

National policy roadmap for Italy

Summary

This roadmap aims to provide practical and policy recommendations for Italian policymakers and decision-makers in the field of community bioenergy. It is based on various insights gathered through reviews of policy documents, decision-maker workshops, and insight from experts in the field. The roadmap includes an outline of the initial situation, challenges, targets, and recommendations, as well as a timeline and sequence of actions.

The roadmap provides specific policy recommendations in four domains: social perception, regulatory framework development, local diffusion, and heat decarbonisation. These include:

- protecting the structural and functional diversity of forests
- implementing the actions envisaged in the National Forestry Strategy
- promoting a real sustainable forest management model (at European level) so not to remain locked-in to conservative approaches that do not favour carbon sequestration
- establishing a clear medium- to long-term forest management policy
- identify a framework for the promotion of thermal energy from renewables, including collective self-consumption
- allocating specific resources present in the National Recovery and Resilience Plan (NRRP) with regards to circular economy measures to forest management and maintenance interventions
- increasing the resource ceiling for the development of biomass district heating systems
- raising awareness for the end consumer about replacing outdated or inefficient appliances with new 4- to 5-star appliances or connecting to district heating networks.

The roadmap acknowledges the complexity of transitioning to bioenergy communities and emphasises the importance of proper legislation and support for local initiatives. Tailored, frameworks, financial risk mitigation, and awareness campaigns are needed to promote the growth of bioenergy communities in Europe. Engagement, clear communication, and access to information are crucial for successful implementation.

Purpose and development of the roadmap

The community bioenergy potential in Italy is untapped, despite its potential to decarbonise the economy, lower energy bills and increase energy independence.

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. This roadmap outlines the opportunities of community bioenergy for Italy 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.

This roadmap has been developed based on extensive policy analyses, surveys and direct evidence from regional actors who aim to implement community (bio)energy. This work involved detailed analyses of National Energy Climate Plans, National Renewable Energy Action Plans, and relevant legislative, policy, regulatory and strategic documents. We also surveyed stakeholders and participants working with the BECoop project.

In addition, we held a national policy workshop to discuss and validate the policy roadmap with key actors in the community energy-field in Italy. The policy workshop was held at the NOI Techpark in Bolzano on the 21st of April 2023 (Figure 3). The event was attended by 50 people, ranging from enterprise and cooperative representatives to journalists and public officials. Key areas of action and measures to foster bioenergy communities were discussed, with the aim of raising awareness among political representatives of the opportunities related to bioenergy.



Figure 3 - Speakers and participants at the BECoop national policy workshop in Italy.

The experience of regional actors who have implemented or want to implement community (bio)energy has also influenced the development of the policy roadmap. The BECoop network also provided useful feedback on previous versions of the policy roadmaps.

The roadmap is structured as follows: Firstly, it outlines the initial situation of community bioenergy in Italy – where we stand today. Second, it presents the targets and visions for (community) bioenergy in 2030 and 2050 – where we want to go. Third, it draws concrete policy recommendations to unlock the community (bio)energy potential in Italy – how do we get there by 2030/2050. A timeline with concrete measures and their prioritisation and sequencing is provided.



Community (bio)energy – current state of play

Status of community (bio)energy projects in Italy

Energy communities were introduced into the Italian legal system through Decree-Law 162/19 (Article 42bis) and its implementing measures, such as ARERA's Resolution 318/2020/R/eel and Ministerial Decree of September 16, 2020.

The renewable energy community must meet the following requirements: to be an autonomous legal entity which, acting in its own name, can exercise rights and be subject to obligations, having as its main corporate purpose (as evidenced by the Articles of Association) that of providing environmental, economic or social benefits at community level to its shareholders/members and/or to the local areas in which it operates. Additionally, rather than financial profits, it must have a statute or an instrument of incorporation providing participation in the open and voluntary community.

The Italian legislative framework

The Renewable Energy Directive (RED) delineated by the European Commission, provides a definition of renewable energy communities including, and referring to, electricity, thermal energy, and cooling energy produced from renewable energy sources (RES). On the other hand, the Italian government incorporated only electricity in the definition of renewable energy communities, hence de facto ruling out those communities producing and utilising thermal and cooling energy produced from RES; thus, also limiting the number, and source/end-use, of renewable energy communities. Therefore, since heating is not mentioned in the definition, only electricity is incentivised in collective self-consumption. Hence, no adequate economic support mechanisms are available for RES heating. Additionally, only the cooperative or association form is identified in the governance model, excluding the "benefit society" formula.

