




# Hydrogen Cluster Finland

## Finnish Hydrogen Value Network



An aerial photograph of a wind farm in a forested landscape. Two large wind turbines are visible in the distance, and a third, larger one is in the foreground on the right. The landscape is covered in dense green forest, and the sky is blue with some clouds.

# Hydrogen Cluster Finland

Established in early 2021  
by companies with support  
of industry associations

Over 70 member companies  
across hydrogen value chain  
and six industry associations

By 2030, Hydrogen Cluster  
Finland companies deliver solutions  
for building a carbon neutral  
society globally

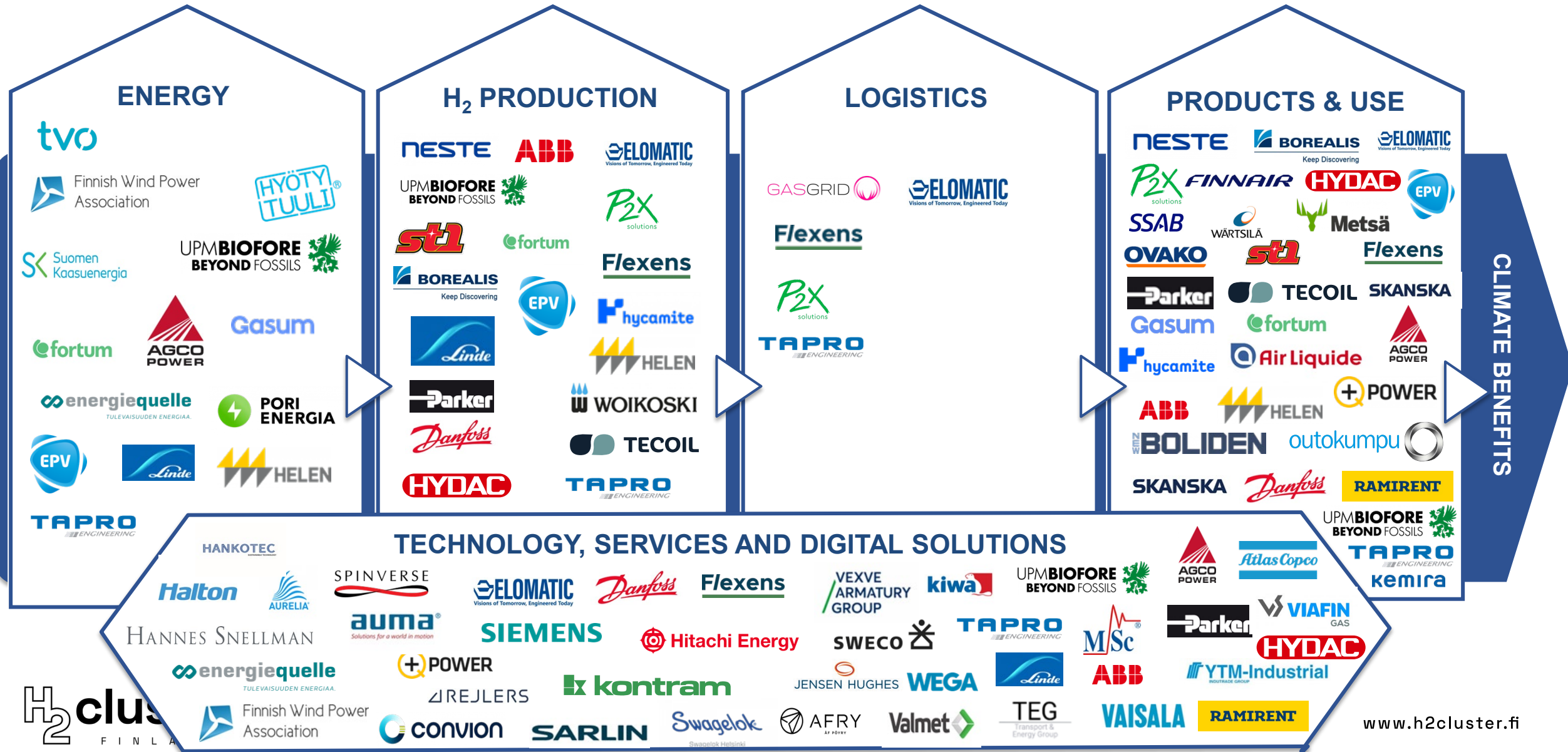


# Meet our 70+ active members throughout the value-chain



# Finnish hydrogen value network

New technologies, business opportunities and climate benefits throughout the value network



