Leveraging Renewable Hydrogen to Combat Climate Change

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NESTE

Agenda

1. Introduction to Neste
2. Neste and renewable hydrogen
3. Moving forward with the renewable hydrogen investments

Our purpose is to create a healthier planet for our children

Neste in a nutshell

Fueling the future - Neste Porvoo to become the most sustainable refinery in Europe by 2030

Leading renewable and circular solutions refining hub

Gradual transformation of crude oil refinery in Porvoo, Finland. Total investment estimate for the transformation ~2.5 billion euros.

~ 3 Mt/a

Renewable and circular capacity potential

mid-2030s

Targeted completion

by 2035

Carbon neutrality and climate commitments reached

Release 20 December 2023: Neste's crude oil refinery in Finland to be gradually transformed into a renewables and circular solutions refining hub (link)

Renewable hydrogen is an important development area for Neste

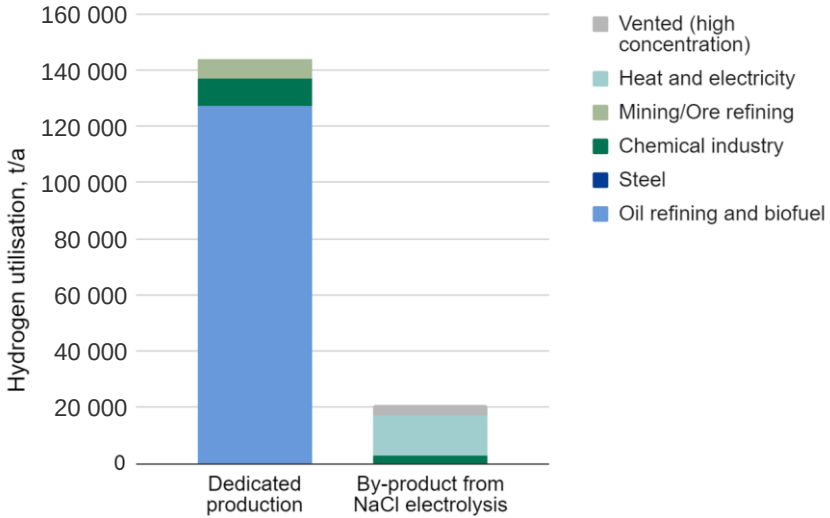
Focus on **renewable hydrogen** is an essential part of Neste's strategy.

- Replaces fossil hydrogen in Neste refinery processes
- Contributes to reaching Neste's climate commitments
- Contributes to making Porvoo refinery the most sustainable refinery in Europe by 2030
- Creates a platform for e-fuel production
- Increases national energy self-sufficiency and supply security

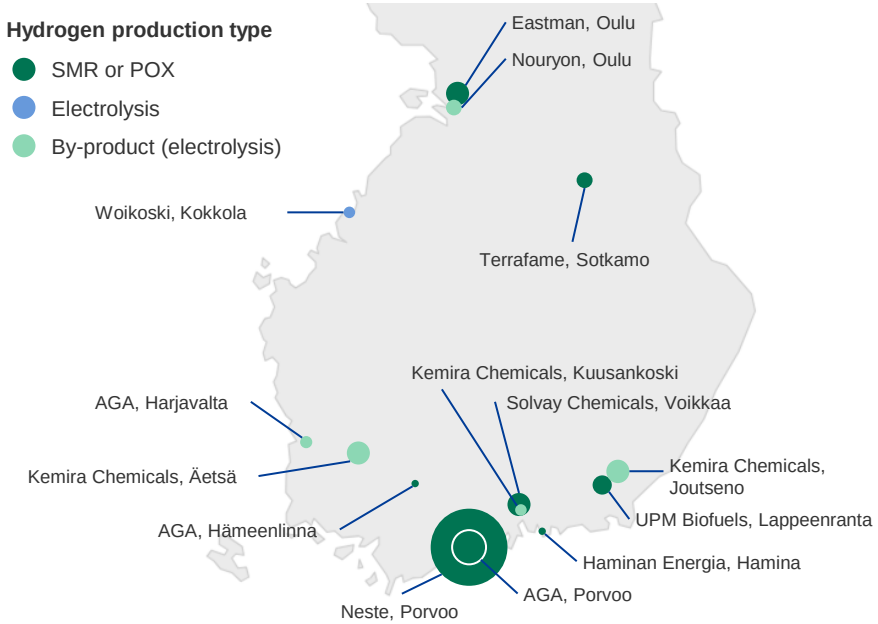
Neste Porvoo refinery is Finland's largest hydrogen consumer. Transformation to renewable hydrogen is an important part of the hydrogen economy development in Finland.

Current hydrogen production in Finland

Including both dedicated production and by-product hydrogen. Hydrogen generated and used in refinery operations is not included.