Another major gap is the lack of data on the heating and cooling market broken down by renewable source. The gas import figure is certain, while the diversification of final consumption in the heating sector is extremely fragmented. As a result, it can happen that the legislature intervenes in the RES heating sector without a holistic vision and approach.

Value and supply chains are integrated at the local level, while in terms of ministerial responsibility, the national forestry strategy is managed by the Ministry of Agriculture and the bioenergy sector by the Ministry of Environment.

Key barriers and challenges for community bioenergy

The main barrier to community bioenergy in Italy is that the condominium-sized energy community is intended only for electrical generation. Even in the governance model, there are risks related to envisioning community bioenergy only as cooperatives or association forms. Another challenge is the high importation levels related to biomass in Italy², over the last few years, the trend of Italian imports of assortments potentially destined for energy purposes has been continuously growing, reaching a value of 3.8 Mt in 2013. By virtue of this trend and these values, Italy is the number 1 global importer of firewood, the 3rd largest importer of pellets for civil use and wood residues and waste, and the 12th largest importer of wood chips from coniferous. Due to this high import dependence, there are risks of energy inefficiency in the transport of biomass and consequent emissions of greenhouse gases in the atmosphere, inactive management of national forest resources, and the risk of stimulating the creation of oversized plants compared to the supply of biomass on a local scale. Thus, the main challenge is to place a medium- to long-term forestry policy and increase timber harvests.

²<http://www.fao.org/forest-resources-assessment/past-assessments/fra-2015/en/>

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

Energy produced from biomass can be one of the winning sectors to focus on encouraging greater diversification of energy supplies. Italy is a biomass-rich country and should strive to enhance the usage of these sources, particularly in the heating sector, which accounts for 50% of Italy's energy end-use. This would allow the country to tackle effectively the recent energy price increases and would also enhance local RES circular supply chains. In Italy, the annual accretion from woods and forests (36% of Italian territory), corresponds to **20 million tonnes per year**; potential agricultural pruning waste (vines, olive trees, orchards, straw) corresponds to **8,7 million tonnes per year**; urban green pruning of parks, boulevards, and gardens corresponds to **3 million tonnes per year**. This results in a total of **31,7 million tonnes per year** of biomass which, if properly utilised, would avoid an import of at least 13 billion cubic meters of natural gas, producing a financial windfall of about 37-45 billion EUR per year (at current prices) corresponding to a value equal to 35/40% of Russian gas import recorded in 2021.

Energy communities represent a new model for local energy production and management. To promote them effectively, it is necessary to simplify the current legislation and promote heating consumption. Especially for inland areas and mountainous areas that have substantial renewable sources (biomass, hydropower), it is crucial to encourage the implementation of renewable energy communities as a tool for local development and territorial preservation. Cogeneration should be promoted to use biomass for energy purposes.

Bioenergy communities in the National Energy and Climate Plans (NECPs)

Bioenergy communities are not specifically mentioned in the 2019 NECP and its draft revision, available in 2023 on the European Commission's website, nor in the 2010 National Renewable Energy Action Plan.

However, many elements of Italy's NECP (and the revision) highlight the drive to an energy transition, the circular economy, and related requirements for the development of the production system, with due regard for economic and social sustainability, aiming for carbon neutrality by 2050 and an invitation to strengthen the measures for the implementation of the INECP.

The 2019 NECP highlights a position paper issued by the Ministry of Agricultural, Food, Forestry, and Tourism Policies, focusing on the significance of the bio-energy sector due to its broad availability (including residual, agricultural, and forestry biomass, cover crops, and second-harvest crops), the timely utilisation for energy purposes, and its potential to mitigate climate change by removing CO₂ through biomass supply chains. Concerning electricity production, it is believed that current levels can be sustained until 2030. Regarding thermal energy production, the Ministry advocates for increased bioenergy input by 2030, relative to current levels, while promoting greater forest growth. Lastly, in the transport sector, the Ministry believes that the conditions are favourable for a determined effort to advance biofuels, especially agricultural and zootechnical biomethane.

The revised NECP emphasises that the most widely used renewable source in the heat sector is solid biomass (6.8 Mtoe), mainly in the household sector as firewood and pellets. The NECP also finds that heating and domestic hot water (ACS) supplied by heat pumps (2.5 Mtoe) are also very important, while contributions from other sources (geothermal and solar) are still limited. In the context of the circular economy, the NECP emphasises that the local biomass with a short chain traceability procedure meets favourable environmental, social sustainability and balance sheet criteria.