# Operating Model and Working Groups 2023

Steering Group – Chair Simo Säynevirta, ABB

## Cluster meetings – Over 70 companies and 5 industry associations

Common interests, focus areas, working groups  
Stakeholder group collaboration meetings



Coordination: Pia Salokoski, CLIC Innovation

# Finnish Strengths in Hydrogen economy



A robust and **clean electricity system** as a basis for clean hydrogen expansion



**High-tech**, stable society with unique competencies basis for **ecosystems**



Extensive **sector coupling opportunities** to integrate hydrogen across industries and energy sectors for **maximum value add**

# Finland – European Leader in Clean Hydrogen Economy 2030

**The hydrogen economy ensures a carbon-neutral future and energy independence**

**Industrial production is currently being redistributed**

- In the future, energy-intensive industry will be most prominent in countries that can offer clean electricity and hydrogen at the most competitive price.

**Finland offers clean electricity at the most competitive price in Europe**

- Finland is competitive because of the enormous potential for building new wind farms and a strong electricity grid.

**Hydrogen-economy scale up accelerating in Finland**

- Thanks to extensive technical expertise, Finland already has great potential for the production of hydrogen, as well as for the related technologies and solutions.

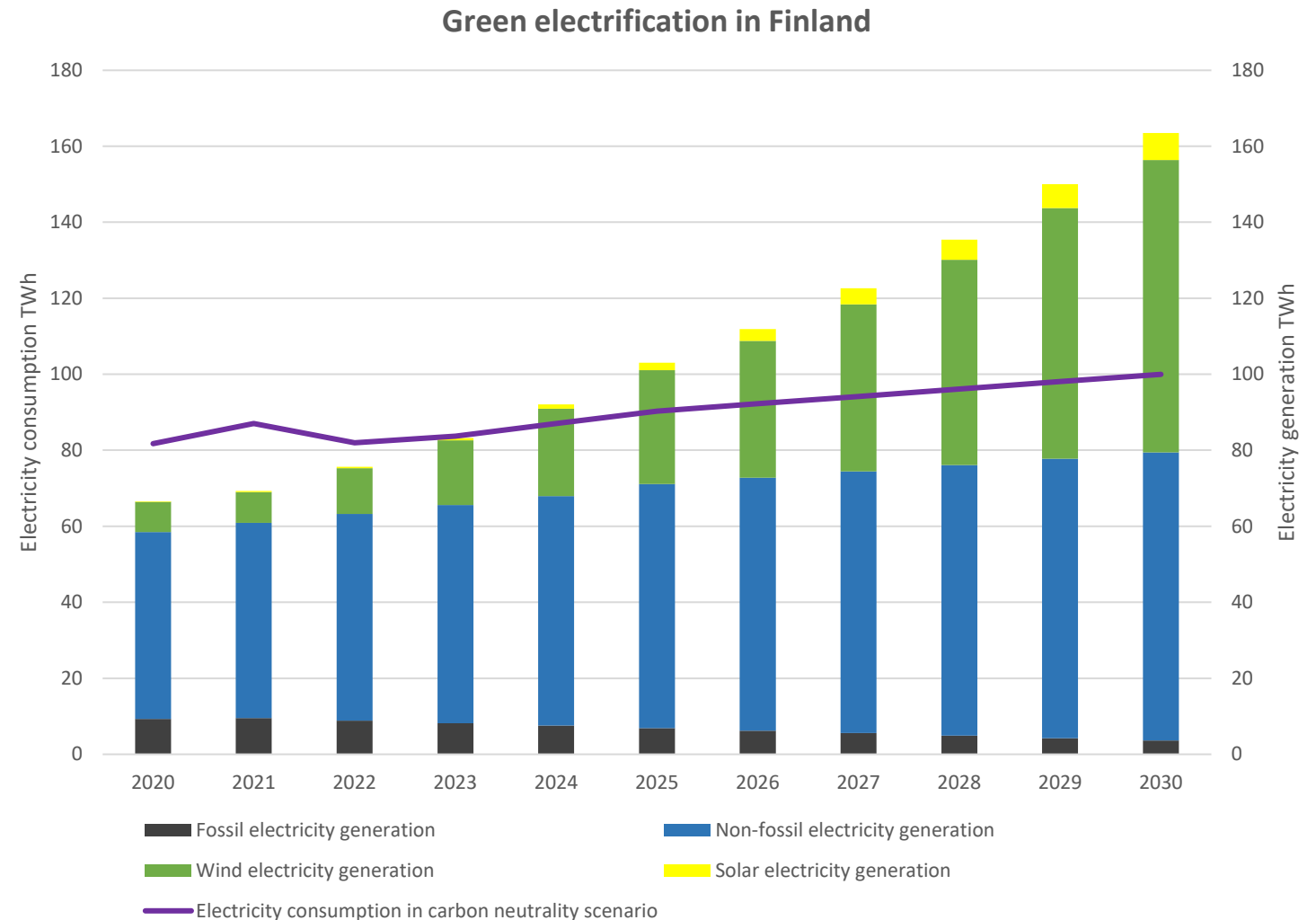
**The hydrogen economy is an extremely large, new industrial sector**

