

Voluntary Report – Voluntary - Public Distribution

Date: November 06, 2024

Report Number: FI2024-0002

Report Name: United States Tall Oil Exports to the Nordics Surge

Country: Finland

Post: The Hague

Report Category: Biofuels, Wood Products

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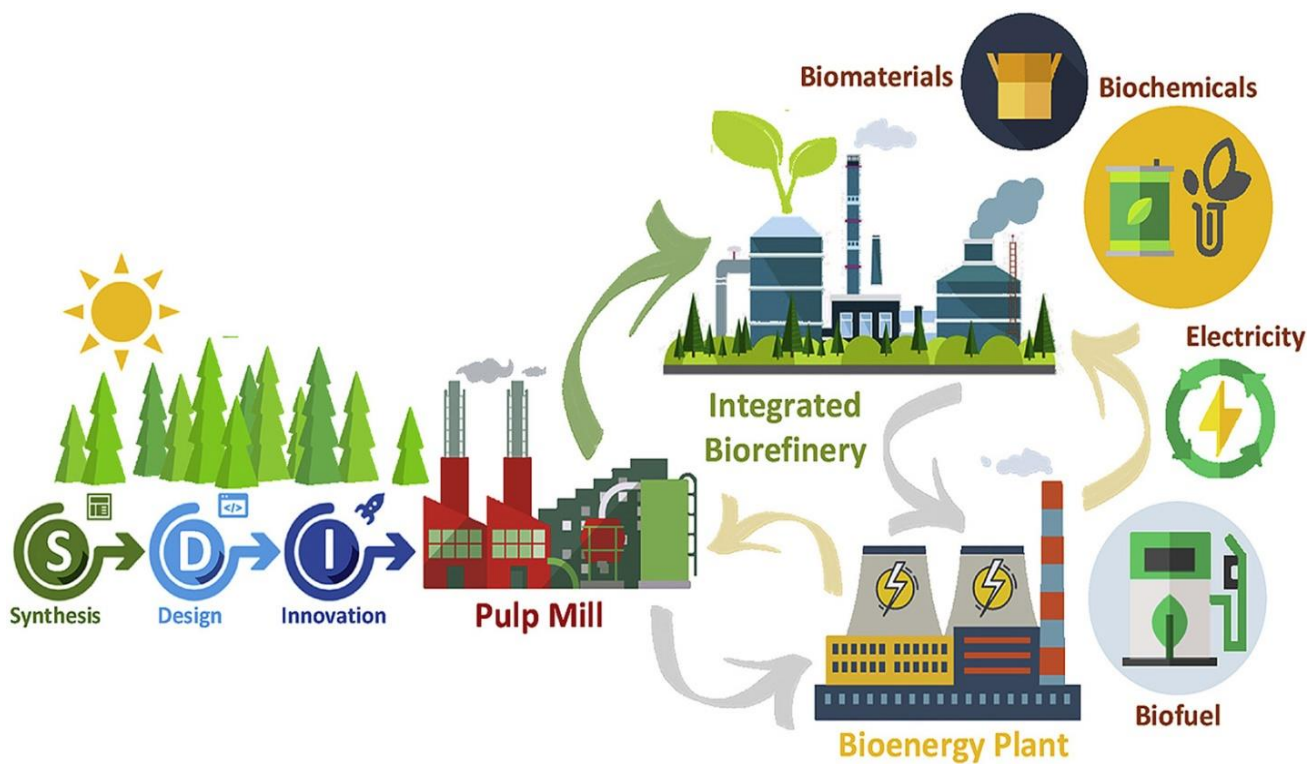
Approved By: Laura Geller

Report Highlights:

In 2023, the value of U.S. tall oil exports to Finland and Sweden rose to nearly a quarter of a billion dollars. This is mainly due to a surge of the price of tall oil as the demand as feedstock for the production of advanced biofuels is increasing while the availability is limited. Because Finland and Sweden will further expand their biofuel production capacity in the next five years, their import demand for tall oil is forecast to grow accordingly.