Italy's 2019 NECP discusses the environmental effects of biomass use in terms of emissions. The development of the heating RES sector is influenced by environmental issues associated with the impacts of emissions from pre-existing solid biomass-fired heating systems. Therefore, the installation of new biomass-fired heating systems must be targeted towards promoting high-efficiency systems that meet high environmental quality standards. Consideration should also be given to the possibility of introducing restrictions on new systems in areas characterised by critical air quality conditions. To stimulate the renewal of old systems using efficient, low-emission technologies, more stringent performance requirements on accessing incentives for biomass-fired heat generators will be introduced in the short term.

The 2019 NECP emphasises that Italy will aim to expand the use of efficient district heating and district cooling by relying on residual economic potentials. This is to be done in a manner consistent with related energy and environmental policy objectives, including reduced the demand for energy recovery from waste, and limiting the use of biomass to reduce emissions. Moreover, the role of bioenergy plants can also be understood as serving the very high level of development of non-programmable renewable energy. To this end, the existing production capacity of bioliquid installations also proves to be a useful source of transitional support, ensuring support for maintaining decarbonisation trajectories. The current situation of the biomass production stock is characterised by a capacity of approximately 4.100 MW of installations in operation by 2021.

The 2019 NECP does not particularly discuss the social benefits of biomass, apart from the reference concerning the local biomass supply. About biomass supply and the origin thereof, approximately 80% (in energy content) of biomass is domestic. Considering the stabilisation of consumption, this percentage should remain steady, or else slightly decrease, because of the projected increased degree of penetration of more highly efficient technologies, with the possibility of increasing the share of pre-processed fuels, such as pellets.

The revised NECP foresees multiple measures for the support of biomass production, including the promotion of certified biomass pathways for energy production, the introduction of more stringent performance and environmental requirements for biomass heat generators as well as a tax credit on supplied district heating networks with biomass and geothermal energy.

Italy indirectly considers energy communities by mentioning self-consumption systems. In both the 2019 and revised NECP, it is mentioned that the existing self-consumption structures may work alongside new forms of aggregation (such as, for example, the new figures of 'self-consumer' and 'energy community' established by the Clean Energy Package), which will require the definition of government instruments to ensure system security, consumer protection and the fair allocation of network and system charges. The rise of self-consumption will naturally be facilitated by technological developments able to deliver small and medium-sized production and storage systems, above all using renewable sources and high-efficiency cogeneration and entail smaller and smaller costs for users. It is highlighted that this is a development that should be supported through public policies enabling market actors to organise themselves based on efficiency criteria. To this end, the regulation of the new structures needs to be accelerated.

A policy scorecard was developed for Italy, based on the available data in the final draft NECP, while 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 3).

Table 3 - A policy scorecard for bioenergy community support – Italian NECP.

Element	Italy
Overall regulatory framework and support for 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 to support biomass as a whole
Social benefits of bioenergy community development	● Insufficient attention to the social benefits of bioenergy communities
Environmental benefits of bioenergy community development	● Detailed overview of environmental benefits of biomass use
Poverty alleviation (bioenergy communities)	● Link between energy poverty and bioenergy communities insufficiently developed
Energy community support	● Bioenergy communities specifically receive very limited attention and support in the NECP

Subsidies for biomass energy production in Italy

Subsidies for biomass energy production in Italy are only present at a national level. The Conto Termico provides incentives for interventions to increase energy efficiency and the production of thermal energy from renewable sources for small-scale installations. The beneficiaries are mainly public administrations (PAs), but also businesses and individuals, who will be able to access funds amounting up to 900 million EUR annually, of which 200 million EUR are allocated to PAs. The electricity incentive period for biomass producers ended³, with the feed-in tariffs ending in 2025. The operators are waiting the issuance of the FER 2 Decree which is foreseen to recognise the incentive on electricity production for new biogas/biomass plants. The supply chain will be influenced by the closure of national incentives, which will see a peak of expiry concentration in the period 2026-2028 which will affect 86% of the plants.

Possible limitations and drawbacks of bioenergy communities in Italy

Most biomass district heating plants are in mountainous or non-urban areas where short supply chains are possible. Nonetheless, it is possible to imagine district heating plants in urban areas as well, in terms of diversification of resources. Particulate matter produced from biomass combustion is a drawback which conditions economic policies both at regional and national levels.

Effects of the war in Ukraine on the policy debate in Italy

The use of woody biomass (wood chips, pellets, firewood) for domestic use has increased. Several manufacturing companies have switched from the use of gas/diesel to pellets or wood chips. In terms of the energy community, no war-produced effects were recorded.