- It enables energy independence, increases employment and guarantees a carbon-neutral future both in Finland and elsewhere in Europe.
- Finland has the potential to produce up to 45% of all the clean hydrogen needed for the REPowerEU plan.



# The production potential of clean hydrogen in Finland is significant – and competitive

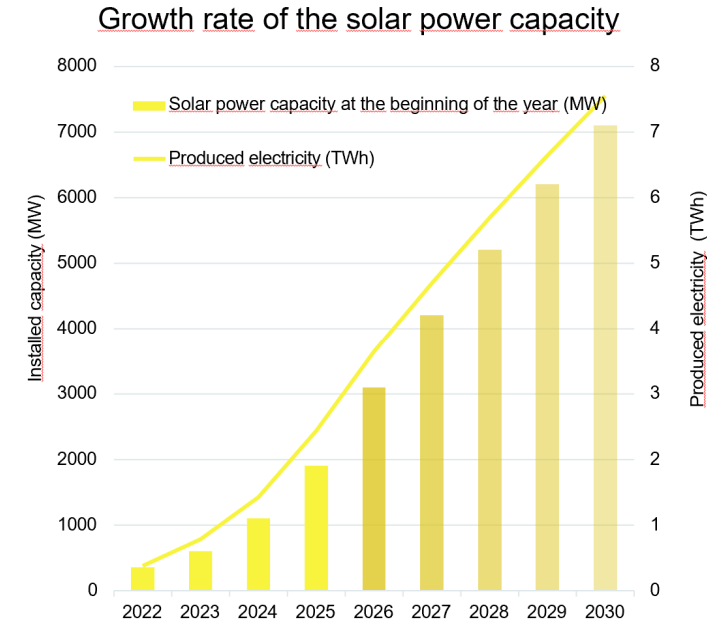
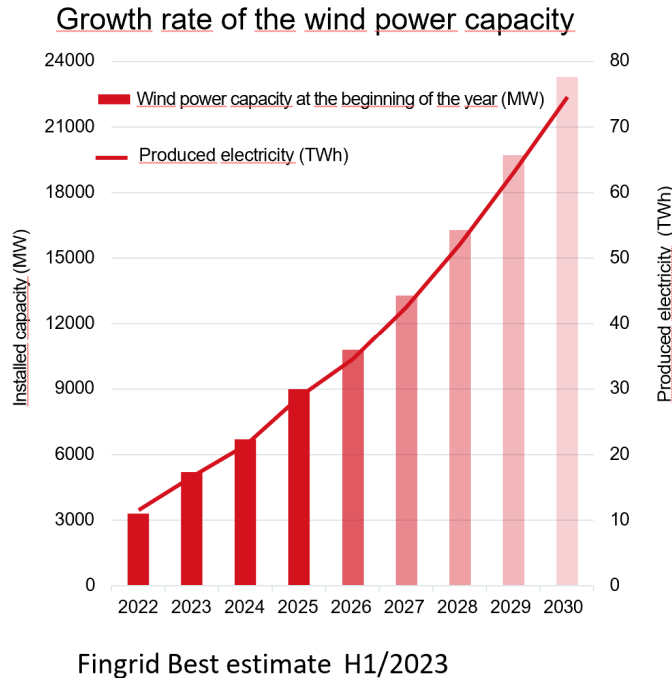
- Climate-neutral Finland by 2035. The world's first fossil-free welfare society
  - Electricity production will be carbon neutral already 2030
  - Electrification with high energy efficiency
- In 2020, 86% of electricity produced in Finland was produced carbon-dioxide neutrally and 52% with renewable energy sources
- 04/2023 Finland produced the cheapest electricity in Europe - Finland is the most attractive place to invest for the energy intensive industry





