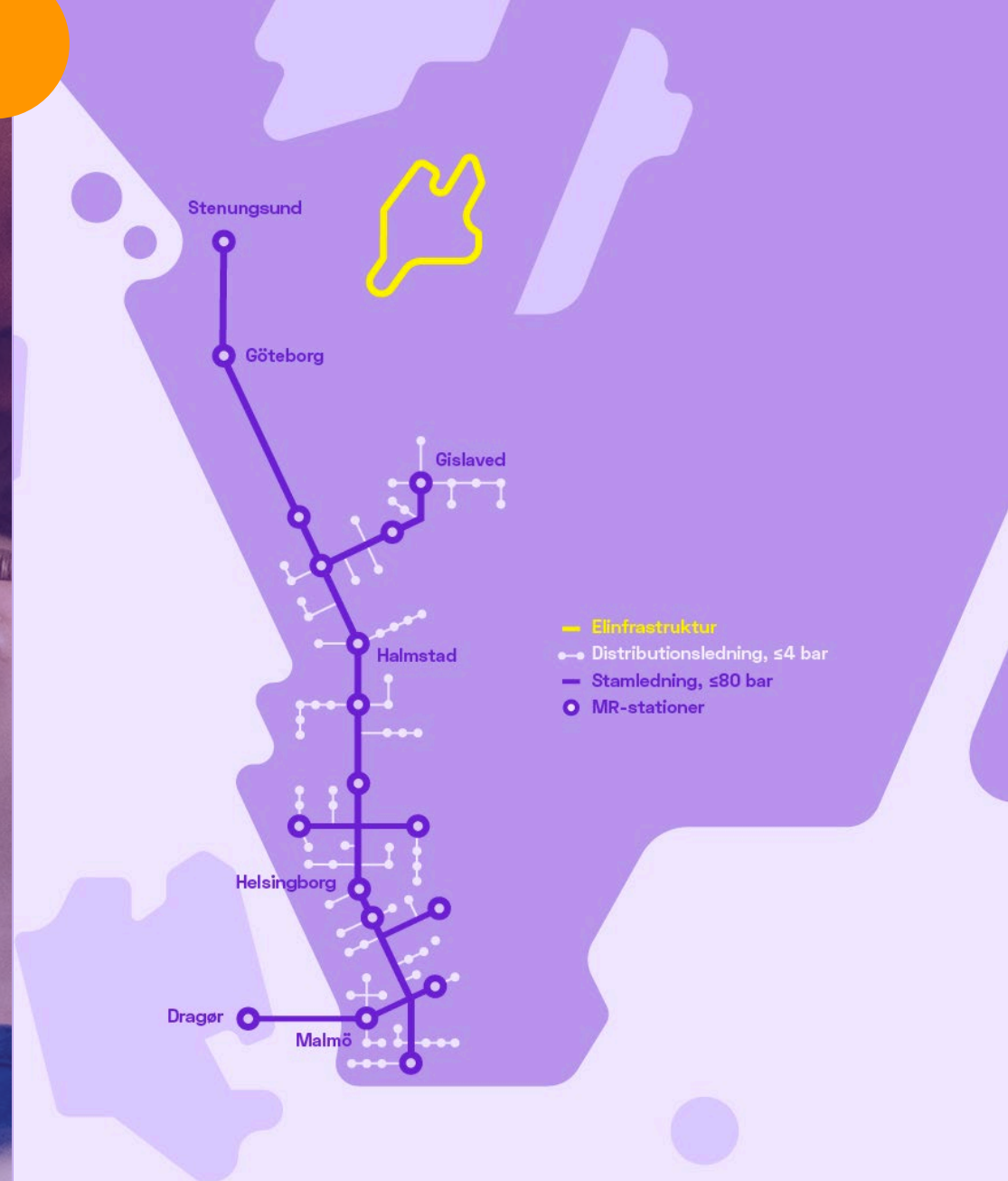


Baltic Sea Hydrogen Collector and next

- How to enable access to markets, connecting and creating an energy system

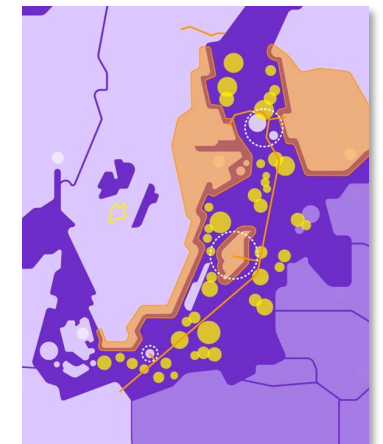
Björn Santana Arvidsson
vVD Nordion Energi H2

- Electricity and gas infrastructure
- Gas-TSO with 99,999 % security of supply
- Owned by EDIF II
- Target to be first in Europe with 100 % green gas 2030
- Taking a lead in innovation projects - liquid biogas, CCUS and hydrogen



Project of Common interest

- 28 November 2023 the European Commission announced Nordic Hydrogen Route and Baltic Sea Hydrogen Collector as PCI-projects (100% hit rate)
- 8 April the European Parliament approved the projects as PCI!
- PCI-status for cross border infrastructure projects of great importance for the green energy transition of Europe
- Results in possible EU-financing as well as shorter permitting processes

