NORDIC HYDROGEN ROUTE

BOTHNIAN BAY

NEW INFRASTRUCTURE ENABLING CHANGE

Driving decarbonization, regional green industrialization, economic development, and European energy independence

GASGRID

NORDION ENERGI

What is the purpose of this collaboration?

Both Gasgrid Finland and Nordion Energi have identified hydrogen as a key influencing technology affecting the future energy system. The companies have also identified a potential hydrogen demand of around 65 TWh a year and foresee a need to develop a cross-border hydrogen market and transmission infrastructure in and around the Bothnian Bay. Based on this demand scenario, the parties plan to investigate the possibilities to develop the first cross-border integrated transmission scale hydrogen infrastructure.

Gasgrid Finland and Nordion Energi cooperate currently under the umbrella of the European Hydrogen Backbone (EHB), which is an initiative consisting of 23 European gas-TSOs working together to plan a pan-European dedicated hydrogen transport infrastructure. Gasgrid Finland and Nordion Energi agree that a natural next step for EHB during 2022 would be a more advanced, regional analysis to assess the hydrogen- and hydrogen infrastructure potential in the Nordic region, starting with a focus on the Swedish and Finnish region.

How much will the project cost and how is it financed?

The total system investment, including the expected funds needed to build new pipelines as well as their associated systems like compression, is expected to be in the range of 3.5 billion Euros / 35 billion SEK. The expected transportation cost for hydrogen will be in the range of 0.20-0.35 €/kg H2 / 2.1-3.6 SEK/kg H2. The level of investment will depend on factors like the number of connections and compressors, routing specifics, and more precise supply and demand figures. Gasgrid Finland and Nordion Energi are funding the investigation phase and are developing a strategy for raising development capital.

Why is a hydrogen pipeline network needed?

To transport energy from renewable electricity generation sites to the end user, where hydrogen is the desired end product, hydrogen pipelines offer:

- Up to 2-4 times more cost-efficient energy transport than electricity powerlines would offer. Therefore, a pipeline will reduce the overall cost of using hydrogen to attain climate neutrality for both the industries using it and Finnish and Swedish citizens.
- A secure hydrogen supply, with pipelines less exposed than shipped imports to the global market and guaranteeing the delivery of regional supply to regional demand
- Highly flexible and robust energy transportation and supply, with the pipes acting as a storage vessel
- A more integrated energy system, ensuring fuller wind utilisation in Finland and Sweden
- High social acceptance due to limited visual interference compared to electricity grids, and robust permitting processes ensuring that community needs are addressed
- An economy of scale via a large transmission network, which allows for a diverse and open access hydrogen market, commodifying hydrogen and decreasing risks and costs for new investors

How can low-carbon hydrogen drive decarbonisation?

For many sectors, direct electrification is not feasible as a decarbonisation solution given their reliance on fuels or gases to power processes or provide high-temperature heat. Therefore, renewable and low-carbon gases like low-carbon hydrogen have an important role to play to reach the EU's climate goals. Examples include the steel sector, where hydrogen provides an alternative reducing agent in the production process, and the use of hydrogen as a feedstock in the production of e-fuels such as e-methanol, which will replace carbon-intensive fuels currently used in shipping and aviation, but also replacing fossil industrial feedstock, e.g. fossil methanol, in the chemical industry.

What are the biggest challenges?

The energy sector is going through a significant transformation. There are some challenges that need to be overcome at the system level, but also big opportunities. There is significant business potential in the hydrogen economy and the development of value chains. The emergence of a new hydrogen industry can create opportunities for growth, jobs, and regional well-being. These will be studied in more detail in potential future phases of the partnership.

What is needed in terms of political decisions?

For such large scale, cross-border infrastructure projects to succeed, clear regulatory standards and funding schemes at both a national and European level are required. The Nordic Hydrogen Route will work together with the respective political bodies to help shape these regulations, to leverage the knowledge and experience of all involved stakeholders.

Nordic Hydrogen Route *is an initiative between Gasgrid Finland and Nordion Energi to accelerate the creation of a hydrogen economy by building up a cross-border hydrogen infrastructure in Bothnian Bay region and an open hydrogen market by 2030. The aim of Nordic Hydrogen Route is to drive decarbonization, support regional green industrialization, economic development, and European energy independence. The companies seek to develop a network of pipelines that would effectively transport energy from producers to consumers to ensure they have access to an open, reliable, and safe hydrogen market.*