Location of hydrogen production and use



Source: Business Finland National Hydrogen Roadmap 2020

120 MW electrolyzer for green hydrogen production at Neste Porvoo refinery

- Neste's objective is to reach Final Investment Decision readiness during 2024. Production could then start in 2026
- The aim is to utilize the heat generated in the production process for district heating purposes

Green hydrogen

Production of green hydrogen by electrolysis, execution in phases

First phase, 120 MW, in basic engineering phase (ca. 2t/h of green hydrogen)

Green hydrogen to refining

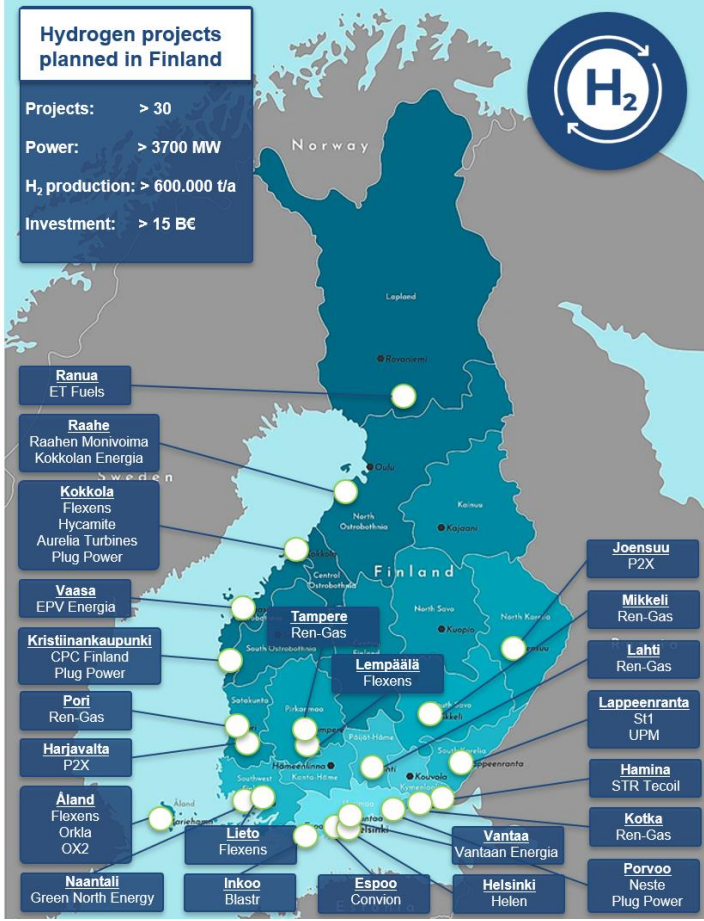
Utilization of the heat generated in the production

Funding:

- IPCEI grant of 27.7 MEUR to hydrogen projects in Porvoo by Business Finland
- Energy investment aid of 1.96 MEUR for heat recovery from hydrogen production by Ministry of Economic Affairs and Employment in Finland

Strengths of the Hydrogen Economy in Finland

- A robust and clean electricity system as a basis for clean hydrogen expansion
- Opportunities for sectoral integration (district heating, biogenic CO_2)
- High-tech, stable society with unique competencies as a basis for ecosystems
- Vast resources of clean water

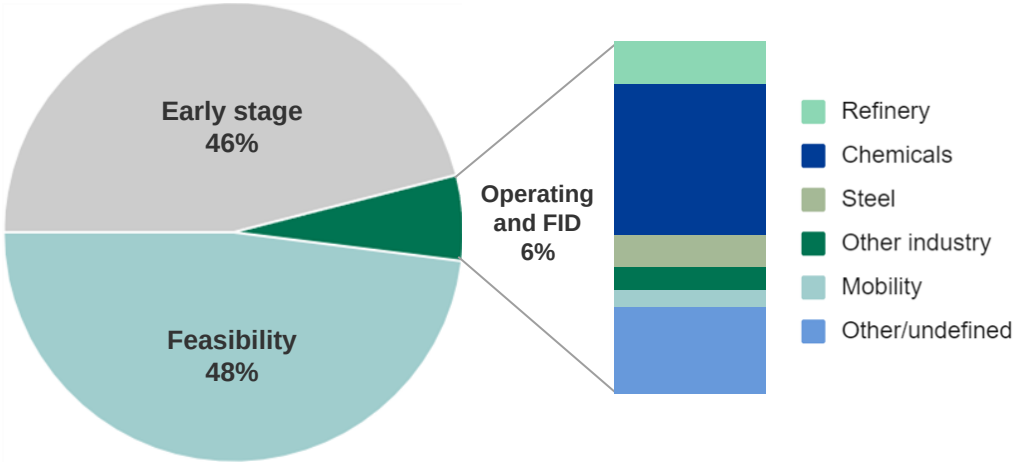


Source: Hydrogen Cluster Finland

38 Mtpa of low-emission hydrogen production has been announced globally but only ~ 5% have reached FID

Projects that are currently under construction or have taken a final investment decision (FID) account for only ~5% of the announced projects in terms of production.

Of these projects, almost 50% are linked to existing hydrogen uses in refineries and the chemical industry.



Source: IEA Global Hydrogen Review 2023

Leading the way in green transition: Key enablers for renewable hydrogen investments

Renewable electricity ramp-up

Massive investments to renewable power production and transmission capacity

Infrastructure build-up

Power transmission and hydrogen storage & distribution infrastructure development

Electrolysis

Electrolyzer manufacturing capacity is not meeting the demand - accelerated capacity ramp-up needed

New partnerships

Value chain development and cross sectoral integration between industry and utility sector

Regulation

Clear, enabling regulation to drive demand and investments

Funding

Financial support to kick start the hydrogen economy


Thank you.