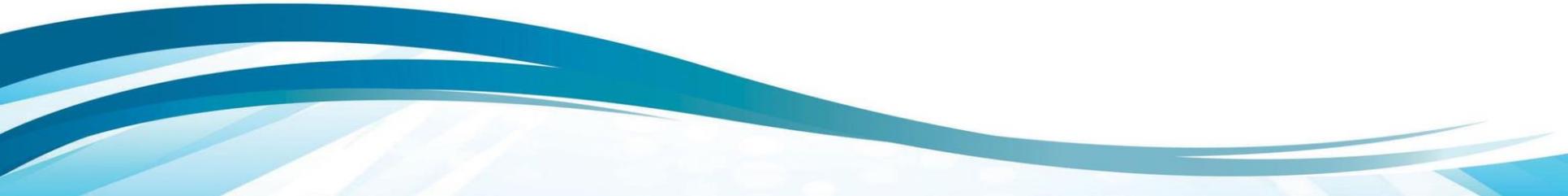


## **Development of Green Hydrogen Value Chains**

Sven Parkel  
Estonian Hydrogen Cluster

Decorative blue wavy lines at the bottom of the slide, consisting of several overlapping, flowing bands in various shades of blue.

- Main drivers today
  - Green Deal
  - Production and price volatility
  - Energy security and independence in Europe
    - Large scale energy transport across Europe

## Regional Supply and Demand, 2030 and 2040

(TWh)<sup>1,2,3</sup>

■ Supply (2030/2040)  
■ Demand (2030/2040)

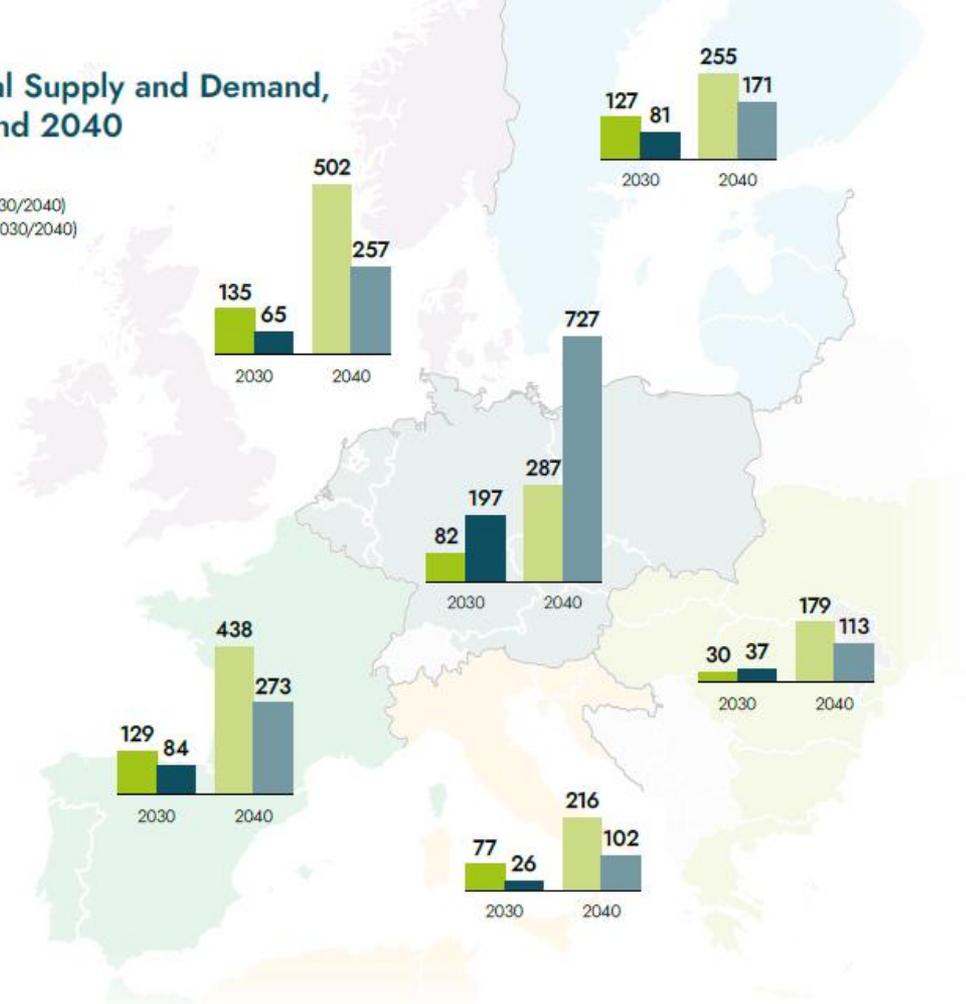


Table 4-4 Summary of identified potential offshore wind capacity in the BEMIP member countries

