approximately 40–50 % by 2040. Although renewable power generation surged after the feed-in tariff (FIT) system was introduced in 2012, disputes with local communities have also increased. Local communities have expressed concerns regarding the impact of renewable energy development on the environment, the landscape, and disaster risk management. These issues became especially serious when mega-solar power projects were planned, or when the inappropriate installation or maintenance of small-scale solar power systems was discovered, a problem stemming from previously lenient regulations. In order to support the “coexistence of renewable energy with local communities,” which is essential for deploying renewable energy projects, the government has strengthened relevant policy measures. It is also necessary to develop renewable energy projects that local communities accept and comply with regulations.

Globally, many local communities participate in clean energy projects, known as community energy (in the EU, comparable forms are referred to as energy communities). To accelerate decarbonization toward carbon neutrality by 2050, the energy transition must be promoted at the regional and community levels. In this context, communities that actively participate in clean energy projects are critical to improving public acceptance of renewable energy.

In community energy models, renewable energy projects are expected to benefit local communities rather than negatively impacting them. Some European countries have a long history of utilizing community energy; for instance, co-operatives manage renewable energy projects, while residents invest in clean energy initiatives.

In contrast, Japan has no clear framework for fostering community energy, and projects categorized as community energy remain limited.¹ In 2021, the national government

¹ The Kanto Bureau of Economy, Trade and Industry (METI-Kanto) (2025) highlighted 14 renewable energy projects (wind, hydro, geothermal, and biomass) in the Kanto region that utilize the FIT scheme as exemplary cases of

formulated the Regional Decarbonization Roadmap and has since supported local governments' decarbonization efforts. Although the Renewable Energy Promotion Area Scheme has encouraged the development of renewable energy projects designed to coexist with communities and deliver benefits to the local area, the designated promotion areas remain few.² Japan has limited experience developing community-based renewable energy projects and is still exploring this area. Therefore, learning from community energy cases in other countries is meaningful for Japan as it seeks a viable pathway for renewable energy to coexist with local communities.

This study focuses on community energy in the United Kingdom and the EU, where community energy is actively fostered to accelerate the energy transition. The study examines policies and recent trends that support communities' clean energy projects and analyzes the factors driving community energy. The last section draws implications for addressing the challenge Japan faces in ensuring that local communities accept renewable energy projects.

1. Community Energy: Concepts, Benefits, and Challenges

1.1 Various Forms of Community Energy

Energy projects include not only those undertaken by energy companies but also those carried out by local citizens and communities. While private energy companies primarily pursue economic viability (profit), local citizens and communities participate in clean energy projects with broader goals such as social cohesion, environmental conservation, and climate change mitigation, alongside economic considerations. International Renewable Energy Agency (IRENA) Coalition for Action (2020) has defined community energy as the “economic and operational participation and ownership by citizens or members of a defined community—be it at the village, city or regional level—in a renewable energy project, regardless of the size and scope of the project.”³

Community energy concepts are so diverse that comparing community energy projects

harmonizing renewable energy projects with communities, presenting them as best practices for other local governments and business operators to reference.

² As of March 2026, merely 79 municipalities had designated renewable energy promotion areas (Ministry of the Environment, n.d.).

³ IRENA Coalition for Action defines “community energy as any combination of at least two of the following elements: (1) local stakeholders own the majority or all of a renewable energy project; (2) voting control rests with a community-based organization; (3) the majority of social and economic benefits are distributed locally” (IRENA Coalition for Action, 2020).

in a simple, unified form can be difficult.⁴ Focusing on the term “community”, it is important to note that there are two distinct types: “communities of place,” which consist of residents of the same or neighboring geographic areas, and “communities of interest,” which consist of members who share a common goal, such as an interest in clean energy, without being bound by geography. To cover the various forms of community energy in major European countries, this paper interprets community energy broadly as clean energy projects in which communities participate and hold ownership, including renewable power generation and heat supply, energy storage, and energy conservation.

Community energy projects are managed under a variety of organizational structures. Governance structures, decision-making processes, and lines of accountability differ by legal classification (Table 1-1) (IRENA Coalition for Action, 2020; Caramizaru and Uihlein, 2020). For example, in the case of co-operatives, each member has equal voting rights and participates in decision-making; profits are reinvested in the community, and members share the benefits. In other cases, community energy initiatives include local governments, public energy companies, and private energy companies as participating members.

Various factors encourage local citizens and communities to undertake renewable energy projects. First, support measures such as FIT schemes, subsidies, and tax incentives improve economic viability, thereby facilitating the implementation of renewable energy projects. Because renewable energy projects have the potential to generate revenue for the community, community members see participation as beneficial. Second, the use of renewable energy is expected to enhance energy security. As a domestically available energy source, renewable energy helps improve energy supply stability and self-sufficiency. In off-grid areas, renewable energy deployment also enables access to clean energy. Finally, citizens concerned about environmental and climate change issues view the transition to environmentally friendly and sustainable energy as critical.

Community energy takes diverse forms, depending on available renewable energy resources and infrastructure, and the decarbonization approaches its members seek. Community energy projects previously focused primarily on renewable power generation. In recent years, however, they have expanded to include energy storage and energy conservation, and the role of energy prosumers who serve as both energy producers and consumers has become increasingly important. Beyond renewable power generation (solar, wind, small-scale hydro, and biomass), community energy projects have also encompassed the development of biomass fuel supply systems for district heating as well as efforts to decarbonize road

⁴ There are several terms for energy projects that local communities participate in, not just “community energy.” For example, the EU refers to local citizens and communities participating in clean energy projects as “energy communities” and further distinguishes between “renewable energy communities” and “citizen energy communities.”

transportation through the introduction of electric vehicles and the installation of charging infrastructure.

