

BIOMETHANE  
A COMMUNITY-BASED  
RENEWABLE ENERGY SOLUTION

The role of biomethane in fostering resilient  
renewable energy communities

# By 2050, energy communities could **produce up to half** of the EU's renewable energy

Energy communities are legal entities that enable **citizens, small businesses, and local authorities to produce, manage, and consume their own energy**. These communities are one of the key elements for the EU's energy transition. By 2050, half of Europe's citizens could be producing up to half of the EU's renewable energy. These communities provide a platform for individuals, businesses, and local authorities to actively combat climate change and support the shift towards a renewable, resilient energy infrastructure. By empowering citizens to take an active role in the energy transition, **energy communities offer a way to reshape our energy systems**.

## THE BENEFITS OF ENERGY COMMUNITIES



### ENVIRONMENTAL

Reducing carbon emissions & increasing energy efficiency



### ECONOMIC

Supporting the local economy, creating jobs and lowering energy bills



### SOCIAL

Fostering renewable energy acceptance & promoting participation in the green transition



# Integrating **biomethane could play a pivotal role** in strengthening energy communities





Energy communities are growing rapidly in Europe, primarily focusing on solar and wind power. Integrating sustainable biomethane can play a pivotal role by directly replacing fossil fuels and helping to reduce CO<sub>2</sub> emissions. This integration offers multiple benefits: promoting economic growth, supporting environmental sustainability, and enhancing energy security. Technical estimates outline the following theoretical scenario:



**Biomethane plant in an energy community**  
producing 500 Nm<sup>3</sup>  
of green gas per hour



## Energy community benefits

-  Energy for **3,973** households
-  Creation of **64** new jobs
-  Produce **606 tons** of organic fertiliser
-  Prevent **21,168 tons** of CO<sub>2</sub> emissions annually

## How to make this happen

To make this happen, we need to reach out to the communities, show the benefits of biomethane and create together access to the various waste streams, agricultural residues and sustainable biomass.

We need to mobilise all local actors that are key players in making energy communities work and can help set up reliable supply chains for sustainable biomethane, turning waste and agricultural residues into useful green energy.





# Unlocking **resilient energy communities** with biomethane

The unique features of the biomethane sector make it a valuable energy source for developing successful and resilient energy communities. The biomethane sector can offer many advantages:



**Creation of local supply chains:** Given its connection to agriculture and local waste, this sector is perfect for fostering energy communities reliant on nearby resources, thus facilitating the development of decentralized and self-sufficient supply chains.



**Rural development:** Introducing a decentralized model has the potential to spur growth in rural areas, generating employment opportunities and bolstering the economic landscape for farmers.



**Cost reduction for farmers:** Offering a cost-effective waste management solution and a reliable source of organic fertilizer, the sector can directly alleviate financial burdens for farmers.



**Circular economy and environmental protection:** By bolstering the circularity of local communities, this sector can deliver substantial environmental benefits, reducing waste and mitigating GHG emissions.



**Energy security contribution:** The sector can contribute to energy accessibility and affordability by directly reducing energy costs for the community, but it can also foster awareness and raise the level of commitment among citizens towards the energy transition, enhancing overall energy security.



**Community engagement and networking:** By fostering strong networks among all different stakeholders involved, the sector ultimately helps create more resilient and cohesive communities.

# What is **sustainable biomethane**?

Under the REPowerEU Plan, the European Commission has set a target to produce 35 billion cubic meters (bcm) of sustainable biomethane\* annually by 2030. This goal aims to provide a renewable and local source of gas to replace fossil natural gas in various economic sectors.

Biomethane offers numerous environmental, economic, and social benefits, including:



## **Use of sustainable feedstock and circularity potential:**

Biomethane can be produced from household organic waste, industrial waste, agricultural residues and sustainable forms of biomass. This not only provides an effective waste management solution but also promotes circularity by converting waste materials into valuable energy resources.



**Emission Reductions:** Biomethane can replace fossil fuels in multiple sectors, thereby reducing greenhouse gas (GHG) emissions and directly contributing to the energy transition. Additionally, using digestate as a fertilizer further reduces GHG emissions by replacing synthetic fertilizers' production.



**Decentralized production model:** Given the close link to the agricultural sector, biomethane production can foster new job opportunities and economic development in rural regions.



**Organic Fertilizer:** Its production process naturally generates digestate, an organic fertilizer that can be used in agriculture to replace synthetic fertilizers enhancing soil health and restoring degraded soils.



**Decarbonization of industrial CO<sub>2</sub> use:** Biomethane production involves the separation of pure biogenic CO<sub>2</sub> from methane. This CO<sub>2</sub> of biological origin can replace fossil-derived CO<sub>2</sub>, needed in various industrial applications, and contribute to GHG removals.



**Energy Security:** EU-produced biomethane reduces dependence on gas imports, improves Europe's energy security, mitigates energy prices, and offers a tangible solution for energy poverty. There is a substantial potential available providing European form of green gas made by European technology.

\* [Biomethane is the purified form of biogas, consisting of nearly 100% green methane, making it suitable for injection into the natural gas grid or use as a vehicle fuel. It is a direct and sustainable alternative to fossil natural gas with a below zero emission profile and is the cheapest and most scalable form of renewable gas today.]

## Want to know **more**?

Interested in learning more about biomethane and energy communities, and the numerous benefits, scan the QR code to learn more about this topic! On a dedicated webpage you can read additional information, take a deep-dive in useful links and sources, and download more materials.

The **Biomethane Industrial Partnership** is a private-public partnership, comprising the European Commission, Member States, industries, academia & civil society who team up in several Task Forces to achieve 35 bcm biomethane by 2030. Interested in becoming a member, discovering our publications, or attend an event? Check out our website or send an email to the BIP secretariat!



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