

This report was prepared from the 2018 OECD/IEA World Energy Balances, combined with data and information provided by the IEA Bioenergy Executive Committee and Task members. Reference is also made to Eurostat. All individual country reports were reviewed by the national delegates to the IEA Bioenergy Executive Committee, who have approved the content. General background on the approach and definitions can be found in the central introductory report¹ for all country reports.

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NATIONAL POLICY FRAMEWORK IN ESTONIA

Estonia has committed itself to a target of 25% share of renewable energy in gross final energy consumption in 2020, with a split in sectors as displayed in the table below. Estonia has reached the overall target already in 2011 (25.5%).

Table 1: Estonia's 2020 renewable energy targets.

Sector	Share in gross final consumption per sector
Overall target	25%
Heating and cooling	38.4%
Electricity	17.6%
Transport	10%

Source: National Renewable Energy Action Plan of Estonia (2010)²

The National Renewable Energy Action Plan until year 2020 is a comprehensive document summarizing the national renewable energy policies, forecasting final energy consumption and setting out renewable energy targets and forecast trajectories until 2020.

Additionally, Estonia launched in 2017 the National Development Plan of the Energy Sector until 2030, which describes the objectives of Estonia's energy policy until 2030, the vision for the energy sector until 2050, as well as the overall and specific targets and actions to meet them.

¹ Available at <https://www.ieabioenergy.com/iea-publications/country-reports/2018-country-reports/>

² <https://ec.europa.eu/energy/en/topics/renewable-energy/national-action-plans>

A description of fiscal and non-fiscal supports for bioenergy development is available at: <http://www.iea.org/policiesandmeasures/renewableenergy/?country=Estonia>

TOTAL PRIMARY ENERGY SUPPLY (TPES) AND THE CONTRIBUTION OF BIOENERGY

The total primary energy supply of Estonia in 2016 amounted to 231 petajoule (PJ) and is dominated by oil products (175 PJ), which represents over three quarters of TPES. Natural gas represents 7% (18 PJ). Renewable energy sources have a share of 17.5% or 40 PJ – 16.5% bioenergy and 1.0% other renewable energy sources. 7 PJ of electricity is exported, which represents 3% of Estonian TPES.

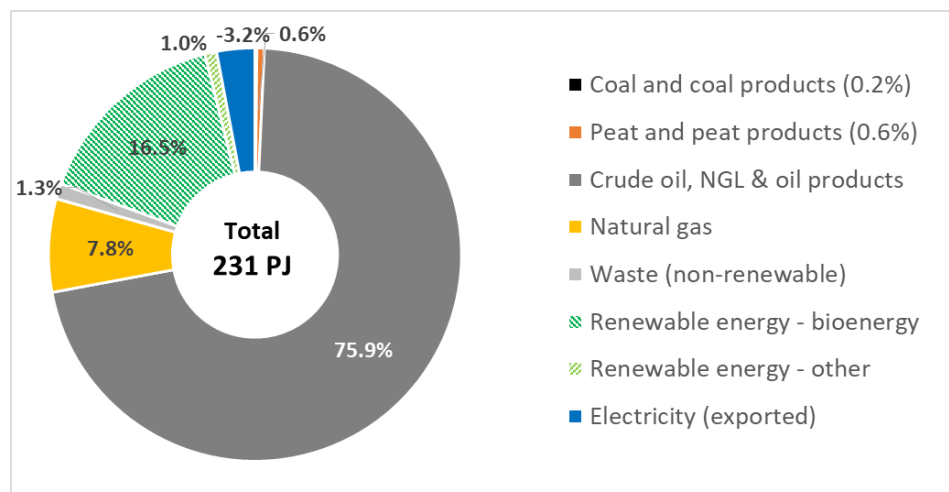


Figure 1: Total primary energy supply in Estonia in 2016 (Source: World Energy Balances © OECD/IEA 2018)

Compared to 5 years earlier (2011) the share of oil products decreased from 80.2% to 75.9 and natural gas decreased from 8.9% to 7.8%. In the same period renewable energy increased from 14.8% to 17.5%.