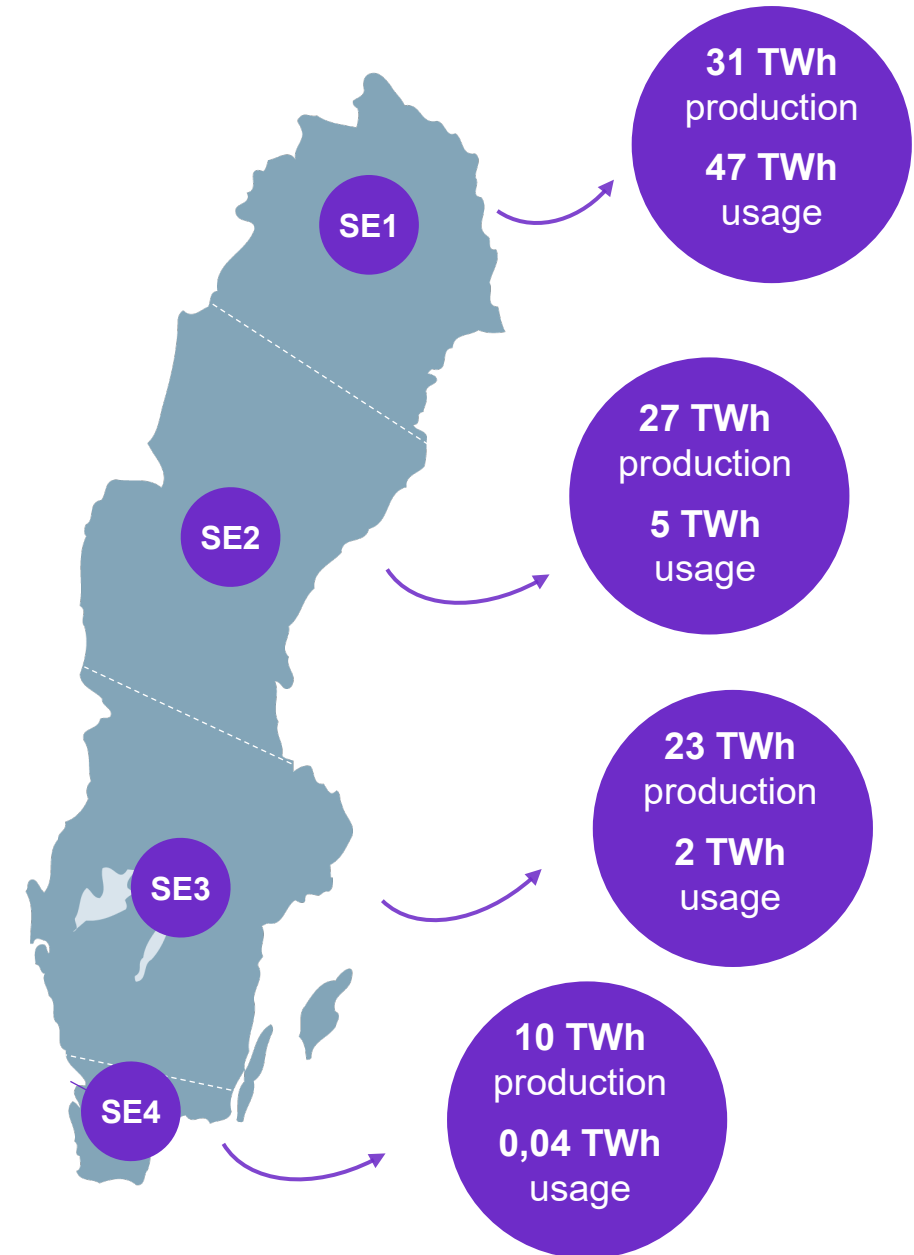


A wide-angle photograph of a person riding a snowmobile across a vast, flat, snow-covered landscape. The snowmobile is in the center-left of the frame, moving towards the right, leaving a trail of tracks behind it. The background features a dense line of evergreen trees under a pale, overcast sky. The entire image has a soft, blueish-purple tint.

The need of hydrogen

Plans in Sweden, requires connection between

