National policy roadmap for Greece

Summary

This policy roadmap aims to offer practical and relevant policy suggestions for national policymakers, regional authorities, and participants in bioenergy communities, drawing on insights and discoveries from the BECoop project. It highlights the potential of community bioenergy in Greece to help achieve national energy and climate objectives while enhancing energy security and independence. Additionally, the roadmap seeks to initiate discussions on regulatory support for community bioenergy within the country.

The development of this policy roadmap is based on three methods for policy engagement and debate: a policy analysis, stakeholder consultations, and an expert workshop. The information and analyses stemming from these processes are outlined in an initial section that describes the current status of community bioenergy in Greece. It is followed by a section that presents the goals and visions for community bioenergy in 2030 and 2050, as articulated by national policies, and relevant stakeholders.

In the final section, the roadmap offers specific policy recommendations aimed at unlocking the potential of community bioenergy in Greece by 2030 and 2050. Five key recommendations emerge in relation to Greece's regulatory frameworks. To enhance social perceptions, it is vital to offer accessible information on bioenergy community benefits, recognise links to local democratic entities, and boost awareness of energy security and climate change. Improving the legal framework entails a specialised approach for energy projects, alongside a tax-exempt virtual net-metering system for small cooperatives. Decarbonising heating involves clean energy funding, agricultural cooperatives' promotion, and biomass utilisation. Supply chain integration involves agricultural biomass support. These measures align with NECP priorities, focusing on clean energy, forest management, energy crops, livestock cooperatives, and innovative solutions.

The roadmap concludes by providing a sequencing of the proposed measures in four areas of activity: the decarbonisation of the heating sector, new regulatory measures, improved social perceptions as well as faster local diffusion. In the short term, it is crucial to prioritise the creation of integrated strategies for supply chains, along with providing financial incentives to promote heating system installations and efficiency standards within local supply chains. These efforts should be complemented by awareness campaigns and a long-term focus on establishing stable regulatory frameworks and partnerships.

Purpose and development of the roadmap

In Greece, community bioenergy can make a significant contribution towards decarbonising the economy, lowering energy bills, increasing energy independence and improving public participation in energy decision-making.

The purpose of this policy roadmap is to provide practical and applicable policy recommendations for national policymakers, regional authorities and bioenergy community actors based on insights and findings of the BECoop project. The roadmap outlines the opportunities of community bioenergy for Greece to meet national energy and climate targets and increase energy security and independence. Furthermore, the roadmap intends to open the policy debate around the regulatory promotion of community bioenergy in the country.

The policy roadmap has been developed based on three main methods: a policy analysis, stakeholder consultations, and an expert workshop. First, key policy documents at European and national levels were reviewed to identify the policy frameworks and enabling mechanisms for bioenergy communities in Greece. We reviewed the Greek National Energy and Climate Plan (NECP) and other policies and legislation, including directives on renewable energy, for their policy objectives and measures on bioenergy and community energy. The analysis enabled the development of draft policy recommendations to unlock the community bioenergy potential in Greece.

Second, we surveyed stakeholders and participants working with the BECoop network, to understand the findings of other relevant policy work within the project and beyond, and to compile insights into the structuring of strategic templates and recommendations.

Third, we held a national policy workshop (Figure 1) to discuss and validate the policy roadmap with key actors in the community energy-field in Greece. The workshop took place in Athens, on the 10th of May, parallel to the RESCoop Community Energy Spring Gathering. It was attended by 10 stakeholder representatives of energy communities and co-operatives, think tanks and foundations, as well as academic, technical, business and biomass associations.

Figure 1 - Participants at the BECoop national policy workshop in Greece.

The findings of all three stages have been brought together in this document. The roadmap is structured as follows: Firstly, it outlines the current status of community bioenergy in Greece. Secondly, it presents the targets and visions for (community) bioenergy in 2030 and 2050 as described by national polices and other relevant actors. Thirdly, it proposes concrete policy recommendations to unlock the community (bio)energy potential in Greece by 2030 and 2050. The roadmap provides a timeline with concrete measures and priorities.

Community (bio)energy – current state of play

In Greece, there is no specific legislative and policy framework targeted towards bioenergy communities, so the broader energy community policy framework applies.

Energy communities are defined by the law 4513/2018. According to this statute:

- The mandatory activities of energy communities (ECs) are energy provision services, energy management and storage, and the production of raw materials for biomass.
- Optional activities of ECs include the management of funding programmes, raising awareness among local people, and supporting vulnerable groups against energy poverty.