Introduction – Tall Oil

Tall oil is produced from black liquor generated by the pulping of wood. A pulp mill can use the crude tall oil as process fuel or sell it to biorefineries or biofuel plants to process it into biobased products (such as rosin, turpentine, adhesives, paint, ink, wellness products, and biofuels). The pulp mill plays a central role in the value chain of the bioeconomy (see picture below) and is typically located near the source of the woody biomass, such as the forested areas in the European Nordics (Norway, Sweden, and Finland) or in the Southeast of the United States. But the processes of the pulp mill, biorefinery, and bioenergy plant could also be integrated at one location, such as at a seaport. For more information about the infrastructure and location of a biorefinery see the FAS GAIN - [Netherlands: Case Studies for a Biorefinery](#), published May 14, 2018.



Source: [Journal of Cleaner Production](#)

Global Production and Trade of Tall Oil

Global tall oil production is estimated at about 2.0 million metric tons (MMT) per year, and predominantly produced in North America (920,000 MT in 2023), Nordics (710,000 MT), and Russia (285,000 MT)¹. The total potential tall oil supply is estimated at 2.6 MMT per year². The current annual

¹ [The crude tall oil value chain: Global availability and the influence of regional energy policies](#)

² [Crude tall oil low ILUC risk assessment](#)

use to produce biochemicals is estimated at 1.0 MMT, the use for bioenergy at 700,000 MT, and for transport biofuels at about 380,000 MT¹.

By a large margin, the United States is the leading exporter of tall oil followed by Sweden, Finland, Poland, Germany, and Brazil (see table below). The surge of U.S. exports in 2023 is due to an increase of the unit value of tall oil. In volume, U.S. exports declined from 261,000 MT in 2022 to 230,000 MT in 2023.

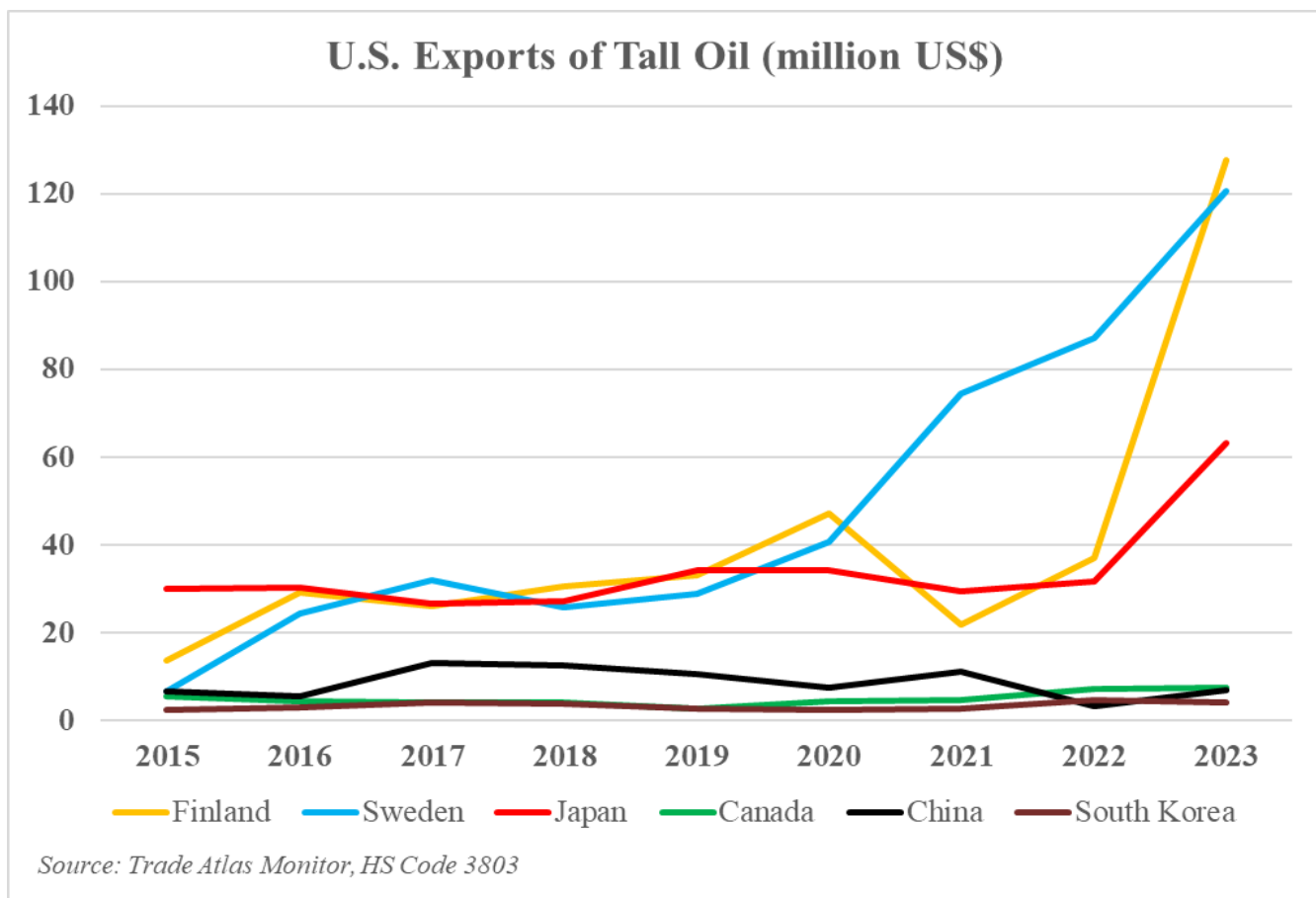
Exports of Tall Oil (million US\$)									
	2015	2016	2017	2018	2019	2020	2021	2022	2023
United States	101	120	132	143	152	176	184	212	344
Sweden	12	24	35	23	39	36	45	57	42
Finland	19	11	15	20	17	19	59	44	34
Poland	5	4	4	6	6	6	10	19	26
Germany	11	13	14	14	10	6	6	11	23
Brazil	4	7	1	0	5	5	6	12	19
Canada	5	5	3	2	4	4	4	5	7