Country	Number of 500 MW wind farm blocks	Identified potential capacity [GW]	Potential Net Energy Production [TWh]	Total Annual	Highest capacity factor site	Higher capacity factor [%]
Denmark	39	19.5	70.7		DK54-1 Rønne Banke,	42.5
Estonia	14	7.0	24.0		EE New Saarema-1/2	40.3
Finland	16	8.0	26.0		FI New Aalands Hav-1/2	40.9
Germany	16	8.0	29.1		DE Baltic 2, Baltic 2 area	42.6
Latvia	29	14.5	49.2		LV07-2 Baltic Wind Park Phase 1	40.5
Lithuania	9	4.5	15.5		LT New #4-1/2	40.3
Poland	24	12.0	43.2		PL Baltyk Północny phase 1/2	42.4
Sweden	40	20.0	68.2		SE New Oelands Soedra 1/2	42.8
<b>Total</b>	<b>187</b>	<b>93.5</b>	<b>325.9</b>			

*Note: The site with the highest capacity factor is not necessarily the most economic. The modelling undertaken in Task 2 accounts both for differences in site-specific costs and in the value of site output when selecting sites to develop.*

Hoonestusloa menetlus on algatatud

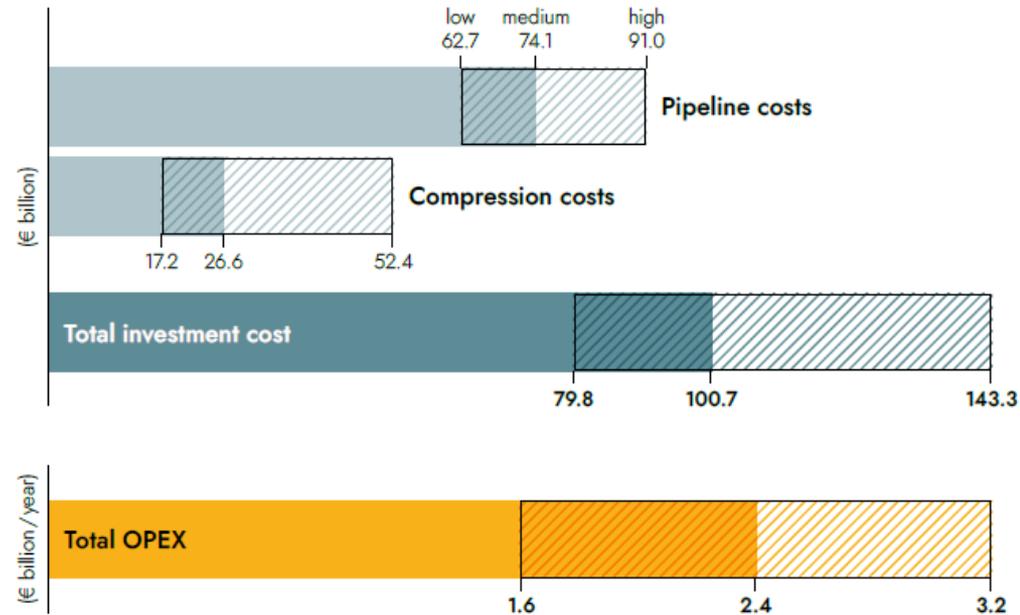
Company	Area	Power	Project initiated in
<a href="#">Enefit Green AS</a>	Hiiumaa	1100 MW	2006 2010 (water use permit)
<a href="#">Enefit Green AS</a>	Liivi	1000 MW	2010
Five Find Energy	Nasva (near-shore)	4 MW	2011
<a href="#">Tuuletraal OÜ</a>	Liivi laht	380 MW	2013
<a href="#">Saare Wind Energy OÜ</a>	Saaremaa	1400 MW	2015
<a href="#">Utilitas</a>	Saare-Liivi 5	5980MW	2021

Based on the cost figures shown in Table 1, the total investment costs of the envisaged 2040 European Hydrogen Backbone are expected to range from €80 to €143 billion<sup>22</sup> covering the full capital cost of building new hydrogen pipelines and repurposing pipelines for the European hydrogen backbone. Annual operating costs are estimated to be between €1.6 and €3.2 billion when assuming a load factor of 5,000 hours per year<sup>23</sup>. An overview of these costs is given in Figure 4.