In Greece, ECs are seen as promoting a social and solidarity-based economy and innovation in the energy sector, addressing energy poverty and promoting sustainability as well as improving energy efficiency at local and regional levels.

From 17 to 27 of February 2023, the Minister of Environment introduced a new law regarding the use and production of electricity from renewables that affect ECs. It is not clear yet what is going to happen with ECs that formed as a result of Law 4513/2018. The new law promotes two other forms of ECs: renewable energy communities and citizen energy communities.

Status of community (bio)energy projects in Greece

According to the Community Energy Observatory (http://electraenergy.coop/observatory/), as of November 2022 there were over 1400 energy communities in Greece (Table 1).

Table 1 - General characteristics of registered RESCoops in Greece.

Central Macedonia	263
Western Macedonia	261
Attica	176
Western Greece	171
Thessaly	137
Eastern Macedonia & Thrace	115
Central Greece	90
Epirus	56
Peloponnese	51
Crete	48
Ionian islands	25
South Aegean	10
North Aegean	3
SUM	1406

The majority of these initiatives were in the north and west of the country, primarily thanks to the availability of agricultural residue and other resources. There is significant potential for the development of ECs in the rest of the country – particularly Thessaly, Epirus and the Peloponnese.

Key barriers and challenges to community bioenergy

In Greece, the development of bioenergy communities is hampered by at least seven factors:

1. **Lack of administrative measures and support**
Despite the favourable provisions of Law 4513/2018, there is a lack of administrative decisions and support measures that will help a new tool such as Energy communities. A big problem for the future development of ECs is article 160 of Law 4759/2020, according to which, from the 1st of January of 2022, each EC must participate in competitive processes, including competing with private investors in bids to ensure the operational support of renewable energy projects.

2. **Challenges surrounding the use of energy crops**
The long-term (2050) energy roadmap for Greece foresees an increasing role of energy crops in domestic energy supply. However, short- and medium-term goals and the policy instruments promoting their use are underdeveloped. There is also a lack of coordination between energy and relevant agricultural policy strategies – the latter do not really consider energy crops, nor do they promote their application. Some practical issues also remain to be solved- farmers switching to woody energy crops should have guaranteed that, in the future, their agricultural land will not change its character and be categorized as a forest.

3. **Lack of financial tools**
Greece, regardless of the legal framework regarding ECs, lacks basic financial tools to support them. There is difficulty financing small projects due to the absence of public policies and the general economic situation. When it comes to ECs, challenges in receiving funding are even greater. Projects operated by citizens with limited financial instruments are characterised by small profit margins.

4. **The low social acceptance of co-operatives**
In terms of the social challenges linked with the development of ECs, it has been pointed out that citizens are reluctant to get involved for different locally applicable reasons. However, the most common reason for the lack of participation is low awareness and knowledge and the negative perception towards co-operative schemes as a whole.

5. **Lack of crisis-specific measures**
No specific policy or legal environment change for bioenergy communities occurred in Greece due to the recent energy crisis. However, European Directives and programmes (such as REPower EU), are leading to a change in the NECP and an increase national RES target (to bring forward the date of achieving carbon neutrality). However, all of this is happening without a specific mention of bioenergy communities.

6. **Carbon neutrality**
From a technical and environmental point of view, ECs are not carbon neutral, as the majority operate RES projects with a low carbon footprint (such as photovoltaic power, wind turbines). Additionally, there is an absence of specific efficiency and emission performance standards, especially for the residential sector. There are no provisions that appliances reaching specified performance standards (e.g. Eco-design or equivalent) should be eligible for support.

7. **Uneven regional development**
Greece is characterised by large economic and infrastructural disparities among regions, worsened by the post-2008 financial crisis and the imposition of austerity. Some regions lack the knowledge base, labour force and infrastructural capacity to support the expansion of bioenergy communities. The promotion of this form of energy investment and organising does not feature in regional development strategies.

Entry points for the adoption of community bioenergy

There are several advantages that Greece can build on in the further expansion of ECs:

In case of bioenergy communities in Greece, value and supply chains are integrated. Specifically, farmers, foresters and enterprises in the agricultural and forestry sector create energy communities with the purpose of creation and management of the biomass supply chain or/ end installation and operation of bioenergy production units. Therefore, the biomass supply chain can provide the bioenergy unit with feedstock.