Source: Trade Atlas Monitor, HS Code 3803 (Tall Oil, Whether Or Not Refined).

In value, U.S. tall oil exports rose most significantly to Finland and Sweden in 2023 (see graph below). In volume, U.S. exports rose to Finland (from 58,000 MT in 2022 to 81,000 MT in 2023) but declined to Sweden (from 106,000 MT to 96,000 MT). In 2023, Finland and Sweden combined represented a tall oil market of 177,000 MT with a value of \$248 million, which corresponds to unit value of about \$1,400 per MT.

From 2015 to 2021, U.S. tall oil export prices fluctuated between \$450 and \$650 per MT and rose to nearly \$1,500 in 2023. Currently, prices are fluctuating around \$1,150 per MT. These price levels for tall oil are roughly comparable to the prices quoted for oilseed oils such as sunflower, rapeseed, and soybean oil, and slightly higher than quoted for palm oil and used cooking oil (UCO).

The price surge in 2022 and 2023 is partly caused by Russia's invasion of Ukraine, by which significantly affected imports of forest products from Russia (for more information see the [EU Wood Pellets Annual](#), published on July 5, 2024). Other factors are the price surge of other vegetable oils, such as palm oil, the limited production of tall oil, and increased demand from the biofuels sector, in particular for producing advanced biofuels.



Tall Oil and the Second EU Renewable Energy Directive (REDII)

The REDII defined advanced biofuels as biofuels made from feedstock listed in Part A and B of Annex IX of the directive. Biofuels from feedstocks listed in Part A must be supplied at a minimum of 1 percent in 2025 and 5.5 percent in 2030³. Biofuels produced from feedstock listed in Part B will be capped at 1.7 percent in 2030⁴. Tall oil and tall oil pitch (a fraction of tall oil) are both listed in Part A of Annex IX⁵. In May 2024, the European Commission adopted [Delegated Directive \(EU\) 2024/1405](#) which adds new feedstocks in Annex IX of the REDII. For more information see the [EU Biofuels Annual 2024](#), published on August 13, 2024.

Biorefinery and Biofuels Sector in Finland and Sweden

Besides being major producers of crude tall oil (about 440,000 MT per year), Finland and Sweden are also top importers because both countries are specialized in the further processing and valorization of

³ A share of at least one percentage point must be from renewable fuels of non-biological origin in 2030.