Table 1-1 Legal Structures for Community Energy

Co-operative	Members jointly own co-operatives to achieve common economic, social, or cultural goals based on the democratic principle of “one member, one vote.” Maximizing return on capital is not a key objective.
Non-profit organization	Members invest in the organization, but do not receive profits.
Association	Associations are private, non-profit organizations established around a common cause. Decision-making power usually stems from the association’s statutes or bylaws and rests with its members. A renewable energy association can take many forms, such as a housing association.
Community trust	Community trusts act as vehicles for broader community benefit. Investment returns are for specific local purposes and are shared with people who cannot invest.
Partnership	Partnerships are formed between individuals or legal entities to achieve a common business purpose. A partnership can take the form of a general partnership (where all partners can be held individually liable for the partnership’s debts) or a limited partnership (where partners who do not participate in management activities have limited liability for the partnership’s debts).
Corporation	Corporations are separate legal entities owned by their shareholders. Shareholders holding more shares have greater voting power and receive the profits as dividends.
Limited liability company	Members benefit from limited liability for the company’s debts while profits are passed directly through to them.

Source: Compiled by the IEEJ based on Table 2, p. 19, IRENA Coalition for Action (2020)

1.2 Benefits and Challenges of Community Energy Projects

(1) Benefits of Community Energy Projects

Community energy brings environmental, social, and economic benefits (IRENA Coalition for Action, 2024). As a social benefit, community energy initiatives have the potential to improve social acceptance of renewable and clean energy technologies by fostering greater understanding and support among residents. When local citizens can participate from the project planning phase, they can engage in discussions regarding how the

project will be carried out, how benefits and risks will be distributed, and how environmental considerations will be addressed. This fosters a democratic and transparent decision-making process, which is critical to building public trust in the project. For example, community energy could settle the so-called NIMBY (not in my backyard) problem. Local communities often oppose large-scale renewable energy projects, such as solar and wind farms, for two main reasons: first, the costs, such as negative impacts on the landscape and noise issues, are seen as outweighing the benefits; and second, residents are unable to participate in the planning process (Interreg Europe, 2022). Encouraging the communities surrounding the project to participate in decision-making from the planning stage will enhance transparency, while clearly articulating the benefits will improve understanding. Together, these measures can help deal with NIMBY issues.

Another social benefit is that, by actively participating in project planning and management, members come to share a sense of responsibility, strengthening solidarity and unity. Furthermore, members can gain knowledge and skills related to clean energy, which is expected to contribute to capacity building.

Community energy also delivers significant economic benefits. If community energy projects can supply affordable renewable electricity, energy costs can be lower than purchasing electricity from traditional utility providers. In some cases, community energy projects even generate revenue by selling surplus electricity. Moreover, reducing energy costs is an effective way to alleviate energy poverty.

In community energy initiatives, project revenues can be reinvested in the local community. For example, revenues can be used to expand the same project or fund other clean energy initiatives. Alternatively, they can be invested in projects that provide social benefits to the community, such as education or infrastructure development.

Community energy projects can help develop the local economy and create jobs when involving local supply chains (Verde and Rossetto, 2020). Additionally, establishing renewable power systems with energy storage at the regional and community levels can help mitigate the impacts of fuel supply disruptions and power outages caused by natural disasters, thereby strengthening energy security.

(2) Challenges of Community Energy Projects

Although community energy has social and economic benefits, its role in the energy market remains limited, and many challenges must be addressed to achieve its widespread adoption.

First, securing financial resources is critical for sound project management. A project's high initial costs make it difficult to cover expenses solely through participants' contributions,

even with government subsidies. Moreover, because community energy projects are typically small in scale, financial institutions may view them as high-risk in operation and finance, which could limit access to funding.

Second, policy support measures are necessary to secure financing and ensure project feasibility. The current energy market structure and legal framework are designed for large-scale power generation projects (IRENA Coalition for Action, 2020). Consequently, typical small-scale community energy projects are disadvantaged due to limited access to the energy market and the power grid. For example, when the renewable power purchase system shifts from a FIT scheme to a bidding system, some conditions become too stringent for small-scale projects to participate in the bidding process. As a result, small-scale community energy projects often struggle to secure buyers for their electricity, making it difficult to generate stable income.

Third, a lack of technical expertise and skilled labor hinders the launch and management of community energy projects. A community alone may not have enough personnel with the specialized knowledge and experience necessary to implement clean energy projects. Some projects failed at the planning stage because of insufficient expertise. Therefore, community energy necessitates cooperation from third-party companies or organizations for technical support.

Fourth, community energy needs to be properly understood. The benefits of active participation in community energy initiatives are not widely recognized, and information on this subject is limited. Unless policymakers understand community energy, it is unlikely to be incorporated into local or national plans and policies, and it will also be difficult to raise public awareness. Communicating knowledge, experiences, and best practices effectively is important to improve understanding not only among local communities but also among policymakers and financial institutions (IRENA Coalition for Action, 2024).

Lastly, fairness should be maintained within the local community. Careful consideration must be given to how project profits are distributed and to what extent residents are involved in project management. If energy project management is not transparent, distrust toward the project may grow. Transparency in decision-making is especially essential for gaining public trust. Furthermore, since high-income individuals with financial resources tend to participate more actively in community energy projects, widening inequality within the local community poses another challenge.

2. The United Kingdom: New Initiatives under the Local Power Plan (LPP)

2.1 Background for Promoting Community Energy Projects

(1) Establishment of Great British Energy (GBE)

To promote decarbonization, energy conservation, and energy security, the United Kingdom (UK) places importance on the role of local communities in clean energy projects.

The UK established the legal framework for reducing greenhouse gas (GHG) emissions under the Climate Change Act 2008 and, in 2019, legally committed to achieving net zero by 2050. In 2021, the UK Government announced the Net Zero Strategy, which outlined policies and plans to meet the 2050 net zero target and set a goal of fully decarbonizing the power system by 2035 (UK Government, 2021).

Following the Labour Party's victory in the 2024 general election, the UK Government further advanced its decarbonization policies and pledged to make the UK a 'clean energy superpower.' The Clean Power 2030 Action Plan, announced in December 2024, aims to generate at least 95% of electricity from clean energy sources by 2030 (UK Government, 2024). To achieve this goal, the plan sets ambitious 2030 targets for renewable power generation capacity: 45–47 GW of solar, 27–29 GW of onshore wind, and 43–50 GW of offshore wind.