ECs can implement net - metering and virtual net - metering between consumption and production facilities belonging to the community. The technical and regulatory pre-conditions are well established and functional across a wide range of ECs throughout the country.

ECs can decide that the area of energy production will be equal to the area of installation for energy consumption, or in an adjacent area. This allows energy bills to be significantly reduced.

Policy targets for, and visions of, community bioenergy for 2030 and 2050

Greece has ambitious renewable energy (RES) targets, which can also facilitate the promotion of ECs. Concerning the share of RES in general, Greece's current target is participation of RES in final gross energy consumption is 44% until 2030. RES participation in electricity generation is targeted to be 79% of the mix, while RES in heating is at 46%.

Bioenergy in the National Energy and Climate Plan (NECP)

The 2019 NECP sets high targets for energy efficiency in the residential sector. This mirrors earlier objectives in 2010, such as the roadmap for 2030, which considers the reduction of energy consumption targeted at higher energy efficiency. In residential buildings, the implementation of NECP objectives has led to a reduction in energy consumption for the residential sector as a whole. This is despite the increase in electricity consumption due to the electrification of activities within the household.

In the years 2015-2040, the NECP for Greece expects an increase in the acquisition of solid biomass by 34%. This is a moderate increase that puts Greece behind its national potential. The demand for biomass is expected to increase in all sectors. Along with the increase in the prices of CO_2 emission allowances, the profitability of the use of biomass in the power and heating sectors will increase both in dedicated boilers, hybrid systems and installations co-firing with coal. In households and services, greater use of biomass than before will be associated with the replacement of old coal-fired stoves with modern by pellets-fired ones.

The Greek NECP highlights the benefits of biomass. In terms of economic benefits, the NECP discusses the sectors of bioeconomy, biomass, food and fertilizer, excavation and demolition waste, plastics, textiles and water reuse as areas of focus for the national strategy, which can contribute to the creation of sustainable work cycles, modern and quality jobs and improved quality of life through the provision of resilient and innovative products and services.

[1] The update of the 2019 NECP is still underway and is was not available on the site of the European Commission at the time of publishing this report.

The social benefits include circular economies, which are regarded as a catalyst for productive reconstruction and have an important environmental dimension. The environmental benefits are linked to the challenges regarding environmental impacts in terms of the emission problems (microparticles) due to open/free combustion spots and the absence of certification of the raw material used, which are the main obstacles to further promoting biomass for space heating. To further promote bioenergy, specialised support programmes will be designed both for the development of efficient supply chains for residual biomass / biodegradable matter and for the support and implementation of optimal environmental and energy-efficient bioenergy applications.

In Greece's NECP, it is mentioned that the use of biomass for energy generation in Greece is limited in relation to the availability of residual biomass. The following measures are proposed to promote biomass for energy production:

- Priority in the use of waste (agri-livestock units and industries, urban).
- Supply chain organisation and land planning of sites for temporary storage of agricultural/forest residual biomass.
- Maintenance and extension of the sustainability certification scheme for biofuels, bioliquids and solid fuels.
- Sustainable forest management.
- Strengthening the primary sector through the promotion of energy crops of woody biomass or coppice plantations.
- Creation and enhancement of the domestic bioethanol market.
- Development of the biomethane market.

In terms of energy poverty alleviation, Greece's NECP biomass/biogas projects are listed as a possible example of the development of clean forms of energy, which can promote renewable energy sources and reduce energy poverty. Regarding energy communities more generally, the NECP highlights the importance of the contribution of energy net metering schemes, as they will contribute to the implementation of RES and energy-saving technologies investments and contribute to more active participation of the local community in energy affairs. The NECP mentions a quantitative goal of installing and operating new self-generating and net metering systems, mainly to cover own needs of over 600 MW by the year 2030 (to total more than 1GW of installed capacity), as well as the activation of cumulative representation bodies, giving the possibility for energy communities and citizens to participate in the energy markets. In Greek legislation, a key feature of energy communities is their local and regional scope of operation and membership structure.

The Greek NECP highlights the benefits of energy communities. In terms of the economic benefits, the document mentions the benefits resulting for the local economy in the context of the development of a specific institutional framework for the promotion of energy communities. As for the social benefits, these are linked to net metering and active consumer schemes. The contribution of net metering and energy community schemes is twofold, as they will contribute both to the implementation of RES and energy saving investments, and to more active participation of the local community and ultimately to the strengthening of the role of people in energy activities. Achieving a minimum number of projects through these schemes is deemed to be crucial for shaping and assessing the required implementation framework. In this context, the aim is also to develop innovative net metering schemes, both in energy generation and consumption, thus supporting decentralised energy generation and management.

