

# Bioenergy in Europe

## OVERVIEW

Biomass is an essential renewable energy source and is a key factor in reaching the European climate targets in 2020 and towards 2030, where 32% of the energy consumption within the EU must originate from renewable energy sources. The EU Member States follow distinctive paths to meet their obligations, which are defined in national action plans, according to the respective energy markets and available resources. In 2018, the share of renewable energies in the EU amounted to 18.9% of the gross final energy consumption (Eurostat, 2020).

With a share of more than 58% of the energy consumption from renewable energy sources, biomass constitutes the main renewable energy source within the EU (Figure 1).

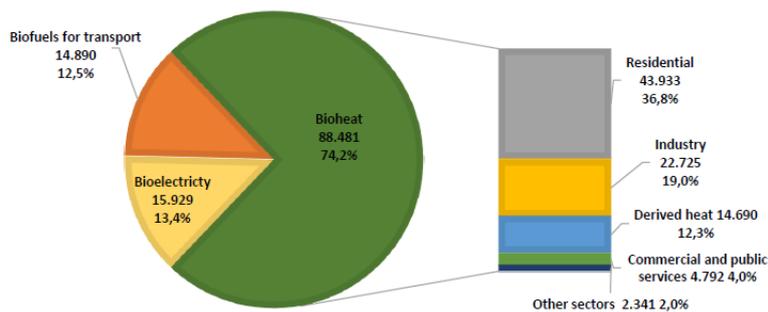


Figure 1: Gross final energy consumption of biomass in heat, electricity and transport in the EU28 in 2017 (ktoe), Source: Bioenergy Europe, Eurostat

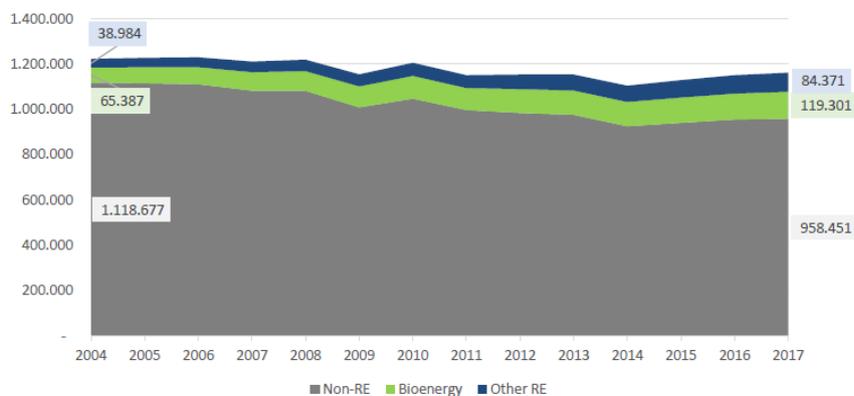


Figure 2: Gross final energy consumption by fuel type in EU28 (ktoe), Source: Bioenergy Europe, Eurostat

In 2017, heat generation amounted to 74.2% of the gross final energy consumption of bioenergy in the EU, while electricity had a share of 13.4% and biofuels amounted to 12.5% (Figure 2). Bioenergy plays an important role to decarbonise the heating and cooling sector, which represented almost half of the overall final energy consumption within the EU in 2017. Thereof, the utilisation of biomass for heating purposes that was consumed by the residential sector accounted for approx. 18% of the entire heating energy demand within the EU28.

## BIOMASS SUPPLY

The main type of biomass used for energetic purposes is solid biomass, accounting for 70% of the total primary energy production of biomass. Biogas amounts to 12% of the primary energy production of biomass, liquid biofuels for 11%, and energy from the renewable fraction of municipal waste to 7% in 2017 (Figure 3).

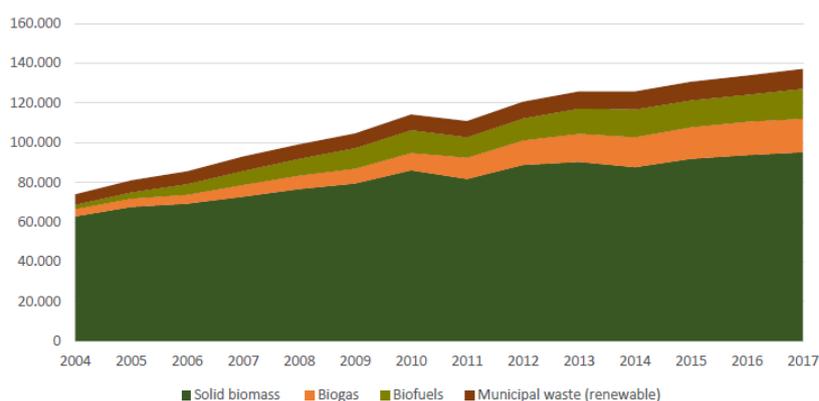


Figure 3: Primary energy production of biomass by type (ktoe) in EU28, Source: Bioenergy Europe, Eurostat