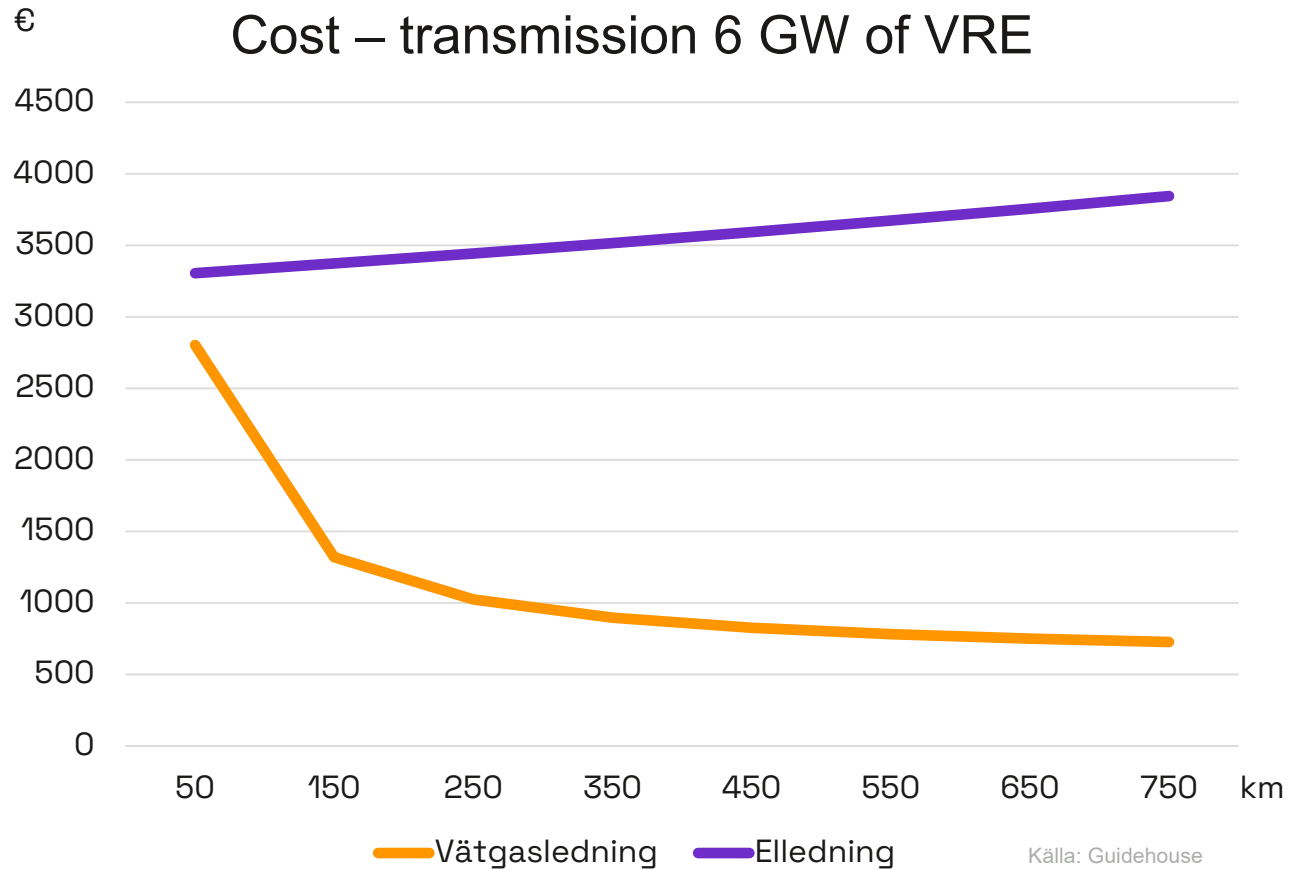
- Our market investigation 2023 gave in-depth intelligence of the industries needs and plans
- The industry's need of energy and input product – security of supply and cost efficient
- Production and usage:
29 companies, 50 projects, needs starts 2028
- The hydrogen infrastrucutre meets the need of the industry – access to energy, bridges long distances
- Off-grid solutions, start at production and not at the electricity grid