³<https://www.gazzettaufficiale.it/eli/id/2011/03/28/011G0067/sg>

Recommendations for key policy measures – in the NECP and beyond

Forests cover more than 36% of the national land area and have a key role in climate change mitigation and adaptation, provide multiple ecosystem utilities, and can contribute to the development of the circular bioeconomy, particularly in inland and mountainous areas. The conservation of this valuable heritage must focus on management that protects the structural and functional diversity of forests within the framework of the Sustainable Development Goals of the UN 2030 Agenda, the European Green Deal, the European Forestry Strategy, and the national Forestry Strategy currently being implemented.

Against this backdrop, it is a priority to adopt a pragmatic approach to the use of forest resources, implementing the actions envisaged within the National Forestry Strategy. The forestry sector for years has been considered an appendage of the agricultural sector without recognising its strategic value in economic, environmental, and social terms for the national territory. A conservative and romantic approach in which “nature takes its course” has prevailed in public opinion and sometimes even among decision makers.



Needed regulatory measures

- ✓ From a general policy perspective: at the European level, promote a real sustainable forest management model as to not remain locked-in to conservative approaches that do not favour carbon sequestration.
- ✓ From a legislative perspective: establish a clear medium- to long-term forest management policy, identify a framework for the promotion of thermal energy from renewables, including collective self-consumption.
- ✓ From an economic perspective: allocate specific resources present in the National Recovery and Resilience Plan (NRRP) with regards to circular economy measures to forest management and maintenance interventions. Additionally, an increase in the resource ceiling for the development of biomass district heating systems is needed.



Funding requirements and capacity

- ✓ On December 23, 2022, the Ministry of Environment, and Energy Security (MASE) published the rankings of approved projects related to Measure M2C3- Investment 3.1- Promoting Efficient District Heating Systems of the NRRP. The Call for Proposals was met with strong interest from operators: 118 projects were submitted for start-up and extension of efficient district heating systems, reflecting a fermenting, capital intensive and low-risk business sector.
- ✓ Of the 118 projects submitted, 29 were eligible for funding, 60 were assessed as eligible, however not eligible for funding due to exhaustion of funds, and the remaining 29 were excluded from the ranking list. The measure includes an allocation of 200 million EUR against a request for contributions of about 556 million EUR. The 60 positively evaluated projects excluded due to lack of financial resources amount to 233 million EUR. It should be noted that the value of the submitted projects corresponds to about 2 times the value of the requested funding; therefore, the total value of the 79 approved projects is about 1.1 billion EUR. Through measure M2C3 - Investment 3.1, resources amounting to approximately 0.4 billion EUR will be mobilised.

- ✓ The data confirm the paucity of resources allocated to the promotion of efficient district heating development within the NRRP compared to the sector's potential. The need to invest more resources on the promotion of district heating renewable sources is in line with other European countries, including the German government, which has allocated 2.9 billion EUR to the cause, and the Swiss government, with about 1 billion CHF.



Need to improve the social perception

- ✓ It is essential to raise awareness among end consumers about replacing outdated or inefficient appliances with new 4- to 5-star appliances or connecting to district heating networks. Also, in terms of culture, a communication campaign explaining the importance of managing the forest heritage through sustainable management and scheduled withdrawals is vitally needed.

Timeline of measures

Starting from the indications of RED 3, it is a priority to invest in the biomass-energy supply chain to address the emergency that Italy's forestry heritage is experiencing due to various disasters, such as bark beetle and drought. Only through concerted and coordinated action within the framework of the National Forestry Strategy can we act effectively and prevent further environmental risks.

Organisations such as FIPER (La Federazione di Produttori di Energia da Fonti Rinnovabili), will facilitate exchange and dialogue among all the actors involved to achieve an important common goal.

To summarise, an improvement of the social perception related to bioenergy and bioenergy communities is immediately needed. We propose to do this by:

- The development of a government-led, national communication campaign, with emphasis on the management of forest heritage.
- Raising awareness among end consumers about the benefits of switching to up-to-date appliances utilising bioenergy.
- Improving education and training processes to integrate biomass and energy community knowledge across the entire education sector.

Additionally, funds of the NRRP related to forest management and maintenance need to be released immediately. Thereafter, by 2025, financial support to start-ups and pilot projects involved in bioenergy needs to be provided. This should ideally be supported by a real sustainable forest management model at European level. Finally, by 2030, a clear forest management policy should be established, and district heating promoted, by setting concrete targets for the establishment of bioenergy communities.

The sequencing of these measures is outlined in Figure 4, across four domains as identified through the stakeholder consultation process: social perception, regulatory framework development, local diffusion, and heat decarbonisation.

