Material efficiency

Efficient feedstock use

Conventional oil refining is highly efficient in terms of material usage, as virtually all the feedstock used can be refined into products or feedstocks for other industrial uses. Oil refining also generates very little waste, as any product not meeting the quality requirements can be returned to the process and re-refined.

Neste Oil strives to make maximum use of the inputs employed to produce renewable fuels. The renewable naphtha produced as a by-product during NExBTL renewable diesel production, for example, is sold to customers in the chemical industry. In addition to renewable naphtha, Neste Oil is also planning to commercialize the renewable propane and renewable isoalkane produced as a side-product during the NExBTL process.

Read more about Neste Oil's renewable raw material use.

52% of total raw material use comprised waste and residues

Premium-quality products produced from other's waste

Unlike many other companies in the energy field, Neste Oil does not only use waste to generate energy, but also uses waste and residues to produce premium-quality, low-emission traffic fuels with the help of its NExBTL technology. Neste Oil used 1,2 million tons (742,000 tons) of waste and residues for refining purposes in 2013, equivalent to 52.6% (35.1%) of its total usage of renewable inputs.

The waste and residues-based inputs used in 2013 comprised waste animal and fish fat, technical corn oil, tall oil pitch, and palm fatty acid distillate (PFAD), a by-product of palm oil production. Neste Oil increased its use of waste animal fat and PFAD in particular, and produced enough renewable diesel from waste and residues in 2013 to power around 1.3 million cars for a year.

Industrial symbiosis helps reduce Neste Oil's impact on the environment

Neste Oil aims to use natural resources effectively and efficiently at all its refineries. The fact that its refineries are located in industrial areas offers numerous opportunities for leveraging synergies in this area with neighboring plants. The Porvoo refinery, for example, generates around 10,000 tons of used wash liquor annually, which can be used as an input by pulp mills. The sulfur recovered from crude oil is processed into elemental sulfur, which can be used as a product in its own right. The Porvoo refinery also generates the majority of the energy used by Neste Oil and the other companies in the Kilpilahti industrial area.

Neste Oil's refineries in Singapore and Rotterdam are able to make use of sidestreams and process waste from nearby companies in their own production processes. They also source the gases, electricity, water, and steam they need from nearby chemical and energy generation plants.

Read more about how CO_2 is recovered at the Porvoo refinery.

Material efficiency in production, case Porvoo refinery

Some of the carbon dioxide from production is recovered for re-use

Local gas company

The carbon dioxide is sold to a gas company operating in the same industrial area, and used by the beverage industry, for example.

The power plant at the Porvoo refinery generates the majority of the energy used by the companies operating in the same industrial area.

Power plant at the Porvoo refinery

Hydrogen plant at the refinery

Sulfur from crude oil is recovered, processed, and sold as a separate product.

Sulfur recovery unit at the refinery

Refining

Cleaner traffic fuels

Waste and residues from other operators

1.2 million tons in 2013

E.g. animal and fish fats, technical corn oil, PFAD (palm fatty acid distillate)

Washing lye from production is recovered.

Approximately 10,000 tons/year

Pulp industry

Recovered washing lye is sold to the pulp industry