In May 2025, the Government established Great British Energy (GBE), a publicly owned company dedicated to clean energy development, and positioned it at the forefront of its mission to make the UK a clean energy superpower. GBE's core objectives are as follows;

First, GBE drives "clean energy deployment across the whole of the UK, as a strategic developer, investor, and owner of clean energy projects," which includes developing new clean energy projects, derisking existing projects, investing in clean energy supply chain projects, and mobilizing private sector investments (UK Department for Energy Security and Net Zero [DESNZ], 2025a).

Second, GBE ensures "that UK taxpayers, billpayers, communities, and the current energy workforce benefit from the clean energy transition by increasing public ownership and community involvement in the development of clean energy projects, and by supporting jobs and economic growth across the UK" (UK DESNZ, 2025a). Specifically, well-paid, high-quality jobs will be created and maintained through GBE-supported projects; the long-term financial self-sustainability will be achieved, and public and community ownership of clean energy assets will be increased to enable reinvestment in support of the transition and for the wider public good; and the long-term growth of the local and community energy sector will be encouraged (UK DESNZ, 2025a).

In sum, GBE plays a critical role in promoting clean energy development at the local level.

Under the “Local Power Plan” described below, GBE will provide financial support for clean energy projects developed in collaboration with local communities.

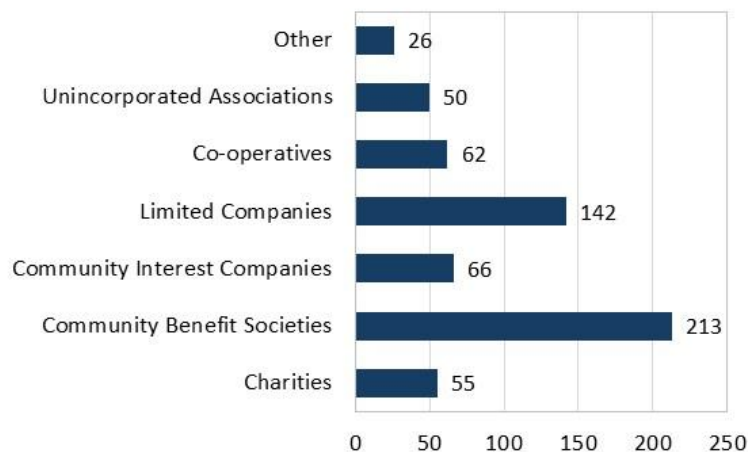
(2) Community Energy Initiatives in the UK

(a) The Current Situation of Community Energy in the UK

As of 2024, the renewable power generation capacity of community energy projects in the UK reached 411 MW (266 MW from solar, 132 MW from wind, 13 MW from hydro, and 0.25 MW from biomass), generating 575 GWh of electricity, which is equivalent to powering approximately 210,000 households annually (Community Energy England, 2025). Additionally, community energy groups, co-operatives, and local governments are planning approximately 1.9 GW of energy projects across the UK (UK DESNZ and GBE, 2026). This planned capacity is equivalent to 3% of the UK’s 2025 renewable power generation capacity of 65.3GW (UK DESNZ, 2026a).

Community energy in the UK is diverse, with 614 organizations engaged in energy projects as of 2024 (Community Energy England, 2025). In terms of organizational structure, Community Benefit Societies were the most common, accounting for nearly one-third of the total; these are organizations that serve the broader interests of the community (Figure 2-1).⁵

Figure 2-1 Community Energy Organizations as of 2024



Note: Community Interest Companies are limited companies that operate to benefit the community.

Source: Compiled by the IEEJ based on p. 4, Community Energy England (2025)

⁵ Community Benefit Societies are classified as a type of co-operative. Under the Co-operative and Community Benefit Societies Act 2014, co-operative members were required to participate directly in the business. However, because most community energy groups sold electricity to the national grid rather than supplying it to members, they did not meet this requirement and were therefore required to register as Community Benefit Societies instead. Consequently, this organizational structure became common among community energy projects (Braunholtz-Speight et al., 2018).

(b) Policy Measures

Two developments explain the driving factors behind community energy deployment in the UK: the liberalization and privatization of energy infrastructure and supply, and the rapid advancement of renewable energy technology. Together, these shifts created opportunities for small-scale energy providers to enter the market (Braunholtz-Speight et al., 2018). Community energy initiatives in the UK began in 1997, when Baywind Energy Co-operative, the first UK co-operative to own wind turbines, raised GBP 2 million to fund its project (Baywind Energy Co-operative, n.d.).

In the 2000s, policies supporting local and community-based renewable energy projects were implemented. In 2002, the UK Government introduced the Renewables Obligation program to expand renewable energy deployment. In particular, the FIT scheme, introduced in 2010 for small-scale renewable energy facilities (less than 50 kW), significantly boosted installed community-owned renewable energy capacity (Verde and Rossetto, 2020). Furthermore, the UK Government provided subsidies, such as the Rural Community Energy Fund, to promote community investment in renewable energy

In 2014, the Community Energy Strategy was formulated to promote the community's active role in energy systems (UK Department of Energy and Climate Change, 2014). This strategy outlined government policy directions to support community participation in renewable energy generation and heat supply, energy saving, energy demand management, and collective purchasing and switching. The strategy also sought to create an enabling environment for community energy projects through measures such as strengthening partnerships with local authorities and businesses and building community capability.

However, support measures for renewable energy scaled back in 2015 after the dissolution of the coalition government between the Conservative Party and the environmentally focused Liberal Democrats (2010–2015), a change that also affected community energy projects. The new government, led solely by the Conservative Party, reduced the applicability of the FIT scheme and shifted its focus to support measures such as the Renewables Obligations scheme and the Contracts for Difference scheme, which were better suited to large-scale renewable energy projects (Braunholtz-Speight et al., 2018; Verde and Rossetto, 2020). Subsequently, community energy growth decelerated.