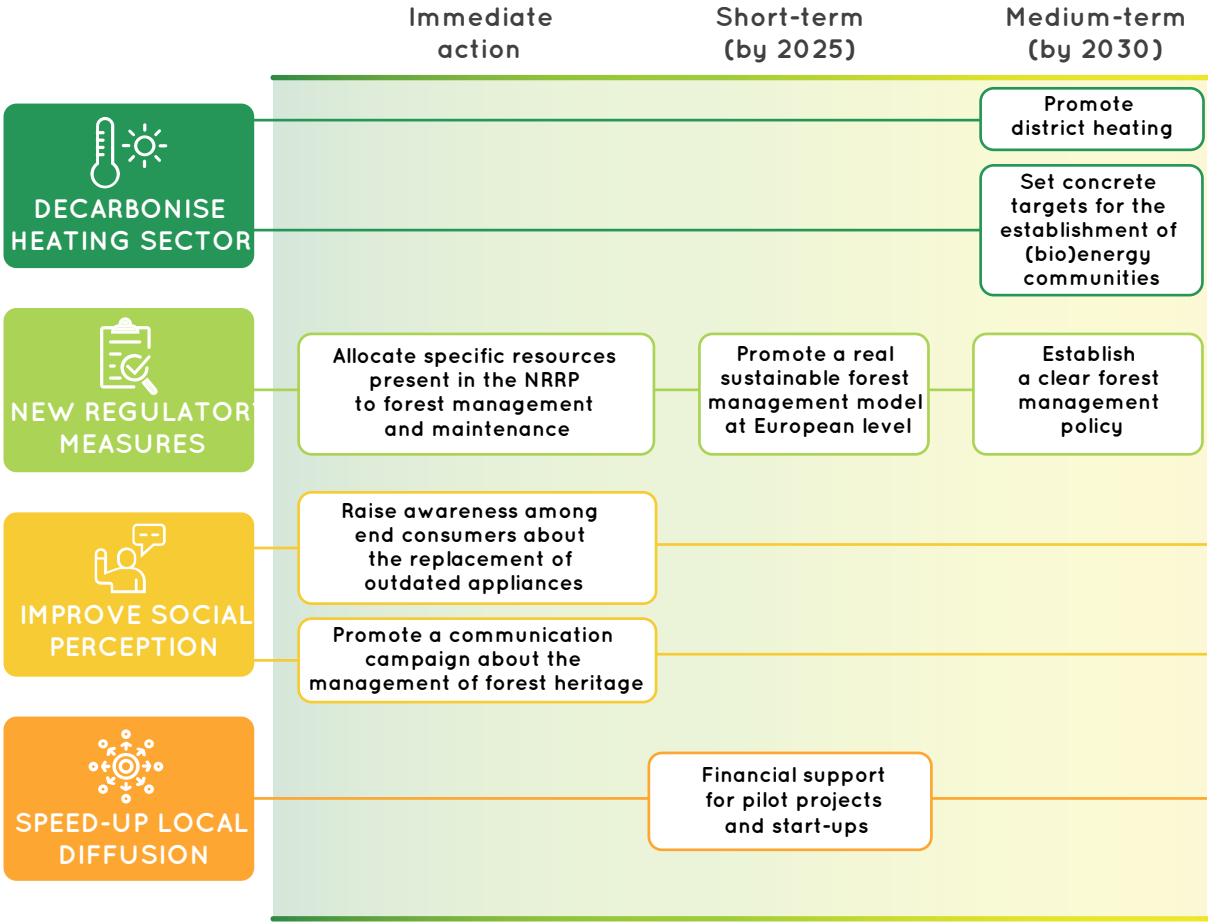


Figure 4 - Proposed policy roadmap for the acceleration of bioenergy communities in Italy.



Conclusions

The production of biomass energy can increase in both the short- and long-term through a unified approach in the implementation of the forestry strategy. Cascading employment requires the Ministry of Agriculture, Food Security and Forestry to promote a biomass-energy supply chain.

To summarise, the key elements those future policies, including the NECP, should consider in relation to bioenergy communities in Italy include: RES heating valorisation; the use of woody biomass; and the implementation of the national forestry strategy. In terms of the NECP specifically, there is significant room for improvement in developing the social benefits of bioenergy communities via public campaigns and educational systems.

Across all areas of action, there is a need for a clear definition and regulatory framework to support bioenergy communities specifically. Although energy communities are discussed indirectly in the NECP, not many details are defined, even when directly mentioned, especially in relation to biomass. In particular, the social and political benefits of energy communities require further attention, as exemplified by the fact that energy poverty alleviation is barely mentioned in relation to energy communities in the NECP.