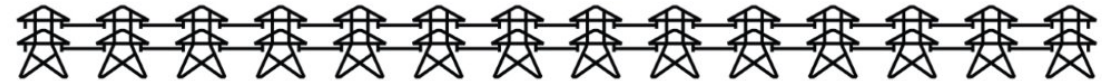
Benefits with hydrogen infrastrucutre

- **Pipe under ground**
minimum impact on nature and society
- **Huge capacity in a single pipe**
- **Bridges over long distances**
enables and ties together production and usage
- **Cost efficient transmission**
4-5 times more cost efficient





Use of land for transmission 42 GW



14 high voltage powerlines

1000 meters wide



One 1,2 m pipeline underground

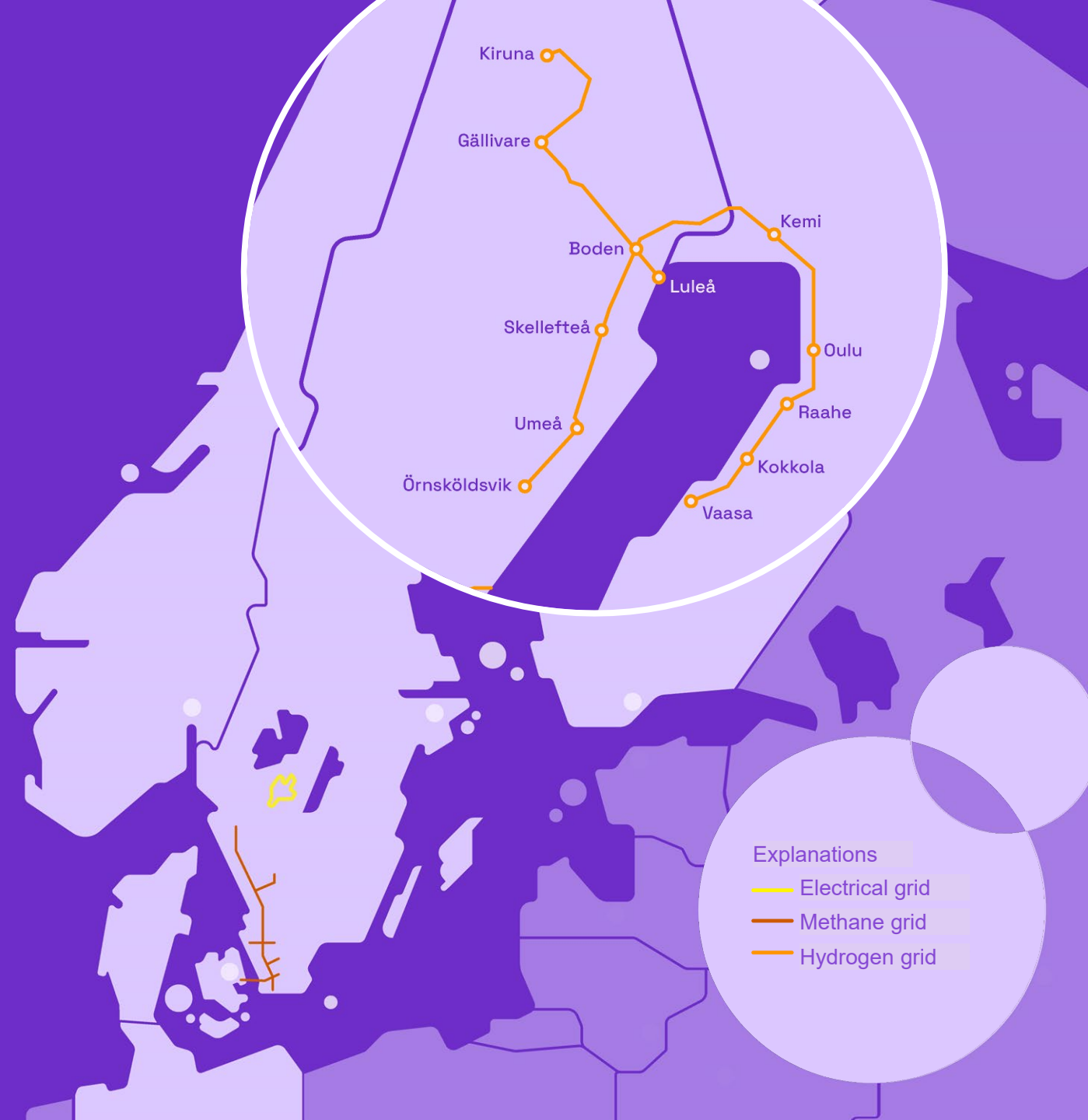
20 meters wide

Källa: H2ESIN report



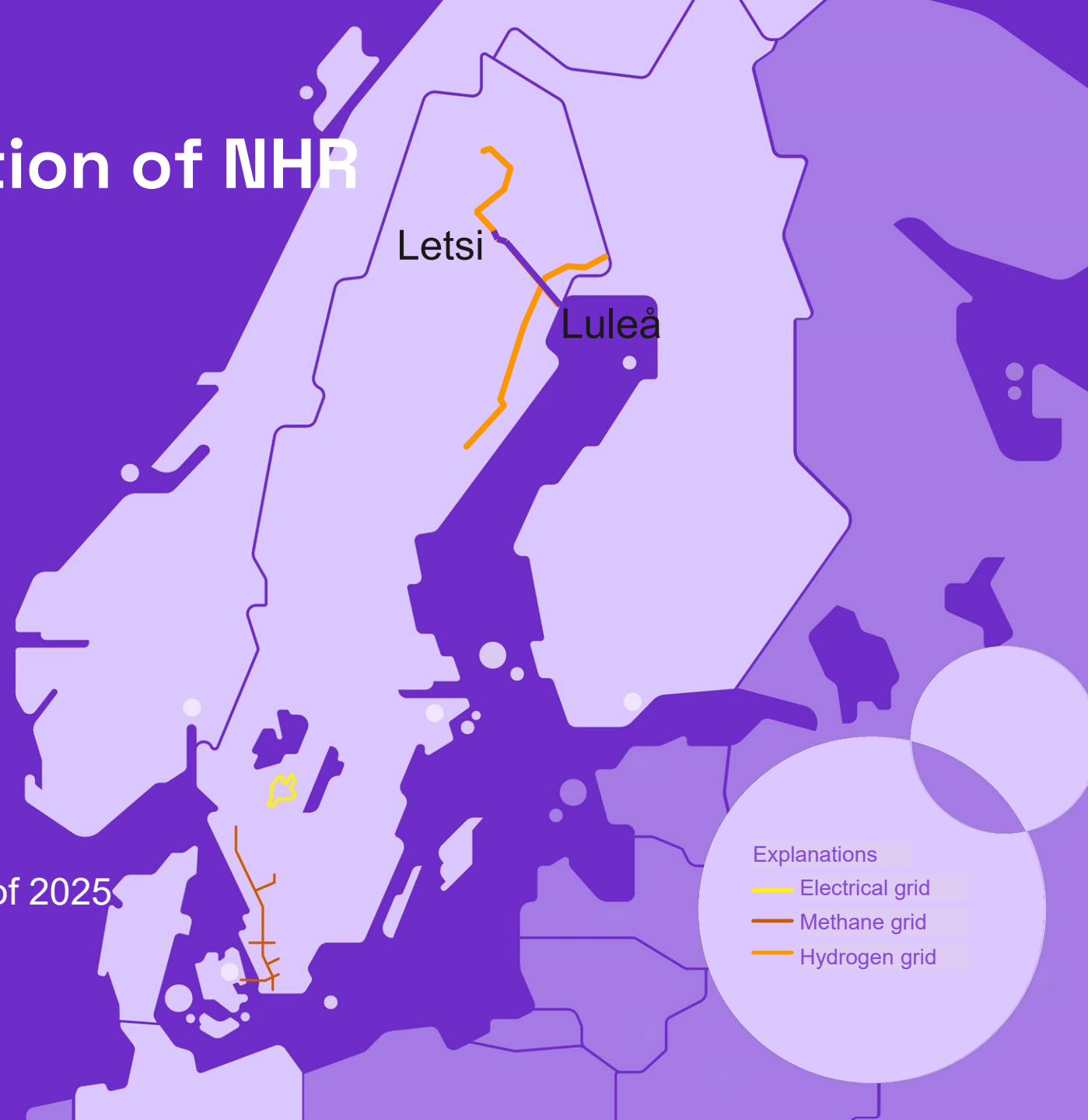
Nordic Hydrogen Route

- PCI status 8 April (EU-Parlament)
- CEF application
- Power2Earth acts as the first section
- Pre-study on offshore alternative
