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Bioenergy in Finland

OVERVIEW

According to Statistics Finland (2020), the total consumption of energy in Finland amounted to 1.36 million terajoules in 2019. The consumption of electricity totalled 86.1 terawatt hours. The consumption of fossil fuels and peat decreased in total by 7%. The use of renewable energy grew by 1% remaining at a record high level just like in previous years. The share of wood fuels in Finland's total energy consumption was 28% in 2019. The use of wood fuels in energy production and manufacturing grew by 2% compared with 2018. By means of various policy measures, the Finnish Government plans to channel forest-based biomass to replace fossil fuels in heating, CHP production and the manufacturing of transport biofuels and other bioliquids (Statistics Finland, 2020).
With its liquid biofuels mandate, written into law in the spring 2019, Finland is one of the few countries with a fixed biofuels policy all the way to 2030. In parallel with increasing the amount of biofuels, energy efficiency and electrification in transport are promoted as well (IEA-AMF, 2019a). While the binding renewable energy target for the transport sector set by the EU is 10%, Finland has decided on a higher national target of 30% by 2030. A quota obligation to distribute biofuels applies to distributors of road transport fuels, ensuring that this target will be met (Business Finland, 2019).

BIOFUELS POLICY, REGULATIONS, MARKET DEVELOPMENT

In November 2016, the Finnish Government published the National Energy and Climate Strategy 2030. The 2019 Government Programme basically follows the 2016 energy and climate strategy, with a couple of additions related to low-emission transport. A new upper level target was set, according to which Finland targets to achieve carbon neutrality by 2035, and aims to be the world's first fossil-free welfare society (IEA-AMF, 2019b).
In February 2019, the Finnish parliament passed a legislation on gradually increasing the share of biofuels used in Finland's road traffic to 30% by the year 2029, including a target of 10% for advanced biofuels. The Government sustains the target of a 50% reduction of CO_2 for transport by 2030. A new upper level target for Finland to be CO_2 neutral by 2035 has been set (IEA-AMF, 2019a).
The contribution of biofuels to the total amount of fuels is 9.4% in terms of energy, varying from 6.2% in petrol (mostly ethanol, some ETBE and also bio-naphtha) to 59% in methane. In 2018, the biofuels mandate (for liquid fuels) called for a 15% share of biofuels. The actual amount was 364 ktoe or 9.3% of the liquid fuels, meaning that the greater part of the biofuels used was eligible for double counting (IEA-AMF, 2019a).

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ADVANCED BIOFUELS DEMONSTRATIVE AND R&D PROJECTS

The BioOneHundred pilot project, led by Helsinki Region Transport (HSL) and covering years 2016 to 2019, has ended. The project focused on high-concentration biofuels for carbon-neutral urban traffic (IEA-AMF, 2019a).
The MARANDA project (2017- 2021) aims at hydrogen-fueled fuel cell based hybrid powertrain system for marine applications and is still running (project website: https://projectsites.vtt.fi/sites/maranda/).
Business Finland is running a program called "Smart Energy Finland." The program brings together the services for technical development and exports and grants 100 million Euros to smart energy solution innovations from 2017 to 2021. The program also grants support for the international expansion of growth-oriented companies that possess growth potential and feature renewable energy and smart energy solutions in their product portfolio. The scope of the program is quite wide, transport-related issues are only a minor part of the program. However, one subtheme of the program is "sustainable bioenergy solutions," covering both biogas and advanced liquid biofuels (IEA-AMF, 2019a).
In 2015 opened the VTT Bioruukki pilot centre, the most significant bioeconomy research pilot centre in Finland. It offers companies a platform for new technology development, e.g. in the fields of biochemical and recycling, and realisation of bioeconomy concepts (VTT, 2021).

Operator: Fortum
Location: Joensuu
Process: Pyrolysis oil production facilities
TRL: 6-7
Start-up year: 2013
Installed capacity [t/y]: 50,000
Link: https://www.fortum.com/media/2013/11/fortums-bio-oil-plant-commissioned-joensuu-first-its-kind-world

Operator: Green Fuel Nordic Oy
Location: Lieksa
Process: Pyrolysis oil production facilities
TRL: 9
Start-up year: 2020
Installed capacity [t/y]: 24,000
Link: https://greenfuelnordic.fi/en/articles/lieksa-refinery-begins-bio-oil-deliveries-customers

Operator: St1
Location: Kajaani
Process: Ethanol production facilities
TRL: 6-7
Start-up year: 2017
Installed capacity [t/y]: 8,000
Link: https://www.st1.com/cellunolix-ethanol-plant-to-be-built-in-finland

Operator: Chemopolis Ltd
Location: Oulu
Process: Ethanol production facilities
TRL: 6-7
Start-up year: 2008
Installed capacity [t/y]: 5,000
Link: https://chempolis.com/

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LINKS

- Business Finland, 2019: Finland sets new law to increase biofuel use in road traffic. https://www.businessfinland.fi/en/whats-new/news/2019/finland-sets-new-law-to-increase-biofuel-use-in-road-traffic
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This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement No 825179