

# Bioenergy Landscape

Energy has gained newfound importance in European policy as the EU has sought to ease market pressure, avoid disruptions in supply, and reform the entire energy system. In past years, the EU has dramatically increased the deployment of renewable sources and improved energy efficiency, but even more will need to be done to realize its ambitious climate targets while also ensuring affordable, reliable, and accessible energy for households and enhancing the competitiveness of its industry. The only way to achieve these diverse objectives is to support investments in clean technologies including bioenergy from solid biomass.

## Readily available solution for EU energy security

Bioenergy is already playing a significant role in the energy transition, helping to reduce reliance on fossil fuels and curb fossil greenhouse gas (GHG) emissions.

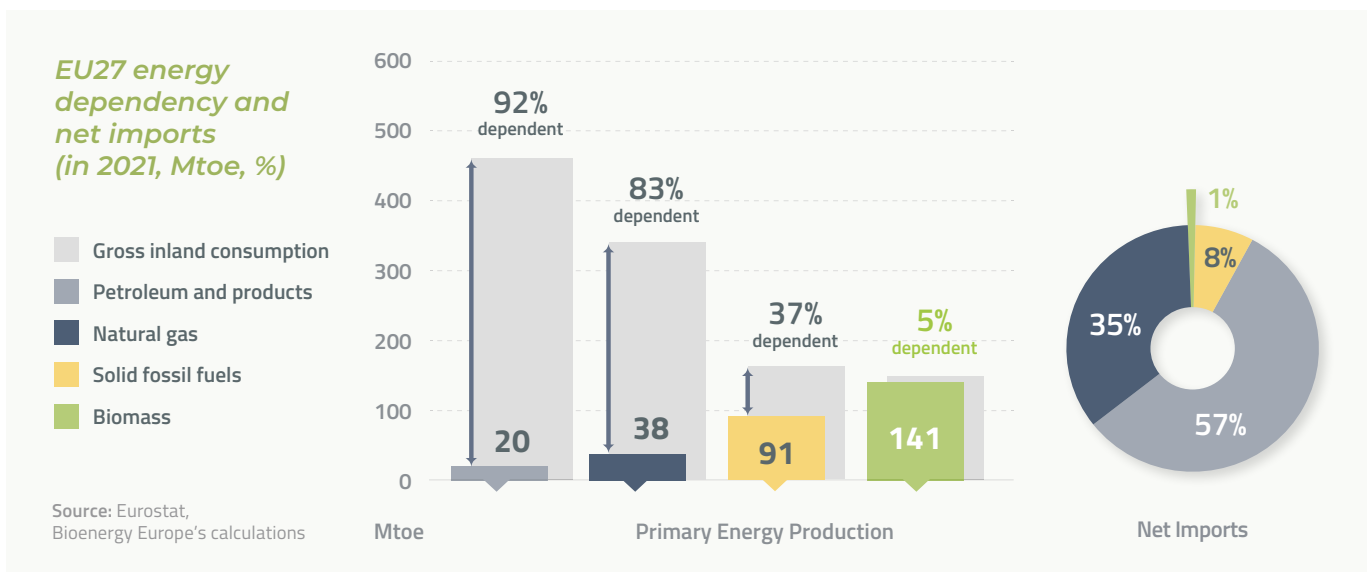
By integrating sustainable bioenergy into the broader energy strategy, countries can enhance energy security, reduce negative environmental impacts, and promote economic development. Russia’s invasion of Ukraine has revealed the EU’s dependency on foreign fossil fuels and highlighted the need to secure the autonomy of our energy system. High energy prices and the risk of supply shortages have made the acceleration of the green and digital transitions even more urgent, to ensure a secure, more affordable, resilient, and independent energy system.

