



Biofuels for the fast lane to a low-carbon future

The Finnish Government is showing great faith in advanced biofuels, aiming to increase the share of renewable fuels in road traffic to 40% by 2030.

The EU requires that the use of biofuels should result in reductions in greenhouse gas emissions compared to fossil fuels. The Renewable Energy Sources Directive calls for emission reductions of at least 35%. According to senior engineering advisor **Jukka Saarinen** of the Ministry of Employment and the Economy, this requirement will remain in force on the basis of the present directive until the end of 2016, after which it will be raised to 50% in January 2017.

The Indirect Land Use Change (ILUC) Directive meanwhile aims to limit the use of biofuels made from raw materials which can be used as food, or which compete with food crops for farmland. The directive also strives to create incentives for the development of next generation biofuels derived from wastes. Saarinen expects the ILUC Directive to bring forward a 60% emission reduction target for new biofuel production plants to make it apply to all facilities starting production after 5.10.2015 – though it may not result in any other changes to existing sustainability criteria.

The EU Commission has additionally announced that it may issue a new renewable energy package at the end of 2016, which would also address sustainability criteria for solid biomass and biofuels. This consequent changes to the present criteria would be unlikely to come into force before 2021, however.

Investment so far limited in Europe

– Investments in biofuel production across Europe have been fairly limited in recent years, says Saarinen.
– There may be many reasons for this, including economic factors as well as slower than expected technological developments. The EU's policy-making on biofuels has shown and still shows a considerable lack of awareness.

In its framework for 2030 the Commission has affirmed that it sees no need to set percentage targets for the next decade for the use of renewable energy in road traffic, or for greenhouse gas emission reductions for traffic fuels.

– The prospects in European markets are still very unclear, which of course makes businesses less willing to invest. Also here in Finland we cannot expect any significant boom in investments in major production facilities in the near future. During the present government's four years in office, however, new resources should become available to back investments in advanced biofuel production, adds Saarinen, who hopes that favourable conditions for investments will be created both within Finland and at EU level.



Finland particularly aims to increase the domestic production of biofuels that can be treated in line with the directive as “double counted biofuels”. The double counting of such biofuels will seemingly remain possible until 2020, when new policies defined in the ILUC Directive will come into force.

Double counted biofuels are fuels manufactured from certain raw materials, which are given a double weighting in calculations towards biofuel obligation targets, since the emissions from their life cycle are as much as 80–90% less than those of fossil fuels.

Double counted biofuels include fuels made from raw materials such as wastes, food waste or cellulose and lignocellulose from non-food sources. Finnish biofuels such as bioethanol derived from waste and biodiesel derived from logging residues duly fulfil the criteria for double counting.

Fuel distributors are obliged to mix biofuels into their fuel products in a proportion of at least 6% until 2016, after which the share will be raised gradually until 2020. It is expected that most of the targeted additional biofuel share will be met by increasingly using second generation biodiesel fuels derived from forest biomass. Cereals and other agricultural crops are not used as feedstock in any major bioethanol production plants in Finland.

BioPilot – focusing on bio-substitutes for diesel fuels

As part of the Finnish TransSmart research programme, the BioPilot project is focusing on alternatives to conventional diesel fuels. BioPilot is a networked project that links pilots realised by businesses with related projects conducted by the Technical Research Centre of Finland VTT. BioPilot's Finnish network is also closely linked to the International Energy Agency's work on advanced motor fuels.

The three main themes of the project's business segment (and the firms involved) are:

- 1) increasing the share of ethanol in heavy goods vehicles (NEOT/St1)*
- 2) renewable biodiesel fuel made from crude tall oil derived from pine trees (UPM)*
- 3) increasing the share of biomethane in heavy goods vehicles, and adding value to renewable diesel fuels usable in dual-fuel solutions (consortium project led by the operators Stara and Posti).*

VTT are also studying related issues concerning fuel combustion in motors.

Biodiesel from the forest tested in Finnish buses

The Finnish forest industry firm UPM has initiated trials using wood-based biodiesel fuel in collaboration with Helsinki Region Transport and VTT. Other firms involved in the trials include the energy company St1, Volvo and Transdev Finland. Road tests commenced in October 2015, and will run for at least a year.

– Our renewable diesel is suitable for all kinds of diesel motors, and it demonstrably reduces life cycle carbon dioxide emissions by 80% compared to fossil fuels,” says UPM Biofuels sales and marketing manager **Sari Mannonen**.

UPM's BioVerno diesel has been tried and tested in many motors and vehicles in research labs and out on the road. It has been shown to work as well as the best conventional diesel grades, while also significantly reducing urban air pollution.

Trials on buses running between Helsinki and Kerava are focusing on the new fuel's impacts on bus motors, and on emission and fuel consumption rates compared to fossil diesel.

BioVerno has been on sale since spring 2015 at St1 service stations as part of the distributor's Diesel Plus fuel mix. It can be added into a fuel mix or used undiluted. BioVerno is made from crude tall oil, a by-product of pulp-making processes, so its production chain does not include any raw materials that can be used as food.

The TransSmart research programme is publicised by Motiva Oy – Text and graphic design: by Motiva Oy – Photo: Motiva Oy – Translation: Frans Weaver

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