# The production potential of clean hydrogen in Finland is significant – and competitive

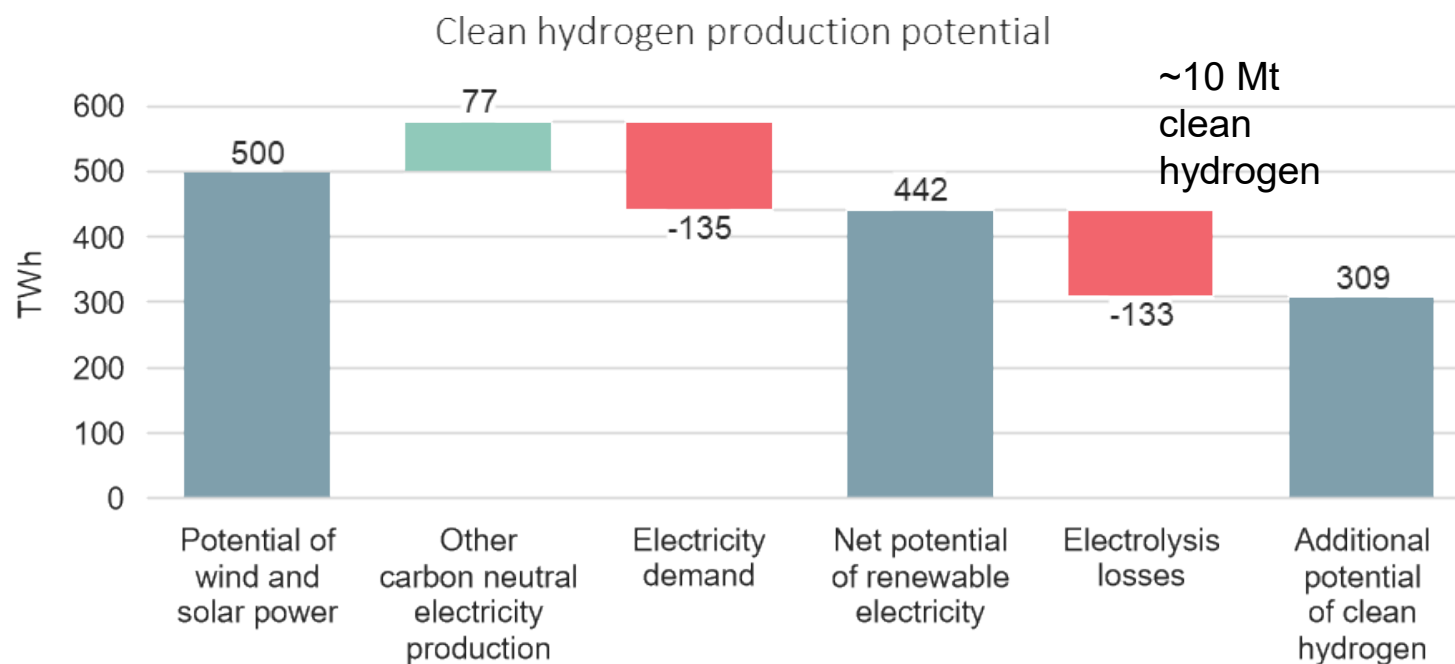
- In 2021, 87% of electricity produced in Finland was produced carbon-dioxide neutrally and 54% with renewable energy sources
- Wind power boom: wind power capacity will reach approximately **23,000 MW** by the end of the decade
  - Finland combines favourable wind conditions with the possibility of constructing cost-effective onshore wind power based on tall hub height
  - The cost level of Finnish onshore wind power is significantly lower than that of European offshore wind power
- Rapid growth with solar power complements the mix
  - Current projection **7,000 MW** solar generation capacity by 2030



Projected development of renewable power capacity in the 2020s.  
Source: Fingrid Oyj

# Finland has significant potential relative to Europe's estimated demand for hydrogen

- Fingrid has received over **230,000 MW** of enquiries for connecting to the main grid, most of which concern onshore wind power
- If 65% of the projects (**150,000 MW**) were commissioned, they would generate about 500 TWh of electricity per year.
- Of this, almost **450 TWh** would be available for new industries, equivalent to more than 300 TWh of clean hydrogen production





# Finnish Hydrogen projects

The selected Finnish clean hydrogen projects cover the whole value chain from feedstock to end products. Project characteristics are presented below at an aggregate level.