The total primary energy supply of renewable energy sources is predominantly covered by energy from biomass, with 95%. Wind energy amounts for 5%, while other renewable energy forms are not significant.

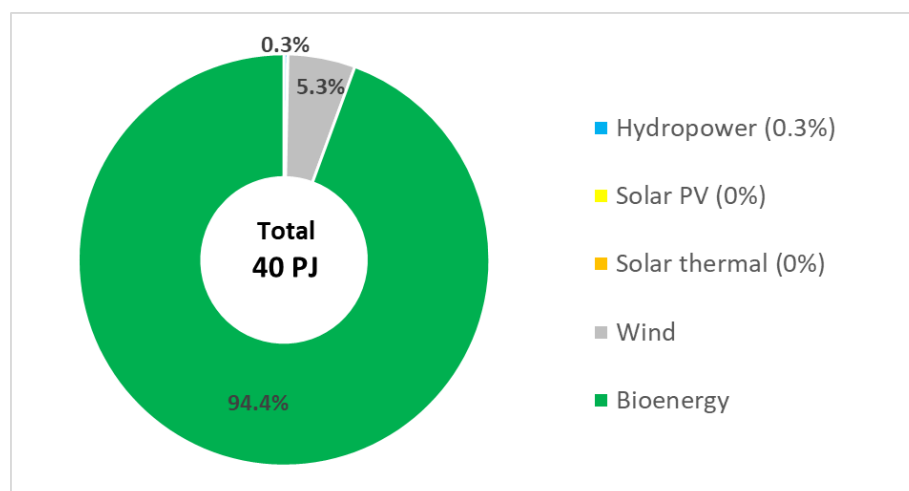


Figure 2: Total primary energy supply of Renewable Energy Sources in Estonia in 2016 (Source: World Energy Balances © OECD/IEA 2018)

More than 98% of the bioenergy consumed in Estonia comes from solid biofuels (38 PJ), of which around 16 PJ is directly consumed in the residential sector. The role of biogas (0.4 PJ) and biogasoline (0.1 PJ) is much smaller. Biodiesel and energy from municipal waste (MSW) are negligible.

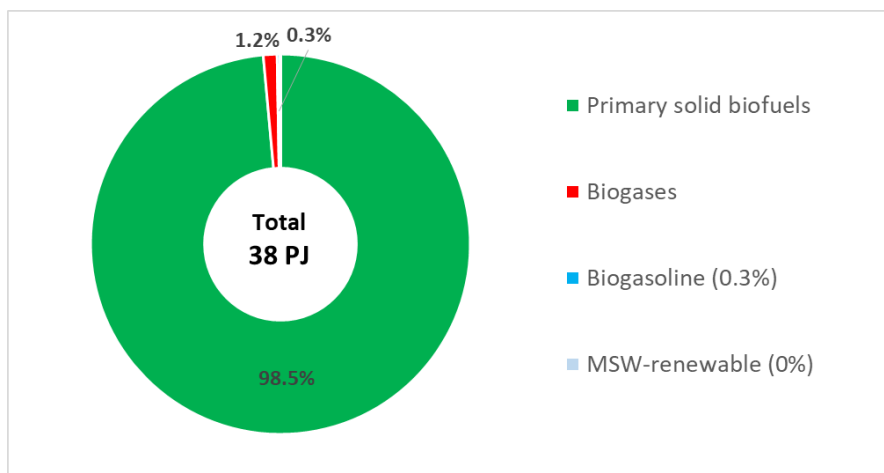


Figure 3: Total primary energy supply from bioenergy in Estonia in 2016 (Source: World Energy Balances © OECD/IEA 2018)

The role of bioenergy in Estonian TPES increased steadily from 2% in 1990 to almost 15% in 2010. From 2010 to 2014, bioenergy supply remained rather constant, around 33 PJ. Since 2015 there is a growing trend.