The quantitative objective is to set up and operate new self-production and net metering systems, primarily with a view to covering own needs of over 600 MW by 2030 (to reach in total more than 1 GW of installed capacity), and to engage aggregators through the possibility of participation of energy communities and people in energy markets.

The environmental benefits of energy communities are discussed by mentioning sustainable forest management. The NECP mentions enhancing the role of energy communities and cooperatives in cleaning up forests to protect them against fires in accordance with specific technical specifications and utilising the woody biomass removed for energy purposes. Poland indirectly discusses the environmental benefits of energy communities. The NECP states that, in line with the Responsible Development Strategy, it is proposed at the operational level to increase stable renewable energy sources - including energy clusters and cooperatives. The amended acts are intended to create a stable environment for the growth of generation in the renewable energy sector - including energy clusters and energy cooperatives.

The NECP mentions promoting energy crops, namely locally produced biomass for the supply of alternative district heating systems and enhancing local crops with high added value (e.g., saffron, rose, oregano, tea), new innovative livestock activities, and promoting the export activities of existing cooperatives and their verticalized development. The NECP also mentions support for the deployment of RES energy projects by energy communities through the use of specialised financing tools. In addition, Greece has already taken measures to promote the participation of demand in the electricity market by instituting aggregators as well as the ability for consumers to participate in energy communities.

The NECP discusses the development of clean forms of energy, funded by projects implemented by energy communities with the participation of natural persons, and/or local authorities and/or legal persons governed by private/public law, aiming to promote renewable energy sources and reduce energy poverty. And it mentions that this axis could include, inter alia, biomass/biogas projects, with the participation of local livestock cooperatives and generally self-production projects with the possibility of utilising existing energy infrastructure (e.g., distribution and/or transmission networks). A policy scorecard was developed for Greece, based on the available data in the 2019 NECP, taking into account broader policy developments, stakeholder views, and the state of the art in bioenergy community development. The policy scorecard identified several areas for potential improvement (Table 2).

Table 2 - A policy scorecard for bioenergy community support – Greek NECP.

Element	GR
Overall regulatory framework and supportfor biomass development	Reasonably well-developed tools to biomass and energy communities as a whole
Economic benefits of bioenergy community development	Well-developed suite of economic measures
Social benefits of bioenergy community development	Need for further development of measures to support the social benefits of bioenergy communities
Environmental benefits of bioenergy community development	Detailed overview of the environmental benefits of biomass use
Poverty alleviation (bioenergy communities)	Need for further development of measures to enhance the poverty alleviation potential of bioenergy communities
Energy community support	Bioenergy communities specifically receive limited attention and support in the NECP

Threats for future bioenergy community development

It is important to note that different threats for future bioenergy community development exist that must be overcome to reduce both unfavourable environmental impacts and other potential risks.

Financing environment

As was noted above, Greece lacks basic financing tools for ECs. There is a need to create a specialised framework for the conduct of competitive procedures that will concern exclusively ECs, as well as establishing stable tax legislation, ensuring a sustainable economic environment for the growth of cooperative schemes. Furthermore, bioenergy plant developers require a guarantee of secure long-term supply contracts prior to proceeding with an investment in a plant. The lack of such tools will hinder the development of ECs in the future.

Logistics of biomass

The logistics of biomass are an important challenge to deal with, as the emissions derived from the supply chain are highly depended on the transportation of the feedstock. Therefore, attention should be given to the type of equipment to be used, along with its emission characteristics and choice of the specific routes to be followed.

Lack of clear future projections

Although it seems promising, the NECP lacks details on how these targets will be implemented (e.g., quantifiable outputs, specific measures/support to be adopted). Future projections regarding bioenergy use in the Greek NECP and long-term energy strategy remain unclear as to exactly what biomass assortments will be mobilised for which pathways, and a specific roadmap for promoting increased utilisation of biomass for energy – or other bioeconomy applications – is lacking. There is a need for developing a dedicated, national biomass strategy that properly takes into account the potential as well as the specific sector conditions in Greece. Based on this, the NECP projections should be updated. Otherwise, the development of bioenergy communities will remain suboptimal.