**Number of Projects: 24**

**Σ CO<sub>2</sub> –emission reduction: 3,5 Mt**

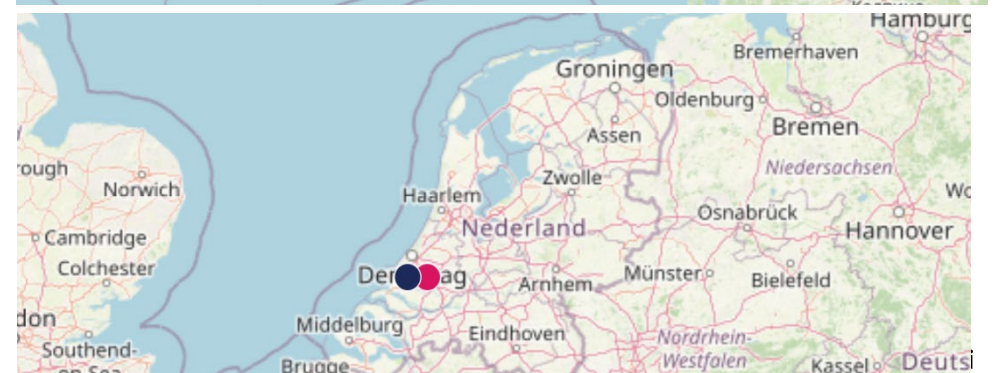
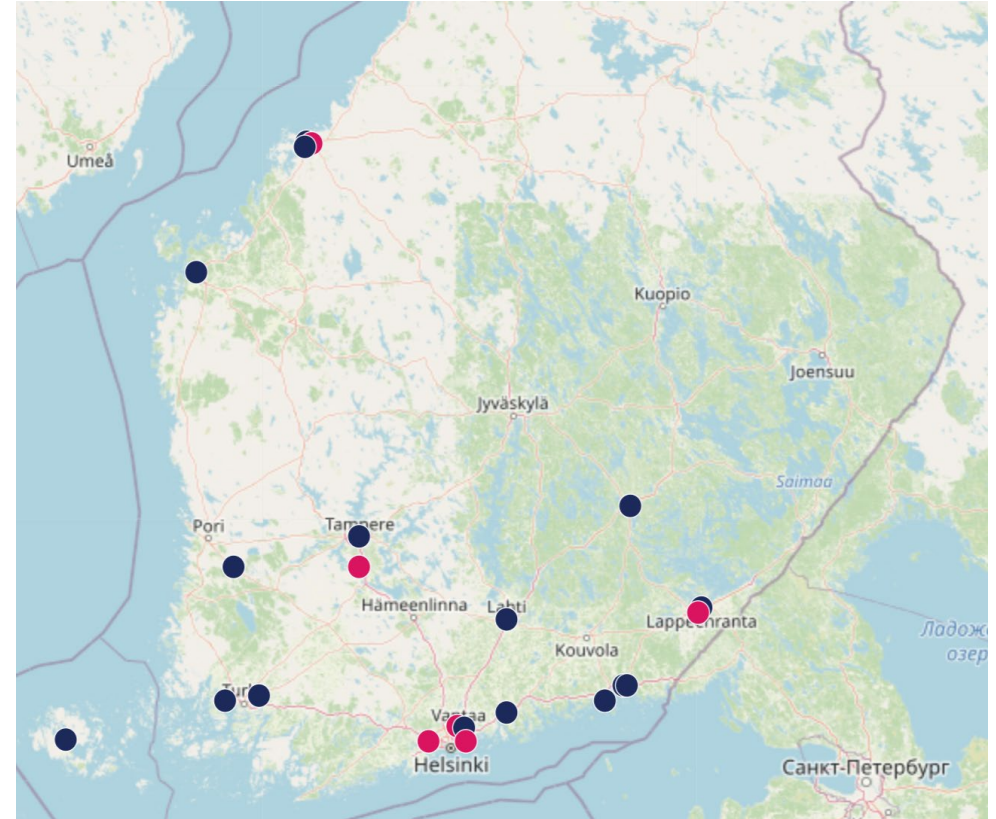
**Start of operation: 2024-2026**

**Σ Investments: 1-2 B€**

**Total electrolyser capacity (MW): 500-1500**

Companies:

Aurelia Turbines, Convion, EPV Energy, Flexens, Green NorthH<sub>2</sub> Energy, Helen, Hycamite, Neste, Nordic Ren-Gas, P2X Solutions, St1, STR Tecoil, Vantaa Energy, UPM-Kymmene







**All members and more information**

**[www.h2cluster.fi](http://www.h2cluster.fi)**