

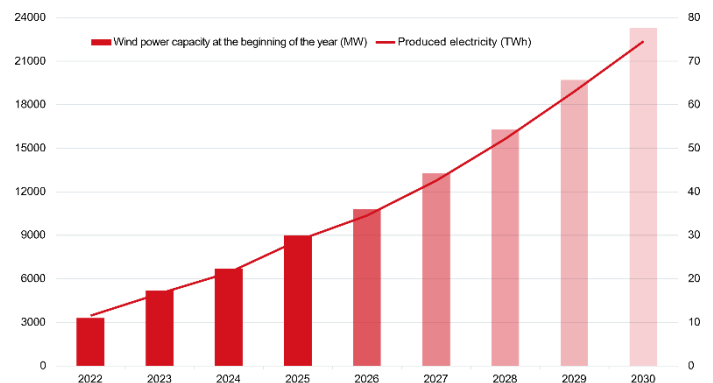
## FINLAND – EUROPEAN LEADER IN CLEAN HYDROGEN ECONOMY 2030

### THE HYDROGEN ECONOMY ENSURES A CARBON-NEUTRAL FUTURE AND ENERGY INDEPENDENCE

Hydrogen has been known as an energy carrier for over two centuries, and the hydrogen economy is considered one of the cornerstones of the future energy system. Hydrogen produced with renewable emission-free energy can also be used to contribute to the achievement of industrial carbon neutrality, as it enables the production of green steel and chemicals. What is more, hydrogen produced with renewable emission-free energy can also be used to produce carbon-neutral transport fuels.

**1. Industrial production is currently being redistributed.** Europe is striving for carbon neutrality, which, in practice, means replacing fossil fuels with clean electricity, as well as with hydrogen and its derivatives. Making the transition by 2050 will take an investment of EUR 28,000 billion in energy production, the processing of clean raw materials and other parts of the value chain<sup>1</sup>. Not everything can be electrified. In the future, energy-intensive industry will be most prominent in countries that can offer clean electricity and hydrogen at the most competitive price.

**2. Finland can offer a great deal of clean electricity at a price that is competitive in Europe,** despite the fact that the energy crisis due to the war in Ukraine is increasing prices everywhere. Finland is competitive because of the enormous potential for building new wind power capacity and a strong electricity grid. For example, the cost of wind power production may be over 30% lower in Finland than in the reference countries. Hydrogen can also be used for storing electricity in case of an occasional surplus. When, on the other hand, there is a shortage, hydrogen can be converted back into electricity.



**Projected growth in wind power capacity by 2030 (MW)**  
Source: Fingrid Oyj

**3. Finland needs a practical hydrogen-economy leap,** although, thanks to extensive technical expertise, Finland already has great potential to produce hydrogen, as well as for the related technologies and solutions. Finland can be even better and more attractive if sufficient wind and solar power production is ensured, the infrastructure required for the transport and storage of hydrogen is guaranteed and the market environment is developed quickly.

**4. The hydrogen economy is an extremely large, new industrial sector,** which enables energy independence, increases employment and guarantees a carbon-neutral future both in Finland and globally. In the near future, Finland can be part of the European hydrogen market with reliable connections, while creating local production with a high level of processing and promoting the export of Finnish technology and services to increase the carbon handprint. Finland has the potential to produce up to 45% of all the clean hydrogen needed for the REPowerEU plan.

<sup>1</sup> <https://www.mckinsey.com/capabilities/sustainability/our-insights/how-the-european-union-could-achieve-net-zero-emissions-at-net-zero-cost>

## Part of new industrial-policy thinking

The production of green hydrogen requires a significant amount of electricity produced using wind and solar power. The smoothness of the permit-granting process is key in the achievement of sufficient capacity. The weather conditions in Finland are very favourable for low-cost production.

In particular, green hydrogen produced with clean electricity will increase Finland's carbon handprint, make the country more energy independent and employ, according to estimates, over 100,000 persons indirectly. The estimated investment potential is currently EUR 50 billion.

The RePowerEU plan will rapidly improve the conditions for the hydrogen economy. It is important to develop the hydrogen economy even more quickly, both nationally and internationally, to enable change and the achievement of set objectives. For example, Finland and Sweden have already launched joint infrastructure projects, such as Nordic Hydrogen Route – Bothnian Bay, which focuses on the building of a hydrogen pipeline in the area of the Bothnian Bay. It should be possible to create similar conditions across Finland to attract international investments – quickly.

The hydrogen economy provides Finland with the opportunity to assume a clear role as a leader in the European energy policy and base it on a new market-based hydrogen economy in which Finland is a stable and cooperative operator. Finland's role and history as an operator committed to a common EU policy supports the negotiation goal of establishing a hydrogen market all around the Baltic Sea.

In order to secure favourable EU decision-making and international investment, the Finnish government must make strong and clear decisions on the hydrogen-economy strategy and its implementation. Finland must incorporate an ambitious yet realistic vision for the future in its industrial-policy thinking, even though climate policy will be the real winner.

### Messages to decision-makers regarding the hydrogen cluster:

1. Finland should define the hydrogen economy as a key growth sector and ensure horizontal policy coordination between different government sectors
2. Finland must promote EU regulation that takes account of Finland's competitive advantages and special characteristics
3. Finland must implement EU legislation in a manner that takes account of national competitive advantages
4. Finland must ensure adequate national resources and practices for the acquisition of appropriate permits for both renewable energy and hydrogen investments
5. Finland must ensure that the electricity and hydrogen grids are ready for the increasing capacity of renewable energy

**H2 Cluster Finland.** In early 2021, Finnish operators in the field of the hydrogen economy established a joint body, which includes more than 60 companies and 6 other organisations representing the entire value chain. The operators belonging to Hydrogen Cluster Finland aim, by 2030, to provide international services and products to help build a carbon-neutral society and provide solutions to support decision-making.