⁴ Except in Cyprus and Malta.

⁵ (h) tall oil pitch, and (o) Biomass fraction of wastes and residues from forestry and forest-based industries, namely, bark, branches, pre-commercial thinnings, leaves, needles, treetops, saw dust, cutter shavings, black liquor, brown liquor, fiber sludge, lignin and tall oil;"

crude tall oil in a variety of biobased products and biofuels. The main processors of tall oil and biofuels plants in Finland and Sweden are listed below:

Biorefineries in Finland

[Fintoil](#) (in Hamina) is specialized in distilling crude tall oil into fractions (fatty acids, sterol, turpentine) which can be used to produce biobased end-products. Reportedly also feedstock for roughly 100 million liters of renewable diesel is produced. The capacity of the [plant](#), which became operational in the fall of 2022, is 200,000 MT of crude tall oil.

[Forchem](#) (Rauma) refines about 150,000 MT of crude tall oil per year into resin and fatty acids. The plant has been operational since about twenty years.

Two other biorefineries (plan to) produce biobased products directly from woody biomass:

[Green Fuel Nordic Oy](#) (Lieksa) partnered with a Dutch company, BTG, to produce 25 million liters of pyrolysis oil from forest biomass.

[Nordfuel](#) (Haapavesi) is planning the construction of a biorefinery which will convert sawdust and forest thinnings into ethanol (annually 90 million liters), biogas, lignin (95,000 MT), and lignin cake (45,000 MT). The biomass use will be about 340,000 MT annually.

Biofuel plants in Finland

[Neste](#) (Porvoo) operates one plant with two lines each producing roughly 200,000 MT of biofuels and intermediate feedstocks per year of which about 215 million liters of hydrogenation derived renewable diesel (HDRD).

[UPM](#) (Lappeenranta) operates a HDRD plant with a capacity of roughly 115 million liters of advanced biofuels per year, using tall oil as feedstock.

Biorefineries in Sweden

[Kraton](#) (plant in Söderhamn, head office in Houston Texas) processes tall oil in formerly the world's largest crude tall oil distillation plant. In 2022, this ranking was taken over by Fintoil with the plant in Hamina (see above). The factory of Kraton has a capacity of about 170,000 MT of crude tall oil per year.

[Sunpine](#) (Piteå) increased its annual capacity of crude tall oil processing from about 100,000 MT to 150,000 MT in 2021. One of the materials produced by the plant is biocrude oil as feedstock for the production of HDRD.

Biofuel plants in Sweden

[St1](#) (Gothenburg) opened a plant to produce up to 250 million liters of HDRD and sustainable aviation fuel (SAF) in April 2024. The feedstocks will likely be used cooking oil (UCO), animal

fats, and tall oil fatty acids, the latter from [SCA's](#) paper and pulp mills. St1 is also investigating the construction of another plant with a capacity of 500 million liters of HDRD to begin operations in roughly five years.

[Preem](#) (Gothenburg) produces nearly 160 million liters of HDRD per year. The company recently expanded its production capacity to 220 million liters. Preem sources a variety of raw materials, including tall oil derivatives from SunPine. The company is reportedly planning to further expand its HDRD and SAF production to five million liters in 2035.

Given the increasing demand for feedstocks for advanced biofuels in the EU, the import demand for tall oil is forecast to increase through 2030. While in Finland and Sweden most of the crude tall oil is already utilized for the production of biobased products and transport biofuels, in the United States a portion of the black liquor is not distilled into tall oil and used as process fuel by pulp mills. The current U.S. production of tall oil is estimated at 0.88 MMT, with potential production at 1.34 MMT¹.

For more information about biofuels see below the GAIN reports published by FAS The Hague:

[EU Biofuels Annual 2024](#), published on August 13, 2024

[EU Wood Pellets Annual](#), published on July 5, 2024

[Markets for Wood Chips in Northwestern Europe](#), published on April 23, 2024

[Sustainable Marine and Aviation Fuels in Northern Europe](#), published on December 13, 2021

[Case Studies for a Biorefinery](#), published May 14, 2018.

Attachments:

No Attachments.