Recommendations for key policy measures – in the NECP and beyond

Following the provisions laid out in current regulatory and policy frameworks, as well as the opportunities and threats to bioenergy community development in Greece, it is possible to highlight at least five areas where recommendations can be made. To improve social perceptions, priorities include providing accessible information on bioenergy community benefits, acknowledging energy communities' links to local democratic bodies, and raising awareness about energy security and climate change. In terms of legal framework enhancement, it is vital to establish a specialised framework for bioenergy projects targeting energy communities and design a tax-exempt virtual net-metering system for small cooperatives. Decarbonising heating involves funding clean energy via energy communities, promoting agricultural cooperatives' role, and utilising biomass and innovative livestock activities. Supply chain integration centres on technical support for biomass in agriculture. These measures align with NECP priorities, focusing on clean energy, forest management, energy crops, livestock cooperatives, and innovative energy solutions.

Improving social perceptions

Relevant measures include (in order of priority):

- Easy access to information regarding the benefits of being a bioenergy community member.
- Acknowledging that energy communities are attached to local democratic organisations.
- Provision of education and awareness raising in terms of the problems related with energy security supply and climate change.

Improving the legal framework and regulatory environment

Relevant measures include (in order of priority):

- Provision of a specialised framework for the implementation of bioenergy projects targeted to energy communities, thus excluding individual investors. If that is in place, energy communities will be involved in competitive procedures, and consideration will be given to their specificities. The tendering procedure could also consider social criteria, such as whether an energy community promotes the reduction of energy poverty, gender injustices, energy democracy or social justice more generally. Communities working on these topics could receive additional points in the tendering process.
- Design of a virtual net-metering system adopted specifically by small cooperative schemes, with the aim of exemption from tax obligations.

Decarbonising the heating sector more generally

Relevant measures include (in order of priority):

- Development of clean forms of energy, funded by projects initiated by energy communities.
- Development of agricultural cooperatives to allow them to act as a connecting link between the energy and agricultural sectors.
- Promoting the export activities of existing cooperatives.
- Use of existing biomass value chains to promote residual biomass.
- Enhancing the role of energy communities and cooperatives in managing forests, to protect them against fires in accordance with specific technical specifications and utilising the woody biomass removed for energy purposes.
- Promoting energy crops, namely locally produced biomass for the supply of alternative district heating systems, and enhancing local crops with high added value (e.g., saffron, rose, oregano, tea).
- Technical support in the installation and operation of suitable boilers that can handle residual biomass.
- Biomass/biogas projects, with the participation of local livestock cooperatives.
- Innovative livestock activities.

Supply chain integration

Relevant measures include (in order of priority):

- Development of agricultural cooperatives to act as a connecting link between the energy and agricultural sectors.
- Technical support in the installation and operation of suitable boilers that can handle residual biomass.
- Use of existing biomass value chains to promote residual biomass.

NECP priorities

Relevant measures include (in order of priority):

- Development of clean forms of energy, funded by projects implemented by ECs.
- Promoting the export activities of existing cooperatives.
- Enhancing the role of energy communities and cooperatives in cleaning up forests to protect them against fires in accordance with specific technical specifications and utilising the woody biomass removed for energy purposes.
- Promoting energy crops, namely locally produced biomass for the supply of alternative district heating systems, and enhancing local crops with high added value (e.g., saffron, rose, oregano, tea).
- Biomass/biogas projects, with the participation of local livestock cooperatives.
- Innovative livestock activities.

Timeline of measures

The prioritisation of policy measures above is based on the feasibility implementation tools and horizons, as well as the immediate needs that they serve. As a priority in the short term, the development of integrated strategies to support supply chains, as well as financial incentives to encourage the installation of heating systems and the development of efficiency standards and local supply chains are of key priority. These need to be supported by awareness campaigns, with a view to more stable regulatory frameworks and partnerships in the longer term.

The proposed measures are organised in four areas of activity (Figure 2): the decarbonisation of the heating sector, new regulatory measures, improved social perceptions as well as faster local diffusion.