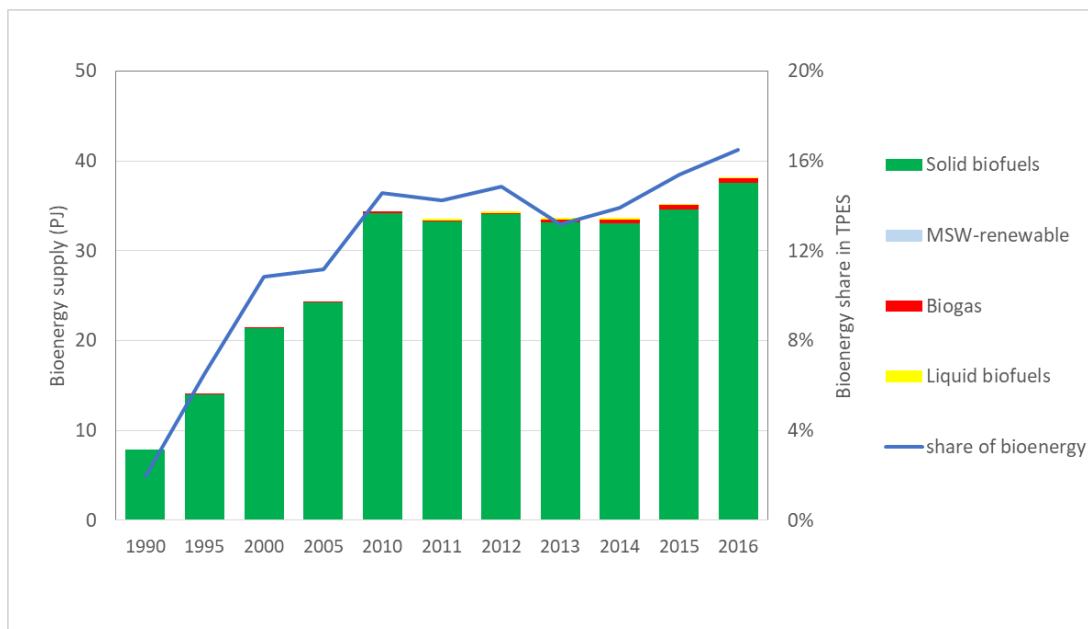


Figure 4: Development of total primary energy supply from bioenergy in Estonia 1990 – 2016 (Source: World Energy Balances © OECD/IEA 2018)

Table 2 expresses the 2016 TPES figures per capita, considering Estonia's population of 1.32 million people. Compared to the other 22 member countries of IEA Bioenergy (expressed per capita), Estonia ranks in the top 3 for solid biofuels, but at the low end for biogas and liquid biofuels. Energy from renewable MSW is underdeveloped compared to other countries.

Table 2: Total primary energy supply per capita in 2016

	GJ/capita
Total energy	175.1
Bioenergy	28.9
Solid biofuels	28.5
Renewable MSW	0.0
Biogas	0.3
Liquid biofuels	0.1

Source: World Energy Balances © OECD/IEA 2018

Role of bioenergy in different sectors

Estonia has a moderate share of renewable electricity, almost 60% of it comes from biomass.

The share of biofuels for transport amounts less than 0.5%, which is far below European average.

Overall, the direct share of biomass for heating in the different sectors is around 30%. In the residential sector direct use of biomass represents about half of fuel/heat consumption. Heat output generated and sold by CHP plants and heat plants represents around 34% of total fuel/heat provided, of which on average 54% is produced from biomass.

Table 3: Role of bioenergy and renewable energy in electricity production, transport energy consumption and fuel/heat consumption in 2016

Sector	Share of bioenergy	Share of renewable energy	Overall production/consumption
Electricity production	7.3%	12.4%	12.2 TWh (43.8 PJ)
Transport energy (final consumption)	0.3%	0.4%	33.2 PJ
Overall fuel and heat consumption³	Direct biomass: 29.5% Biobased heat: 18.4%	47.9%	58.0 PJ

Source: World Energy Balances © OECD/IEA 2018

³ This includes final consumption of fuels and heat in industry, the residential sector, commercial and public services and agriculture/forestry. Transport fuels are excluded. Energy used for transformation and for own use of energy producing industries is also excluded.