- Analysis on impact of Open Season input
- Electrical/H2 system analysis SE/FI on-going
- Co-laying electrical/H2
- Match making event in H2, connecting SE demand with FI supply



Power2Earth – First Section of NHR

- **150 km hydrogen underground pipeline** connects Letsi with Luleå
- **First section of the Nordic Hydrogen Route** based on the needs we take action
- **Early consultations initiated** permitting process initiated, consultations being planned for the next phase
- **Open access** will be open for access, production and usage of hydrogen
- COD end of 2028 based on successful FID end of 2025



Sweden's first green production of ammonia and fertilisers

- Unique project between Fertiberia, Lantmännen and Nordion Energi
- Sweden's first production of fertilisers coupled with large scale hydrogen production. Flexibility is a key feature throughout the value chain.
- Secures supply of food in Sweden through domestic production and supply
- Accelerates the green transition in agriculture



Baltic Sea Hydrogen Collector

- PCI status 8 April (EU-parlament)
- CEF application
- Cooperation agreement with Gascade
- Open Season phase two to start.
- Permitting to start with mapping



West Coast Initiative

- Already high usage of hydrogen
- Current core market
- Hydrogen valley application with Nordion participation on infrastructure



A national hydrogen system



West coast

Hydrogen infrastructure along the existing gas infrastructure for NG/BG.