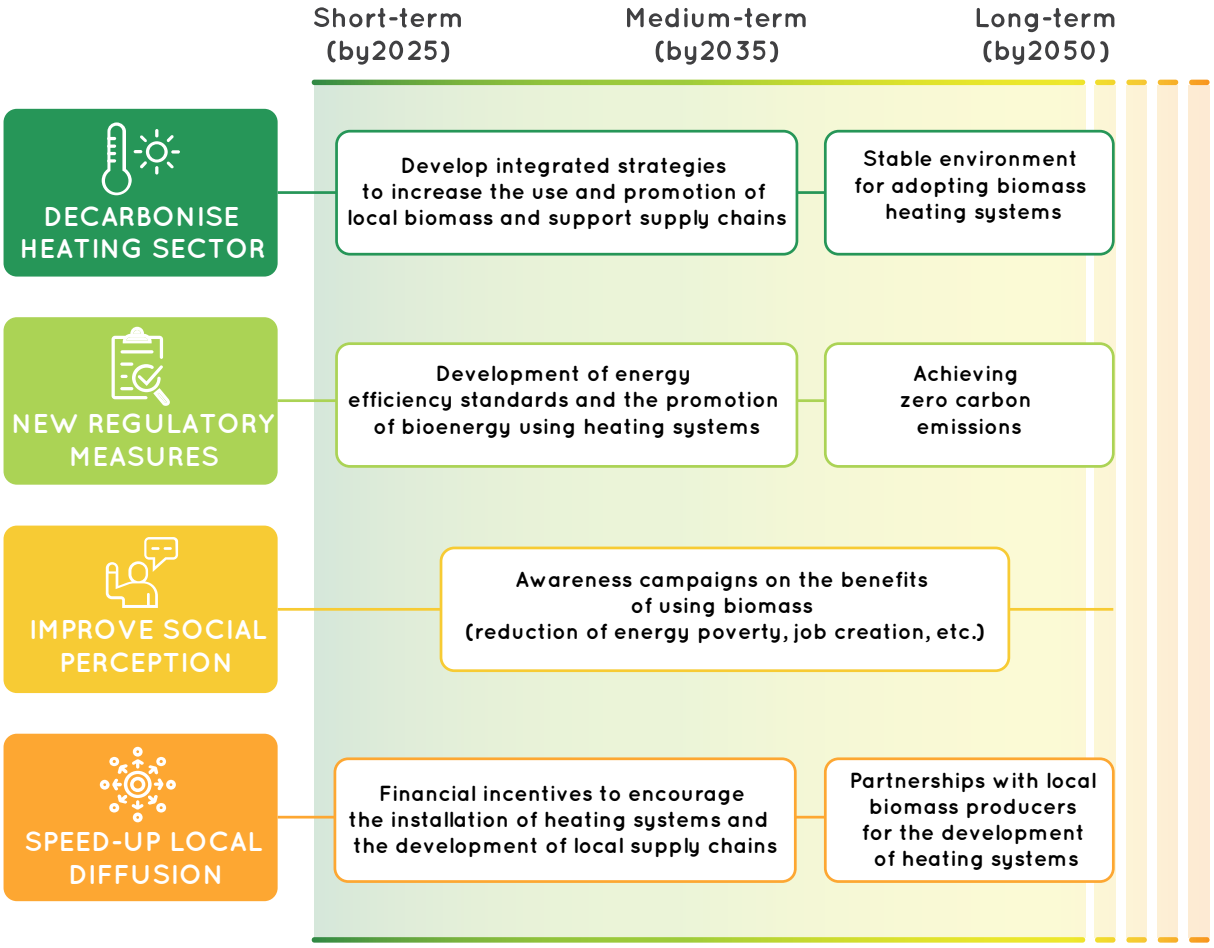

Figure 2 - Proposed policy roadmap for the acceleration of bioenergy communities in Greece.

Conclusions

To summarise, Greece is facing an expansion of (bio)energy communities. However, their development faces obstacles. Administrative support is lacking, and energy communities are now required to compete with private investors for renewable energy project support, hindering their development. Challenges also include inadequate policies for energy crop promotion, limited financial tools, low social acceptance, and a lack of crisis-specific measures. Uneven regional development exacerbates these issues, making bioenergy community expansion difficult.

Proposed policy measures in this roadmap encompass improving social perceptions by enhancing information access, recognising the contribution of energy communities to local governance, and raising awareness of energy security and climate change through public campaigns and education. Legal framework improvements include developing specialised support for energy communities through tendering processes and a virtual net-metering system for small cooperatives. Decarbonising heating, supply chain integration, and enhancing the NECP are all predicated upon further support for agriculture, as well as the utilisation of local biomass resources with the participation of local livestock cooperatives.