According to Eurostat⁴, the following renewable energy shares in gross final energy consumption were reached in Estonia in 2016:

- Overall share: 28.8%
- In heating and cooling: 51.2%
- In electricity: 15.5%
- In transport: 0.5%

Estonia has already reached its overall renewable energy target for 2020, also for heating and cooling (see Table 1). Electricity is on track. For transport major efforts are still to be made.

Mind that some of these figures can differ from the IEA derived data because of different accounting rules.

RESEARCH FOCUS RELATED TO BIOENERGY

Estonia is a biomass rich country and as bioenergy is a fast developing sector, Estonia wants to participate in EU's bioeconomy programmes and use a comprehensive approach to bioeconomy, the respective value chains and their interconnections to maximize benefits from bioenergy usage. Hence, Estonia has launched a research project with the objective to identify options for Estonia's bioeconomy and potential development of its main value chains and exploitation of bioresources to increase competitiveness of Estonia's bioeconomy. Research with the topic "Maximising added value and efficient use of raw materials in bioeconomy sectors" will be done with a view of increasing added value and efficient use of raw materials while adhering to the principles of sustainable development.

The research project sub-objectives are firstly, to analyse the current state of Estonia's bioeconomy based on an integrated approach to value chains. Secondly, to specify (alternative) scenarios to support strategic planning of the development of Estonia's bioeconomy. Thirdly, to develop value-chain-based business models in selected sectors. The analysis of business models supports efficient use of resources and maximisation of the added value of finished product and lastly to develop proposals on government measures and actions for the development of bioeconomy.

In conclusion, this work will result in the development of business models in selected sectors. The business models will be used by Estonian companies and policy makers for action planning and knowledge and evidence-based development of future policy measures.

In addition to the described research, Estonian government and enterprises have strong, supporting collaboration between R&D institutions and companies. Studies and surveys are ordered and carried out mainly relayed on a need-based approach. Most of the information about R&D institutions, researchers, research projects and various research results, can be found from the Estonian Research Information System.

RECENT MAJOR BIOENERGY DEVELOPMENTS

According to the target for the transport sector, specified in the EU Renewable Energy Directive (2009/28/EC), Estonia will have to ensure that 10% of energy used in the transport sector comes from renewable sources by 2020. The target can be met by using an optimal combination of two measures – the obligation to supply biofuels in the market of liquid fuels and promoting the use of biomethane in vehicles.

Biogas has large unused energy potential in Estonia and biomethane produced from biogas can be an important resource for increasing the use of renewable energy in the transport sector. The launch of

⁴ http://appsso.eurostat.ec.europa.eu/nui/show.do?dataset=nrg_ind_335a&lang=en

biomethane production will introduce a supply source produced from local raw materials to the gas market, and will open a new area for gas consumption in the transport sector. In 2018, two biomethane stations will reach full power and in the coming years at least 3 additional stations will start their biomethane production as well. Renewable fuel produced from local raw materials promotes sustainable regional development, diversifies the rural economy, and reduces dependence on imported fuel, while promoting distributed energy production and reducing environmental pollution.

Hence, Estonia joined with the IEA Bioenergy Task 37: Energy from Biogas, because the main objective of the Task work programme suits perfectly to Estonia's transport sector development plan (promotion of biomethane).

LINKS TO SOURCES OF INFORMATION

National Development Plan of the Energy Sector until 2030:

https://www.mkm.ee/sites/default/files/ndpes_2030_eng.pdf

Estonian National Sustainable Development Strategy "Sustainable Estonia 21":

https://riigikantselei.ee/sites/default/files/content-editors/Failid/estonia_sds_2005.pdf

Estonian Environmental Strategy 2030:

http://www.envir.ee/sites/default/files/keskkonnastrateegia_inglisek.pdf