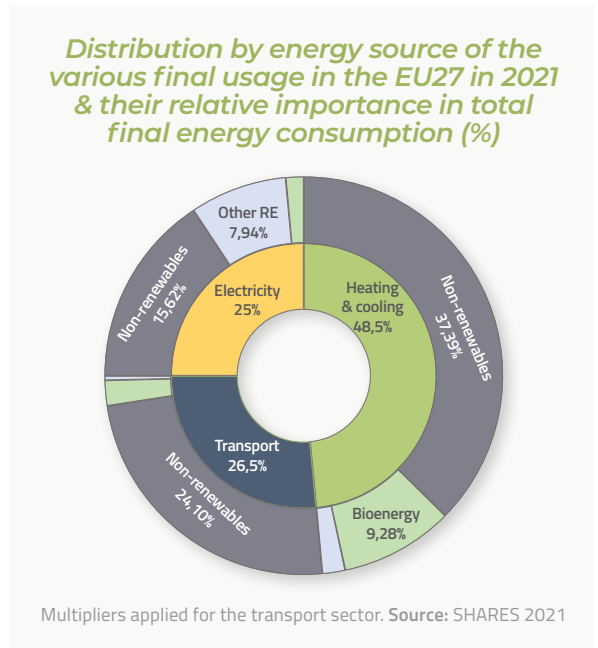
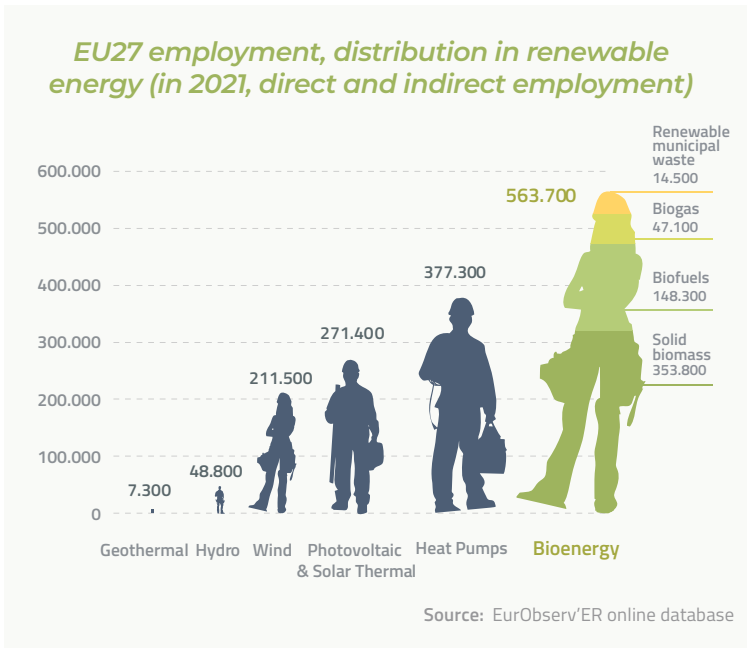
The import dependency of bioenergy remains very low (4,7%), especially compared to fossil fuels which in some case the EU is almost entirely dependent on imports. Biomass offers a domestically sourced alternative that can contribute to energy security. By harnessing wood, agricultural byproducts, and waste materials for energy production, the EU can reduce its reliance on imported fossil fuels while diversify its energy mix and achieving its energy and climate goals.

## Bioenergy: an affordable solution creating jobs for the green transition

Bioenergy’s manufacturing value chain is solidly based in the EU. Bioenergy has the largest direct and indirect employment of all renewable sources, bioenergy accounts for 563.700 jobs. In 2021, the overall turnover of bioenergy represented €58,5 bn in the EU27. Solid bioenergy experienced strong growth in recent years, increasing turnover by over 50% in a decade to go from €25 bn in 2010 to approximately €38,5 bn in 2021 within the EU27.

When looking at the EU energy mix, bioenergy plays an important role and makes up 55,7% of all renewables and 11,4% of the total energy. The contribution varies greatly in the different uses of energy. While bioelectricity still plays an important role and biofuels are relatively very important in terms of renewable transport, the greatest contribution of bioenergy comes in the form of renewable heating. Overall, the entire energy system continues to be dominated by non-renewable sources.





### Biobased carbon removal

In line with the 2015 Paris Agreement's, the EU has committed to ambitious environmental targets, including sharply slashing GHG emissions, and reaching climate neutrality by 2050. The Intergovernmental Panel on Climate Change (IPCC) states that it is very unlikely to reduce global warming to 1.5°C unless we drastically cut emissions now and compensate hard-to-abate residual emissions with carbon dioxide removals.

Biobased carbon removal technologies, such as Bioenergy with Carbon Capture and Storage (BECCS) and biochar, offer promising avenues to actively draw down atmospheric carbon dioxide. BECCS is an industrial technology capable of capturing and permanently storing carbon and one of the most cost-competitive and developed technologies for negative carbon dioxide emissions. However, despite its efficacy, the costs associated with implementation

of this technology are still considerably higher than the production of bioenergy without BECCS.

To enable the deployment of BECCS on a large scale, there must be a functioning market or framework for carbon removals, and this will require new economic instruments including strategic investments. Robust monitoring, reporting and verification rules are still lacking, and are necessary for the successful upscaling of carbon removals.

The EU needs a trustworthy system to quantify removal so that it can achieve climate neutrality by 2050 and net negative emissions thereafter. An EU certification framework needs to be built to facilitate private fundings of carbon removal activities and transition from exploratory projects to full-scale industrial deployment. In parallel with public funding, voluntary carbon markets are expected to play a greater role in the business case for biobased removal projects in the future.

### Key Messages

1. The EU needs to incentivise domestic renewable sources, such as sustainable bioenergy and set clear fossil fuels exit strategy to increase its energy security.
2. Bioenergy is one of the few available solutions for decarbonising energy-intensive industries where high temperatures and pressure are required. A suitable policy framework promoting synergies between bioenergy and the industrial sector should be further developed.
3. Carbon removal activities will be needed to achieve the EU's carbon neutrality target. To this end, investing in negative emissions technologies, such as BECCS and biochar, should become a priority and clear targets must be set at EU level.