The Finnish Hydrogen Value Network

New technology, business potential and climate impact in every segment

Sakari Kallo, Hydrogen Cluster Finland

Finnish Hydrogen Cluster

Established in early 2021 by companies with support of Ministry of Economic Affairs and Employment of Finland and industry associations

48 member companies across all steps of hydrogen value chain and six industry associations

Operating Model and Working Groups 2021

Steering Group– Chair Outi Ervasti, Neste

Cluster meetings – 48 companies and 6 industry associations

Common interests, focus areas, working groups, financials
Stakeholder group – and collaboration meetings

WG1: How will Finland differentiate – Chair Simo Säynevirta, ABB

- System level energy efficiency optimisation
- Competitive solutions and capabilities
- Value networks, collaborations, IPCEI

WG2: Innovation and investment projects – Chair Sakari Kallo, SSAB

- Summary of Hydrogen projects in Finland
- Linkage to EU Hydrogen IPCEI projects
- R&D and investment financing
- Recovery Package

WG3: Networking – Chair Matti Malkamäki, Aurelia Turbines

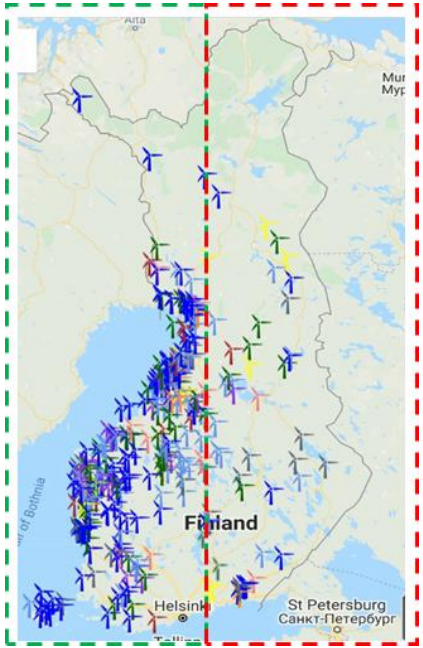
- Clean Hydrogen Roundtables
- Hydrogen IPCEI preparations at EU-level
- BothH_2nia - project
- EU-affairs and information sharing

WG4: Operating environment and regulation – Chair Olli Sipilä, Gasgrid

- Combined view from the cluster company
- Evaluation on impacts of the coming regulation and taxation
- Cluster statements

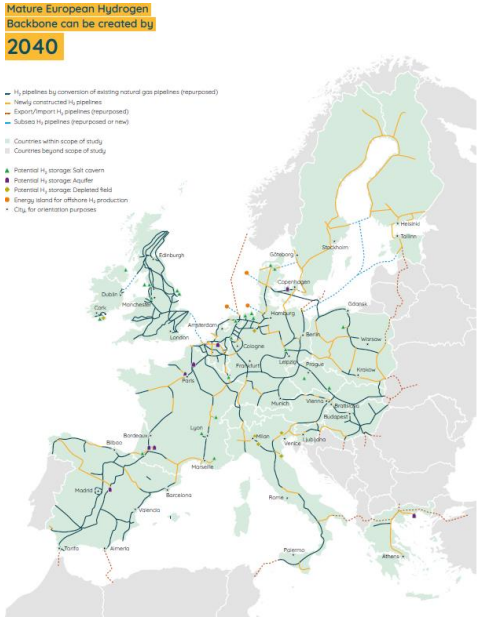
Secretariat

Wind power and hydrogen as a basis for a major new export industry for Nordics



Source: Suomen tuulivoimaprojektit, Ethawind.com

- Excess clean power, mostly onshore wind
  - Case Finland: > 200 TWh
- Compatible industries for e.g. H_2 derivates
- Land area, water, heat demand…
- Relatively close to future demand centers in Europe
- Advanced energy markets
- High personal, governmental and company ambitions to tackle climate change
- Good investment environment for capex intensive industries



Projects towards a competitive value chain create business benefits for the Finnish export industries

H2cluster FINLAND

Value chain integration a requisite of a self-reinforcing ecosystem

- Comprehensive portfolio of 18 projects in various value chain segments
- Commercialization and new business development important objectives
- Renewable energy, efficiency and infrastructure key bottle necks
- Circularity of the ecosystem a design spec from the get-go

Scaling, efficiency and utilization rates key foci for research and development

- Many projects still in pre-pilot/demonstration phase
- RDI required: Acceleration of development via RDI collaboration with ROs
- Public research, development and investment support needed

Safety, competences and digitalization important enablers of integration across the value chain

- Cross-cutting safety standards and skills drive value chain integration between segments
- Digital solutions help model material and energy flows, and improve availability

Predictability and reliability of access to hydrogen an important ecosystem feature

- Sufficient local and national infrastructures important backbones od the ecosystem
- Improvements to permit processes and legislation necessary for greater flexibility

Overview

- The initiatives fully support the Finnish national carbon neutrality target 2035 and the EU commission climate neutrality target 2050
- Pre-study, engineering, demonstration, pilot, scaling and final commissioning of the initiatives are planned for 2021-2026, and the larger industrial conversions for 2030-2035
- Estimated CO_2 emission reduction potential is 4-6 million t CO_2/a and estimated investment expenditure 1000+ MEUR
- Remarcable employment impact foreseen for RDI, construction, implementation and new business throughout the entire value chain

Current HCF priorities

- Contribution to Finland's Climate and Energy Strategy which will include also a H2 strategy. White Paper.
- Contribution to the finalization of the Fit for 55 –package. Position paper.
- Updating the information of the industrial hydrogen projects in Finland.
- A survey of the skills and R&I needs in the member companies and another one the education and training provision and R&I priorities relevant for H2 economy by universities and RIs in Finland underway.
- HCF member companies developing joint national, cross-border and European initiatives for R&I and participating in preparation of Hydrogen IPCEI projects prepration.

Target state for Finnish Hydrogen Economy in 2030

Finnish hydrogen industry building carbon neutral society globally

- Clean electricity is abundantly available, with the most competitive price in Europe
- Systemic value add maximized through extensive sector integration
- Finnish hydrogen know-how and solutions on the world leading level
- Finland attracting most investments (per GDP) in hydrogen economy in Europe
- Carbon handprint of Finnish Hydrogen cluster exceeding many times the Finnish net emissions (baseline 2018 level)


All members and more information
www.h2cluster.fi

THANK YOU!