National future connections

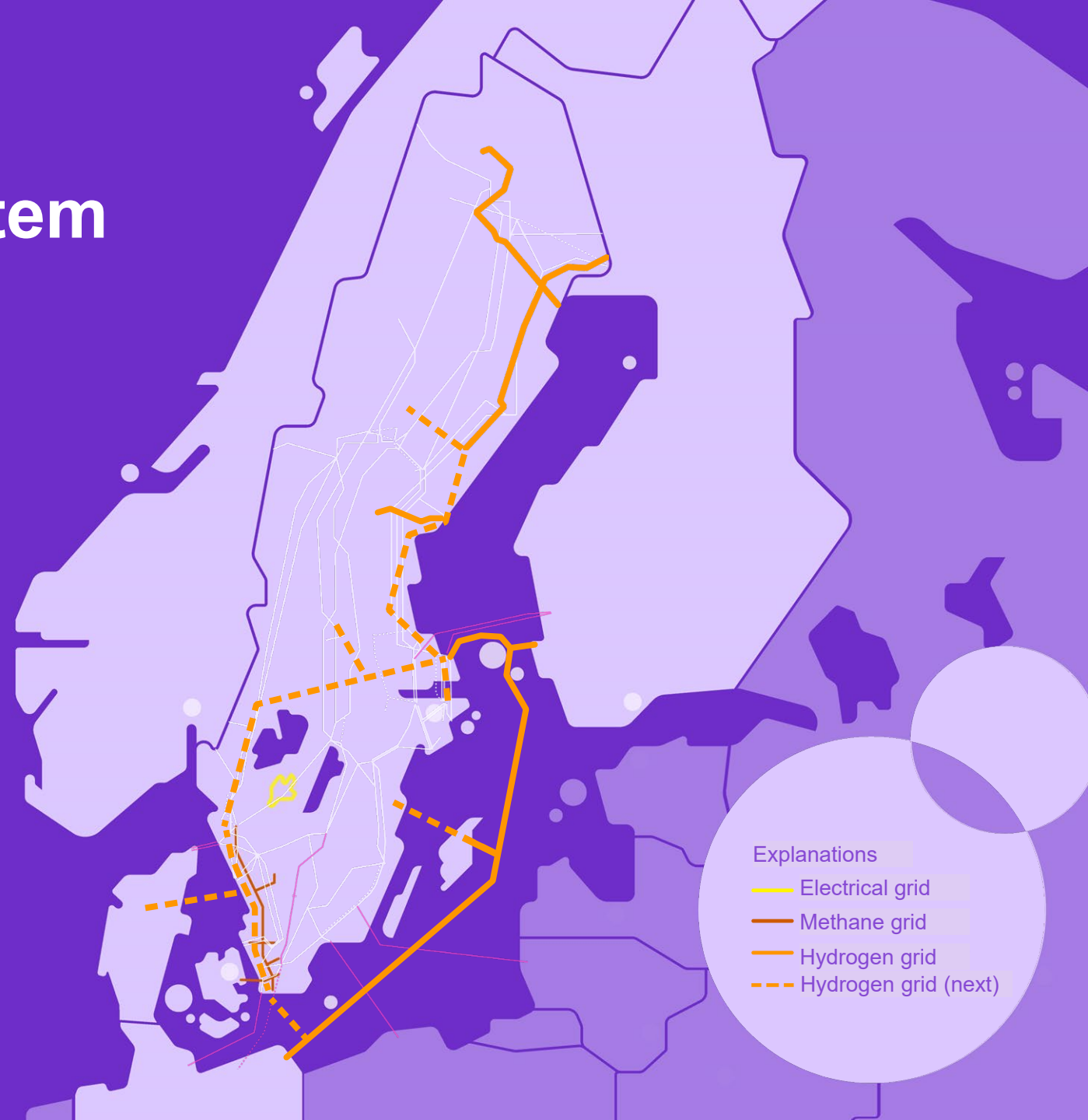
The need from society and industry steers.



Sweden's new energy system

Co-planning of hydrogen infrastructure and electricity grid, sets the foundation of Sweden's new **energy system**.