(c) Organizational Support

In the UK, specialized organizations that help establish and manage community energy projects have also contributed to their widespread deployment (Braunholtz-Speight et al., 2018). These include Community Energy Scotland (established in 2007), Community Energy Wales (established in 2012), and Community Energy England (established in 2014), all of

which are committed to sharing knowledge and information and building networks among community energy groups.

Another organizational support factor is that experienced groups provide services to facilitate the development of community energy projects. For example, founded by Baywind Energy Co-operative, Energy4All is a family of co-operatives dedicated to helping communities develop renewable energy projects, with more than 30 co-operatives as members. Energy4All helps communities raise the funding they need, access high-quality project managers, and improve overall project management. Once a new co-operative is built and operational, it too supports other community energy projects through the Energy4All membership network (Energy4All, n.d.).

(d) Initiatives in England, Scotland, and Wales

The UK Government has set an ambitious target of 8 GW of local and community-owned energy projects by 2030 (UK DESNZ, 2025b). The Scottish Government has set a target of 2 GW of community energy projects by 2030, while the Welsh Government aims to achieve at least 1.5 GW of locally owned renewable power generation capacity by 2035. To achieve these goals, each government has supported local authorities and communities for decarbonization projects.

① England

In England, under the Local Net Zero Hubs program, five Net Zero Hubs—the North East and Yorkshire Local Net Zero Hub, the North West Local Net Zero Hub, the Midlands Local Net Zero Hub, the South West Local Net Zero Hub, and the South East Local Net Zero Hub—support local authorities and communities by developing and promoting net zero projects, attracting commercial investment, and sharing information and knowledge with residents (UK DESNZ, 2026b). In addition, GBE launched a GBP 5 million Community Fund, which is allocated to community clean energy projects through each Net Zero Hub.

② Scotland

The Scottish Government has actively promoted local and community ownership of renewable energy projects⁶. Renewable energy accounted for 97% of Scotland's electricity demand in 2020, and clean energy co-operatives and locally owned generation facilities generated nearly 10% of that supply (Hockenos, 2022).

The Scottish Government's key support program, the Community and Renewable Energy

⁶ The Scottish Government defines community energy as renewable power generation carried out only by not-for-profit local groups (Verde and Rossetto, 2020).

Scheme (CARES), provides funding and expert advice to facilitate community ownership of renewable energy projects (Scottish Government, n.d.). Under the Good Practice Principles, the Scottish Government also encourages renewable energy developers to consider shared ownership—“any structure which involves a community group as financial partner over the lifetime of a renewable energy project” (Scottish Government, 2019).⁷

Furthermore, a pilot scheme is underway to give community groups priority in leasing one of 10 publicly owned Forestry and Land Scotland sites with wind farms for repowering projects (Scottish Government, 2025). This scheme aims to provide local communities with opportunities to benefit from wind repowering projects.⁸

③ Wales

Since 2018, the Welsh Government has supported the public sector and community groups in accelerating the energy transition through the Energy Service program (Welsh Government, n.d.). It provides grants and technical, commercial, and procurement advice for energy projects, such as renewable energy, low-carbon heat, energy conservation, zero-emission vehicles, and electric vehicle charging infrastructure.

2.2 Local Power Plan (LPP)

With the 2024 change in government, community energy has gained momentum again. In February 2026, the UK Government announced the Local Power Plan (LPP). Under the LPP, the government will accelerate local clean energy development through GBE by investing GBP 1 billion—the largest-ever public investment in community energy projects. The LPP outlines a vision in which “every community in the UK will have the opportunity to own a local energy project” by 2030 (UK DESNZ and GBE, 2026).

The LPP highlights the importance of local governments and communities retaining ownership of clean energy projects. With ownership, they can control their own energy and reap its benefits. In addition to creating local jobs and strengthening energy security, clean energy projects owned by local governments and communities are expected to reduce energy costs, allowing the savings to be reinvested in the local community for other priorities (UK DESNZ and GBE, 2026).

The LPP is designed not only for local governments and community energy groups, but

⁷ The Scottish Government aimed to have at least half of newly consented renewable energy projects under shared ownership arrangements by 2020 (Scottish Government, 2019).

⁸ For this pilot scheme, Forestry and Land Scotland gives communities advance notification of upcoming lease opportunities to have sufficient time for preparation. Meanwhile, community groups receive dedicated guidance for repowering projects, including support with financing, evaluation and governance, as well as targeted support through CARES (Scottish Government, 2025).

also for members of the public interested in exploring community energy, as well as other public sector organizations that could benefit from renewable energy. The program aims to support over 1,000 community energy projects and expand shared ownership. The LPP covers clean energy technologies such as wind, solar, hydroelectric (including wave and tidal energy), bioenergy, and electricity storage (UK DESNZ and GBE, 2026).

The LPP lays out four support measures to overcome barriers and market failures that prevent project development. First, direct funding ensures access to finance, improves projects' economic viability, and mobilizes private capital. Second, GBE provides a team of experts to help communities plan and develop projects and build their capacity. Third, GBE presents a long-term plan to attract more investment in local and community energy by developing revenue-generating business models. Fourth, revised policies and regulations will foster community energy projects. Specifically, mandating shared ownership in community energy projects and ensuring communities have fair access to the energy market and the grid are issues for consideration (UK DESNZ and GBE, 2026).⁹

In addition, the UK Government proposed a potential mandatory scheme that would require developers of low-carbon energy infrastructure to provide community benefit funds. In May 2025, the Government released a working paper to seek opinions on the scheme's design (UK DESNZ, 2025b).

While community benefit funds have been provided on a voluntary basis, their management has varied across clean energy technologies and regions. Making such funds mandatory through regulation is expected to ensure a fair and uniform approach to sharing the social and economic benefits derived from community energy projects. The technologies under consideration for the scheme's scope include low-carbon power generation with a minimum threshold capacity of 5 MW—such as onshore and offshore wind, solar, tidal stream, hydro, nuclear, electricity generation with CCUS (carbon capture, utilization, and storage), and hydrogen to power—as well as battery energy storage systems and long-duration energy storage. Developers using these technologies would be required to establish community benefit funds tailored to local conditions in collaboration with residents.¹⁰ A mandatory scheme is expected to take effect by the end of 2027 at the earliest.

