Fact sheet on forest biomass in Estonia

Forest area	51,4 %
Share of protected forest	25 %
Share of strictly protected forest	14,1 %
Optimum harvesting level	12-15 mln m^3
Actual harvesting level (in period 2007-2017)	8,8 mln m^3
Growing stock in managed forests (in period 2007-2017)	12,8 mln m^3
Number of trees planted (2018)	In total 33,3 mln (21,3 mln state forests; 12 mln private forests)
Renewable energy share of gross final energy consumption	30%
Bioenergy share in renewables	Ca 80% (from electricity (CHP) ca 60% (1,2 TWh) and from heating ca 90% (10-11 TWh))

1. Biomass for energy (bioenergy) continues to be the **main source of renewable energy in Estonia** (ca 80%[1]).
2. Biomass usage in energy is regulated by **biomass sustainability criteria of the Renewable Energy Directive (EU 2018/2001) and the waste hierarchy.** Sustainable forest management involves all stages of forest growth including sustainable harvesting that is done taking into account prevention of habitats of flora and fauna and especially endangered species.
3. More than half of the **Estonian land territory (51.4%) is covered with forest land** and the forest land area has **increased during the last 70 years about 1.5 times** (Figure 1.). Partly by natural afforestation of meadows and pastures resulting in formation of deciduous and mixed stands, but also pine and spruce have spread on former arable land. The coniferous forests planted on arable land tend to suffer root diseases and therefore require more care or even removal. **The share of protected forests is high (25%), and the share of strictly protected forests is also high (14,1% according to NFI[2]).**

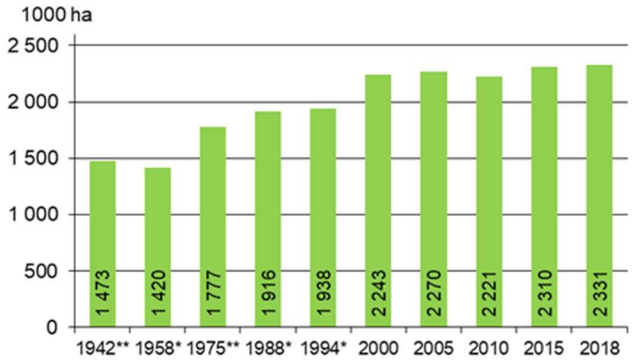

Figure 1. Changes of forest land area

4. In 2018, the total forest land area in Estonia was 2.33 million hectares and the total growing stock of stands was 480 million m3. In Estonia, there are mostly mixed stands that have an uneven age distribution, therefore the share of low quality wood is considerable. The total growing stock of stemwood, growing stock per hectare of forest area, as well as **the annual increment of growing stock has been increasing gradually since 2000**. For the last 15 years, the felling volume has been smaller than the increase of growing stock. For example in the period 2007-2017 the average felling

[1] Eurostat, renewable energy statistics: https://ec.europa.eu/eurostat/web/energy/data/shares
[2] Estonian Environment Agency: https://www.keskkonnaagentuur.ee/et/uudised/varsked-andmed-eesti-metsadest-mida-me-seal-naeme

volume has been 8,8 million m3 and the average annual increment of growing stock for the period in managed forests was 12.8 million m3[3]. **Forest growing stock has raised due to both increase in forest land area as well as its average age**. In addition, it is influenced by improved growth conditions resulting from the processes of human activities.

5. The "Estonian Forestry Development Program until 2020" specified that 12–15 million m³ per year is the optimum harvesting level. The planning of felling volumes is based primarily on the age structure of forests available for wood supply. Forest data originates from Forest Register and National Forest Inventory, which are based on internationally recognized methodologies. The share of mature stands in Estonian forests is relatively large. In 2019 there was 2.0 million ha of forest available for wood supply in Estonia (86% of forest land), of which 25.5% are mature stands. As the private forest has not been renewed to the same extent with coniferous trees compared to the state forest, the reforestation of the private forest land is mostly in deciduous stands. **Hence, the share of low-quality wood in the forests is quite substantial.** Biomass fuels are produced from low-quality wood cleared from the forests to prevent the spread of pathogens and to encourage reforestation. Energy production helps to find a suitable and much needed use for such biomass.
6. **Approximately 36% of the wood biomass removals in Estonia is primarily used for energy and it mostly originates from low-quality wood and felling residues. If we include wood industry residues, the usage for energy forms altogether 60%[4]. Biomass used for energy is of the lowest quality and cost of the different wood products[5].**
7. In the period 2007-2017, the average felling volume in Estonia has been 8-9 million m3, tax revenue € 54 per cubic meter (total 475 mln eur) and the average total (direct, indirect and induced) value added per cubic meter € 200 (total 1760 mln eur). During the same period, the share of the entire **forest and wood industry sector in GDP has been on average 9.7%, the share in value added 11.1%[6].** Forests provide approximately 34,000 jobs in the forestry sector and many jobs also indirectly in tourism, sports, transport and other sectors. **In Estonia, there are a total of over 100,000 natural persons who are private forest owners.**
8. The renewable energy targets agreed at the EU and the national level will be achieved in Estonia in the most cost-efficient way, with a focus on high efficiency and free competition. The aim is to develop renewable energy by focusing on solutions that maximise the opportunities provided by Estonia's geographical and natural conditions (ie the share of wind energy is projected to increase substantially in the future energy mix). In the next 10-15 years biomass will still play an important role. The **use of biomass for energy will remain at the current levels for the next decade (ie around 12 TWh[7]).** In this way, bioenergy plays an important transitional role for flexible energy production through balancing the power system and allowing higher shares of variable renewable energy sources, such as solar and wind, in the electricity grid. In addition, it provides a sustainable and cost-effective way to decarbonise our district heating system.
9. Estonia is actively engaged in **planting trees in the forest. For example in 2018, a record was set for the last 10 years of tree planting in Estonia with a total of 33.3 million planted trees**: 21.3 million in state forests and 12 million in private forests. It is part of the forestry development plan and is in line with good forest management practices. In Estonia, forest management is regulated by the Forest Act.

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[3] Estonian Environment Agency, National Forrest Inventory and: https://www.keskkonnaagentuur.ee/sites/default/files/smi_2019_tabelid_graafikud_1.xlsx

[4] Estonian Environment Agency, Wood balance, Overview of wood use volumes in 2017: https://www.keskkonnaagentuur.ee/sites/default/files/elfinder/article_files/puidubilanss_2017_0.pdf

[5] Wood price statistics: https://www.erametsa.ee/uuringud-ja-statistika/hinnainfo/

[6] Woodworking Industry Development Cluster: http://empl.ee/wp-content/uploads/2019/10/EY_EMPL_metsa-ja-puidusektori-uuring_24.10.2019.pdf

[7] Estonia's 2030 National Energy and Climate Plan: https://ec.europa.eu/energy/sites/ener/files/documents/ee_final_necp_main_en.pdf