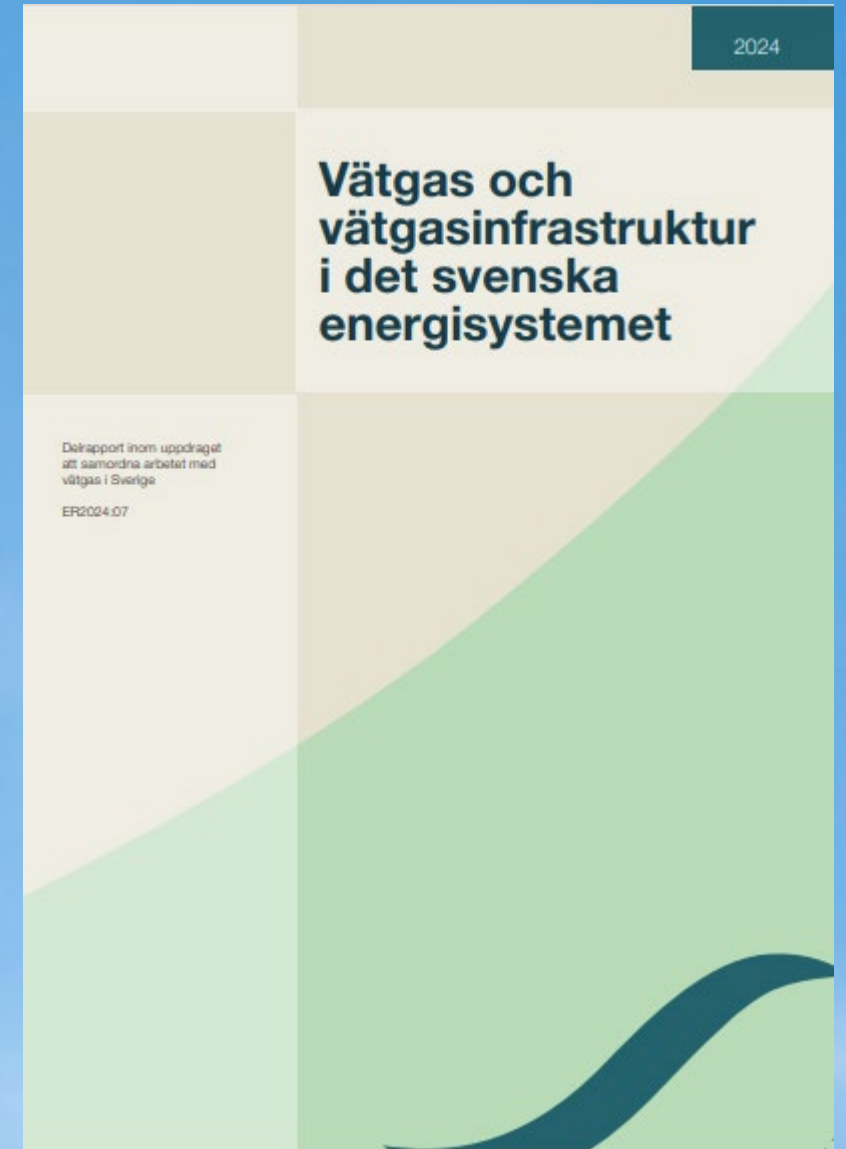
- Sector coupling for flexibility and capacity (H₂/el/heating/bio mass/BG)
- Cost efficient transmission to customers
- Sweden self supplying, security of supply!



Energy Agency report 26 March

- Methane and hydrogen, focus on gas infrastructure (“keep it together”)
- Knowledge, competence and experience essential
- The rules and regulations are sufficient to start now, improve/clarify/complete as we go!
- Co-planning and cooperation for sector coupling

=> Conclusion – go, now! ...and Nordion Energi is!



ENNOH (European Network of Network Operators for Hydrogen)

- The gas TSO's in Europe together with the EU-commission - coordinate planning, development and operation of Europe's hydrogen infrastructure
- Purpose – to set the framework for hydrogen infrastructure in Europe
- Nordion Energi contributes in the plenary and working group, as the sole Swedish representative
- The work shall be ready until July 2024, to be handed over to ACER



An aerial photograph of a vast, snow-covered forest landscape. The terrain is a mix of dense evergreen trees and open, snow-covered fields. In the far distance, a range of low mountains or hills is visible under a cloudy sky. On the left side of the horizon, several wind turbines are visible. The overall color palette is dominated by whites, greys, and muted blues, with a purple tint overlaid on the entire image.

Do not consider, act