The working paper also examines how best to facilitate shared ownership of renewable energy generation infrastructure. Under shared ownership models, a community group has an opportunity to invest in a commercially owned renewable energy project, with the community's share of the project considered community-owned. Through this partial

⁹ As of 2024, 25 organizations were involved in shared ownership energy projects, and another 70 organizations were planning such projects (Community Energy England, 2025).

¹⁰ Low-carbon energy infrastructure with capacities below 5MW are encouraged to provide community benefits voluntarily (UK DESNZ, 2025b).

ownership, communities become directly involved in the project, which can deepen their understanding of project management, while allowing them to benefit from the project's revenue and social advantages. However, shared ownership carries risks, as it requires communities to bear a significant portion of the project's costs and provide the necessary personnel and technical expertise.

How the UK's new initiatives affect local governments and communities, and whether they lead to an increase in community energy projects, may offer useful lessons for other countries.

3. EU: Energy Community Development

3.1 EU's Energy Community Policy

(1) Regulatory Framework for Energy Community

In the Renewable Energy Directive amended in 2023 (RED III), the EU set a legally binding target for renewable energy to account for at least 42.5% of the energy mix by 2030, with an aspiration to reach 45%. To promote renewable energy adoption, the EU has encouraged power purchase agreements (PPAs), the streamlining of permitting processes, the establishment of renewables acceleration areas, and the development of renewable energy communities (European Commission, n.d.-a).

In the EU, energy communities are “legal entities that empower citizens, small businesses and local authorities to produce, manage, share and consume their own energy” (European Court of Auditors, 2026).¹¹ Citizen-driven energy communities enhance public acceptance of renewable energy projects and mobilize private investment in the clean energy transition (European Commission, n.d.-b). Energy communities are expected to restructure the energy system by enabling citizens to drive the energy transition at the local level and directly reap benefits such as energy efficiency, lower energy costs, and more local green jobs. The REPowerEU Plan, announced in 2022, set a political objective of establishing one energy community in every municipality with a population of more than 10,000 by 2025.¹² The Affordable Energy Action Plan also positions energy communities as a means of accessing affordable renewable energy and emphasizes the need to strengthen them.

With the Clean Energy Package adopted in 2019, the EU introduced the concept of energy communities into legislation. Energy communities are defined in two separate directives of the package (Caramizaru and Uihlein, 2020). The first is the revised Renewable Energy Directive (EU) 2018/2001 (RED II), which established a framework for renewable

¹¹ The term “energy community” is used throughout this chapter.

¹² As of January 2025, the EU had achieved only 27% of this target (European Court of Auditors, 2026).

energy communities covering renewable energy specifically. The second is the revised Internal Electricity Market Directive (EU) 2019/944 (IEMD), which introduced citizen energy communities in the energy system, including all types of electricity.

Renewable energy communities and citizen energy communities have similar concepts, but their definitions are partially different. RED II Article 2 (16) and IEMD Article 2 (11) define these legal entities, respectively. Both definitions share the following common elements: participation is open and voluntary; members or shareholders—such as natural persons, local authorities, and small and medium-sized enterprises—exercise effective control; and the primary purpose is to provide environmental, economic, or social benefits to the community, rather than financial profits. However, the two concepts differ in the following points. In renewable energy communities, the community's autonomy is maintained, and the renewable energy projects are effectively controlled by shareholders or members located in the proximity of the projects. In contrast, citizen energy communities must engage in activities such as generation, distribution, supply, consumption, aggregation, energy storage, energy efficiency services, or electric vehicle charging services.

EU Member States are required to transpose the directives into national legislation. Only a few Member States have explicitly incorporated the definitions of renewable energy communities and/or citizen energy communities into their national laws (REScoop.eu, n.d.). Even in countries that have incorporated these definitions into domestic regulations, they have different perspectives on which organizational structures are regarded as energy communities (Koltunov et al., 2023).

(2) Citizens Energy Package

In March 2026, the European Commission published the Citizens Energy Package to deliver affordable energy and empower citizens to actively participate in the clean energy transition. As part of this package, a Communication set out actions to “lower energy bills for households, protect and empower consumers, tackle energy poverty, and implement the existing EU laws effectively” (European Commission, n.d.-c). This Communication highlights the important role of energy communities in empowering consumers.

According to this Communication, more than 8,000 energy communities are active in Europe, and vast untapped potential remains, particularly in rural areas, for utilizing renewable energy sources such as biogas and biomethane (European Commission, 2026a). The goal is to increase renewable energy capacity in energy communities by up to tenfold by 2030, through encouraging investments in communities that develop renewable energy. In terms of economic benefits, households that generate and consume their own solar power are estimated to save EUR 260–550 per year, while energy communities that utilize wind and

solar power are projected to generate annual revenue of EUR 440–930. To achieve the goal, the European Commission will:

- provide guidance to Member States on how to unleash the potential of energy communities and energy self-consumption by Q1 2026;
- adopt an implementing regulation on data interoperability to ensure that energy sharing is easy to use and fully automated by 2027; and
- issue a series of practical, step-by-step guides on how to set up and manage community energy projects by 2026–2027.

On April 30, 2026, the European Commission presented a package of recommendations to protect citizens and support the shift toward a more inclusive, resilient, and sustainable energy system (European Commission, n.d.-d). One recommendation includes practical guidance for Member States to facilitate the deployment of energy communities and maximize the potential of self-consumption (European Commission, 2026b).¹³ This document provides a comprehensive framework for promoting the adoption and use of renewable energy led by citizens and local communities, in order to accelerate the EU's energy transition. It also outlines measures that Member States should take to help energy communities overcome challenges, including difficulties in mobilizing finance at the early stage of project development, navigating complex administrative procedures, and securing investment in infrastructure. An ambitious target is to develop a national strategy for energy communities and self-consumption, including an assessment of their potential contribution to EU energy objectives by 2030 and 2040 (European Commission, 2026b).