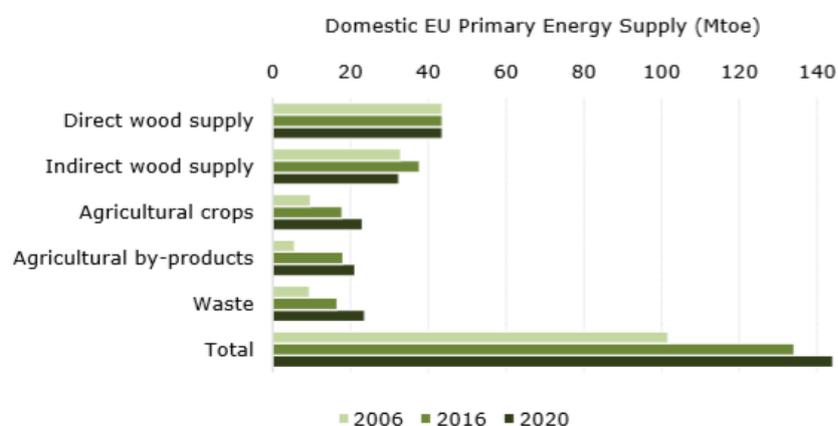


Figure 4: Domestic biomass supplied for energy in 2006, 2016 and projections for 2020, Source: EC Knowledge Centre for Bioeconomy

The supply of domestic biomass for energetic purposes from the forestry sector amounted to over 60% in 2016, whereof 32.5% were constituted by direct supply of wood biomass from forests and other wooded land, and 28.2% by indirect supply of wood (Figure 4). Agricultural crops and agricultural by-products accounted for 27% of the domestic biomass supply, waste (municipal, industrial, etc.) for 12% (European Commission's Knowledge Centre for Bioeconomy, 2019).

Agricultural crops constituted the largest source of feedstock for biofuel production (72% of approx. 14 Mtoe used in transport in 2016), with various waste products and residues contributing to the remainder (28%). With an import rate below 7%, the majority of the biofuels were produced from domestic feedstock. In general, the dependency on bioenergy imports in the EU amounts to 4.6% in comparison to 78% in case of oil and petroleum products, solid fossil fuels and natural gas. Bioenergy carriers remain to be a rather local source of energy in the EU with trade flows primarily between Member States. Therefore, it is required to harmonise the sustainability criteria and quality standards continuously within the EU (European Commission's Knowledge Centre for Bioeconomy, 2019).

## BIOMASS CONSUMPTION

France, Germany, Italy and Sweden are the largest consumers of bioenergy in the EU in terms of gross inland consumption, considering both domestic production and imports of bioenergy carriers. Contrary, the Scandinavian and the Baltic countries as well as Austria have the highest consumption of bioenergy per capita. In many EU Member States, wood is the most important renewable energy source. Latvia (29%), Finland (24%), Sweden (20%), Lithuania (17%) and Denmark (15%) show large shares of wood and wood products in gross inland energy consumption. Solid biomass is used by large amounts by households and other final consumers (industries, services, agriculture/forestry) (European Commission's Knowledge Centre for Bioeconomy, 2019).

## ROLE OF BIOENERGY IN THE FUTURE

Bioenergy can play a significant role in achieving the EU targets in terms of renewable energies by 2030 and beyond. According to the mitigation scenario of the European Commission as depicted in Figure 5, the gross inland bioenergy consumption by 2050 will amount to between 170-252 Mtoe. Opportunities to increase the utilisation of bioenergy are seen e.g. in the field using agricultural residues, by-products and waste. Bioenergy can also play an important role as a flexible energetic carrier to balance the power systems and thus allowing for higher shares of renewable energy sources as wind and solar power.

When ensuring environmental aspects like securing biodiversity or maintaining ecosystem services, bioenergy can contribute to, among other things, greenhouse gas savings, sustainability and rural development.

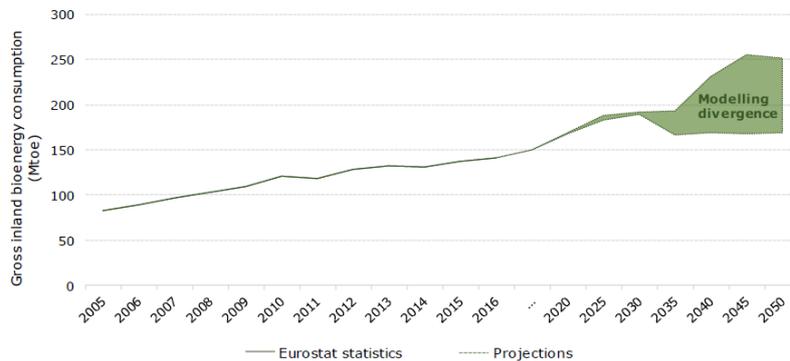


Figure 5: Gross inland bioenergy consumption and projections until 2050 based on mitigation scenarios, Source: Eurostat and EC 2018

## SOURCES

- Bioenergy Europe, 2019: Report Bioenergy Landscape. Link: <https://bioenergyeurope.org/article.html/215>
- European Commission's Knowledge Centre for Bioeconomy, 2019: Brief on biomass for energy in the European Union. Link: [https://publications.jrc.ec.europa.eu/repository/bitstream/JRC109354/biomass\\_4\\_energy\\_brief\\_online\\_1.pdf](https://publications.jrc.ec.europa.eu/repository/bitstream/JRC109354/biomass_4_energy_brief_online_1.pdf)
- Eurostat, 2020. Renewable energy statistics. Link: [https://ec.europa.eu/eurostat/statistics-explained/index.php?title=Renewable\\_energy\\_statistics#Consumption\\_of\\_renewable\\_energy\\_almost\\_doubled\\_between\\_2004\\_and\\_2018](https://ec.europa.eu/eurostat/statistics-explained/index.php?title=Renewable_energy_statistics#Consumption_of_renewable_energy_almost_doubled_between_2004_and_2018)

## FURTHER INFORMATION

- Lists off current demonstration and first commercial facilities for the production of advanced biofuels in Europe