3.2 Energy Community Initiatives of EU Member States

While the EU has made energy communities a priority, Member States have adopted them to different extents. There is a disparity between countries that have established energy co-operatives and those that have not. Energy communities are particularly prevalent in higher-income Northern and Western European countries, where community ownership of energy projects has a long-standing tradition (Caramizaru and Uihlein, 2020).

This section reviews the background of energy community development and the latest policies in Germany and the Netherlands, two leading countries in this field. It also analyzes policy developments in Italy, as the country has seen an increase in energy communities in recent years, although it was a latecomer.

¹³ This document requires Member States to clearly differentiate between the two concepts of renewable energy communities and citizen energy communities. However, the European Court of Auditors (2026) found that the legal definitions of these two energy communities at the EU level are not clear.

(1) Germany

Germany has the largest number of energy communities in Europe, with approximately 1,700 communities as of 2016. Co-operatives, which mainly focus on solar power generation, account for more than half (55%) of energy communities, followed by limited liability companies (37%) (Eriksson Berggren et al., 2023). Most energy communities are engaged in renewable power generation, such as solar and wind, and district heat supply using biomass.

In Germany, co-operatives are well-established organizations that have long supplied electricity, particularly in rural areas, which laid the foundation for energy community development (Eriksson Berggren et al., 2023). In addition, *Energiewende*—Germany’s politically driven initiative to transition away from nuclear power and toward a low-carbon energy system—has also helped boost renewable energy use (Verde and Rossetto, 2020).

The number of energy communities focusing on renewable energy has increased since 1995 (Eriksson Berggren et al., 2023). The Renewable Energy Sources Act (*Erneuerbare-Energien-Gesetz*, EEG), introduced in 2000, included the FIT scheme and prioritized renewable electricity for grid connection, both of which spurred investment in renewable energy. The 2006 Amendments to the Co-operative Law also encouraged the establishment of energy co-operatives (IRENA Coalition for Action, 2020; Eriksson Berggren et al., 2023).¹⁴ New energy communities, especially those focusing on solar power, increased substantially between 2006 and 2013. However, lower FIT rates and a shift to an auction system slowed their growth. From 2013, wind projects in the form of limited liability companies increased because of changes in the EEG, and limited liability companies replaced co-operatives as the predominant legal structure of energy communities. Recently, insufficient digital infrastructure has posed a technical constraint to energy communities (Eriksson Berggren et al., 2023).

Regarding the two EU directives, Germany has partially transposed the provisions on renewable energy communities and citizen energy communities into national laws (Deutsche Energie-Agentur [dena], 2024). However, the absence of specific regulations on energy sharing has hindered the development of energy communities in Germany (Eriksson Berggren et al., 2023).¹⁵ In November 2025, the German parliament (*Bundestag*) passed an amendment to the Energy Industry Act (EnWG), which introduced a new energy sharing regulation in Section 42c (Taylor Wessing, 2025). The EEG has allowed tenant electricity

¹⁴ The minimum number of members required to establish a co-operative was reduced from seven to three, and regulations were relaxed to allow co-operatives with 20 or fewer members not to have auditors and multiple directors in their articles of incorporation (Tabuchi, 2014). However, the EEG 2021 stipulates that an energy community must have at least 10 natural persons as members (European Commission, n.d.-e).

¹⁵ Energy sharing refers to “the coordinated consumption of electricity generated jointly in close proximity using the public grid” (dena, 2024).

models, in which electricity “generated in, on, or at a residential building” is “supplied directly to the tenants or homeowners and owners without using the public grid” (dena, 2024). Under the amendment, end users can form energy communities and jointly develop renewable energy systems from June 2026. Generated electricity can be shared with other consumers in the same balancing area via the public grid, with a phased expansion to neighboring grid areas by 2028 (Taylor Wessing, 2025). Although challenges such as the administrative burden on energy communities and grid connection costs remain, this legislative amendment enables more flexible use of renewable energy and opens new possibilities for energy communities.

(2) The Netherlands

The Netherlands has encouraged the development of energy communities to reduce CO₂ emissions and expand the use of renewable energy (Tarpani et al., 2022). The number of energy co-operatives has increased substantially from 27 in 2010 to 696 in 2025 (HIER, 2025). They engage in solar and wind power generation, energy saving, heat supply, and projects that combine these activities. As of 2025, their total operating capacity reached 439.6 MW for solar and 335.9 MW for wind (HIER, 2025).

Policy measures that facilitate the establishment of energy communities have driven a robust increase in their numbers. First, a tax reduction scheme known as the Postal Code Rose Regulation (PCRR) was introduced in the Environmental Tax Act in 2014 (Diestelmeier and Swens, 2021). The scheme was geographically restricted: members of co-operatives or homeowners’ associations living within a particular postal code area were eligible for tax reductions on energy produced within a collective renewable energy project in the same postal code area. In April 2021, the PCRR was replaced by a new subsidy scheme for co-operative energy production (*Subsidieregeling Coöperatieve Energieopwekking*) (Diestelmeier and Swens, 2021). This new measure provides subsidies based on the amount of renewable power generated to help co-operatives recover their investments in generation facilities.

Second, the Dutch Experimentation Decree was implemented between 2015 and 2018 as an experimental regulation on decentralized renewable power generation (Diestelmeier and Swens, 2021). This decree aimed to increase the generation, distribution, or supply of decentralized renewable electricity and provided exemptions from specific articles of the 1998 Electricity Act. Specifically, projects approved under this decree were exempt from the requirement that only designated distribution system operators manage an electricity system and were allowed to set network tariffs without prior approval by the regulatory authority (Diestelmeier and Swens, 2021).

Third, a revolving development fund is available to energy co-operatives to cover the start-up costs of wind and solar projects. Energy co-operatives can apply for interest-free

loans ranging from EUR 10,000 to EUR 300,000, depending on the project development stage, and covering up to 80% of development costs for wind and solar projects. European Court of Auditors (2026) found this fund effective in derisking projects at an early stage.

Furthermore, in the Netherlands, systematically established organizational structures supporting energy communities have also contributed to their widespread adoption. The Ministry of Economic Affairs and Climate Policy and the Netherlands Enterprise Agency are the government bodies responsible for policy development and implementation, respectively (Eriksson Berggren et al., 2023). In addition, Energie Samen and HIER play a crucial role in supporting energy communities. Energie Samen shares knowledge, experience, and capital, provides training courses, and stimulates and coordinates innovation within the co-operative energy sector. It also advocates for ensuring “the voice of the energy communities is heard in policy, legislation and regulations” (Energie Samen, n.d.). HIER publishes data and a report on the development of citizen energy initiatives (HIER, 2025).

The Energy Act, which consolidates the Electricity Act and the Gas Act, came into force on January 1, 2026. For the first time, this Act recognizes energy communities as legal entities and establishes them as official market players in the energy market (European Energy Communities Facility, 2025). The Energy Act mandates priority grid access for renewable energy producers and introduces mechanisms to enhance consumer protection. The country has also focused on decentralized energy systems and introduced a framework to support local and community-based energy projects, thereby facilitating local energy production and citizen participation (Law and More, 2025). The new Act envisions citizens as energy prosumers. If it works effectively, the number of energy communities is likely to increase further.

In the Netherlands, grid congestion that delays connecting renewable energy projects is one obstacle to energy community deployment (European Court of Auditors, 2026). In addition to prioritizing renewable energy for grid connection, the new legal framework facilitates the balancing of electricity supply and demand within energy communities, which is expected to alleviate grid congestion.

However, the energy community concepts in the Netherlands are not aligned with the EU directives. While the EU directives define renewable energy communities and citizen energy communities separately, the Energy Act adopts a single definition covering both (European Court of Auditors, 2026).

(3) Italy

Italy once lacked sufficient policy support for energy communities and lagged behind other EU Member States in deploying them. In recent years, however, the country has developed a regulatory framework to encourage energy communities, and the framework's

effects have begun to emerge.

In Italy, energy community initiatives have gained momentum since the country transposed the energy community provisions of both EU directives—RED II and IEMD—into national legislation. First, in 2019, Legislative Decree 162/2019 specified two possible energy community schemes: collective self-consumption and renewable energy communities (Tarpani et al., 2022). Subsequently, in 2021, Legislative Decree 199/2021 and Legislative Decree 210/2021 incorporated the energy community provisions in RED II and IEMD, respectively (Zhu et al., 2025). Before these regulatory developments, only 77 energy communities existed, but their number rose to 119 in 2022 and further increased to 421 as of June 2025 (Koltunov et al., 2023; European Court of Auditors, 2026). Previously, most energy communities were energy co-operatives, especially in rural areas. Transposing the EU directives into national regulations has enabled new players to join the market as energy communities, including local governments, small and medium-sized enterprises, NGOs, research institutions, and social housing associations (Koltunov et al., 2023).

Incentive schemes have also contributed to the growth of energy communities. Legislative Decree 199/2021 set a premium tariff on shared energy—EUR 110/MWh for renewable energy communities and EUR 100/MWh for self-consumption—applied to the net amount of shared electricity, calculated as the difference between electricity supplied to the grid and electricity received from the grid (Tarpani et al., 2022). In addition, Ministerial Decree 414/2023 introduced capital grants covering up to 40% of eligible costs for collective self-consumption and renewable energy communities in municipalities with fewer than 5,000 inhabitants, aiming to develop 2 GW of renewable energy capacity (Ministero dell'Ambiente e della Sicurezza Energetica, 2024).¹⁶ Ministerial Decree 414/2023 also sets the maximum premium tariff for shared energy, depending on the power plant capacity.¹⁷ Through these two incentive measures (the capital grants and the premium tariff), the country aims to develop 5 GW of renewable energy capacity by the end of December 2027.

Furthermore, expanded eligibility criteria for support schemes have contributed to the adoption of energy communities. Legislative Decree 199/2021 raised the capacity limit for renewable energy systems eligible for grid connections from 200 kW to 1 MW (Tarpani et al., 2022). In 2025, Italy also raised the population threshold for municipalities eligible for capital grants from 5,000 to 50,000 inhabitants (European Court of Auditors, 2026).

While Italy has seen robust growth in energy communities, complex administrative procedures and financial burden pose barriers for municipalities with limited resources and

¹⁶ These grants are funded by Italy's National Recovery and Resilience Plan (Piano Nazionale di Ripresa e Resilienza, PNRR), which allocates EUR 2.2 billion for this purpose.

¹⁷ The premium tariff is stipulated in Annex 1: EUR 100/MWh for installations with a capacity above 600 kW, EUR 110/MWh for installations between 200 kW and 600 kW, and EUR 120/MWh for installations below 200 kW.

capacity (Zhu et al., 2025). Furthermore, energy communities are concentrated in the northern regions, reflecting regional disparities. Therefore, further efforts are needed to promote their nationwide adoption. Additionally, because many energy communities currently rely on solar power, establishing a framework that enables the use of wind and biomass could also help expand energy communities.

4. Implications for Coexistence of Renewable Energy with Communities in Japan

Japan also has projects comparable to community energy. Examples include local power producers and suppliers funded and managed by citizens, local businesses, and municipalities, as well as projects in areas selected by the Ministry of the Environment as Decarbonization Leading Regions.¹⁸ However, these projects are not categorized specifically as community energy, and public awareness remains low. Drawing on policy implications from European initiatives, this section identifies the key factors necessary for widespread adoption of community energy in Japan so that renewable energy projects can coexist with local communities.

First, community energy initiatives need support measures. Because small-scale community energy projects have limited access to financing to cover high upfront costs, subsidies and tax incentives for capital investment can be effective measures. Where feasible, a subsidy program focused specifically on community energy, such as the one in the UK, would provide support directly to communities. Although community energy grew in Europe since the FIT scheme took effect, its deployment slowed after the scheme ended and an auction system was introduced. Because Japan has also shifted to an auction system for purchasing renewable energy, the environment for community energy has become more challenging. While maximizing profit is not the primary objective of community energy projects, revenue from selling electricity is crucial to a project's viability. Therefore, policy measures that ensure a stable revenue stream are needed to sustain community energy projects.

In addition to financial support, knowledge-sharing measures such as practical guidance on establishing and operating community energy projects can also be useful, as recommended in the EU's Citizens Energy Package. Such assistance could help promote understanding of community energy and facilitate the sharing of reliable information nationwide.

The UK's LPP encourages local governments and communities to retain ownership of

¹⁸ For example, in the small-scale hydropower project of the regional collaborative model in Takayama City, Gifu Prefecture, consensus is sought among residents of the neighborhood association where the facility is planned to be built. This consensus-building is facilitated by presenting, in advance, ways for local participation and contribution, such as operation and maintenance and joint investment. The project will reinvest a portion of its revenue in local community development initiatives (Ministry of the Environment, n.d.).

clean energy projects. While shared ownership is expected to enhance social acceptance among local communities, building trust between project developers and communities and reaching consensus may require considerable time (Hogan, 2024). Policies that support both project developers and communities may therefore be necessary to facilitate shared ownership. If shared ownership becomes mandatory, the UK's policy implementation and outcome could provide a useful precedent for Japan.

Second, establishing a legal framework for community energy lays the foundation for project development. The EU's two definitions of energy communities may have confused stakeholders, which potentially delays project development. To address this, a clear definition of community energy is fundamental for its widespread adoption. Clarifying what constitutes community energy is also important because this definition will serve as the basis for determining eligibility for government support. Furthermore, regulations are needed when community energy is integrated into the electricity system, including procedures and permissible generation capacity for grid connection.

The Netherlands has enacted the Energy Act, which envisions community energy and citizens as prosumers playing an active role in the energy system. Although the Act has only recently come into effect, its implementation could offer valuable lessons on how community energy can function within the energy system and contribute to decarbonization.

Third, designating a specific administrative body to oversee community energy could work effectively. For example, GBE, a publicly owned company, was established to support community energy in the UK, and the Netherlands Enterprise Agency is responsible for implementing community energy policy in the Netherlands. In Japan, however, multiple ministries and agencies work on programs that support renewable energy projects similar to community energy.¹⁹ Community energy stakeholders may face difficulties such as procedural complexity and administrative costs because of the fragmented administrative nature. A single agency responsible for community energy could provide efficient support and management focused specifically on community energy. If such an agency offered a one-stop service, it would clarify the contact point for community energy stakeholders and facilitate data provision and information sharing.

Fourth, establishing an organization dedicated to supporting community energy could be

¹⁹ Under its Commendation for Community-based Renewable Energy Projects, the Ministry of Economy, Trade and Industry (METI) awards the Community Coexistence Mark to outstanding projects that work to expand renewable energy coexisting with local communities (Agency for Natural Resources and Energy, METI, n.d.). In addition, seven government bodies—the Cabinet Office, the Ministry of Internal Affairs and Communications, the Ministry of Education, Culture, Sports, Science and Technology, the Ministry of Agriculture, Forestry and Fisheries, METI, the Ministry of Land, Infrastructure, Transport and Tourism, and the Ministry of the Environment—provide many support measures and frameworks, including financial assistance, to assist decarbonization efforts at the local level (Ministry of the Environment, n.d.).

useful in encouraging community energy projects. In the UK, Community Energy England operates in England, and similar organizations also exist in Scotland and Wales. In the Netherlands, Energie Samen supports community energy projects and acts as an intermediary between the government and communities. Such organizations, which are close to communities and provide hands-on support, can help address the limited resources and expertise of community energy initiatives. They also importantly support information sharing and capacity building to improve understanding of community energy.

Fifth, deploying new technologies is vital for managing community energy projects efficiently. For example, digital technologies can be used to optimize energy system operations. Furthermore, integrating energy storage, such as battery energy storage systems, with variable renewable energy sources (wind and solar) enables a stable power supply and backup power during outages caused by natural disasters, thereby enhancing community resilience.

Community energy can enhance public acceptance of renewable energy. To accelerate decarbonization, community energy offers a business model that can help renewable energy coexist with local communities. However, because community energy projects are primarily small in scale, they often face financial and technical hurdles. Although Japan has introduced support measures for projects comparable to community energy, these measures tend to be fragmented, making it difficult to gauge their effectiveness. It is time to reconsider the policy approach to community energy. In this context, community energy initiatives that foster local production and consumption of renewable energy would be an effective measure.

Conclusion

Community energy has become increasingly important in Europe for accelerating the energy transition, reducing energy costs, and strengthening energy security. Both the UK and the EU are actively pursuing policies to encourage its development. In the UK, the Labour government, which came to power in 2024, has stepped up efforts to promote community energy. One of GBE's primary missions is to support local governments and communities in participating in clean energy projects. Under the LPP, GBE will work in partnership with local governments and communities to facilitate the development of clean energy projects.

The EU, which is accelerating the adoption of renewable energy in part to address geopolitical risks, also positions the deployment of renewable energy communities as one of the key measures in its energy transition. The EU has established legal definitions for renewable energy communities and citizen energy communities in its directives and has proposed policy measures to promote their expansion. Member States have also created a

favorable investment environment for community energy by formulating regulations and offering incentives.

These European community energy initiatives will demonstrate the effects of these policy measures. To accelerate the energy transition, it is critical not only to pursue large-scale renewable energy projects but also to develop small-scale projects involving local communities. Community energy can improve social acceptance and serve to ensure that renewable energy projects coexist with local communities.

Japan needs to better understand the role of community energy in facilitating coexistence between renewable energy and local communities and tailor community energy to local conditions. Such an approach could encourage renewable energy deployment. Ultimately, community energy will help Japan to achieve its goal of establishing renewable energy as a major power source.

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