**FIGURE 4**

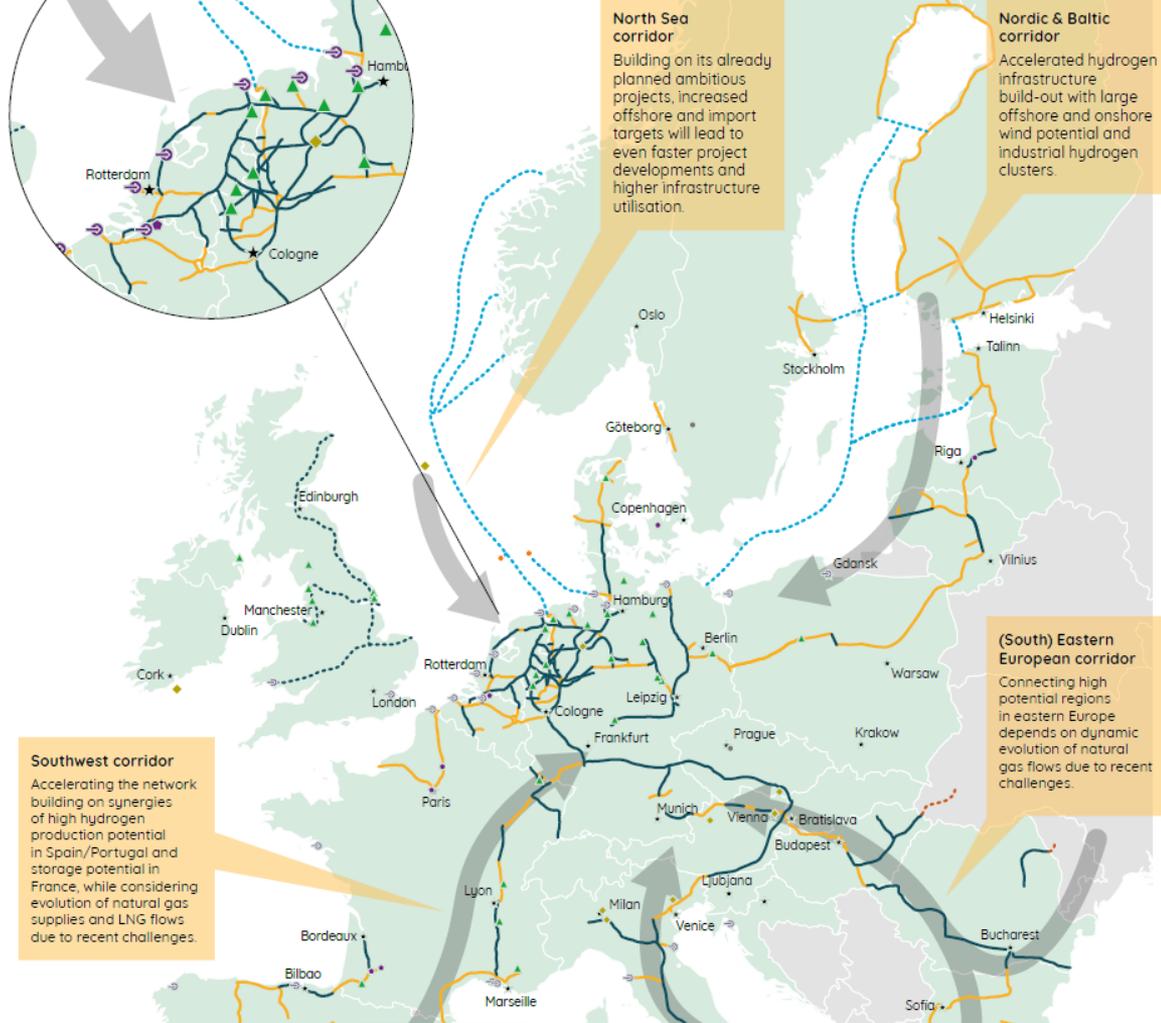
**Estimated investment and operating costs of the European Hydrogen Backbone (2040)**

-  Range depending on input assumptions as described in Appendix A
-  Range depending on input assumptions as described in Appendix A
-  Range depending on input assumptions as described in Appendix A

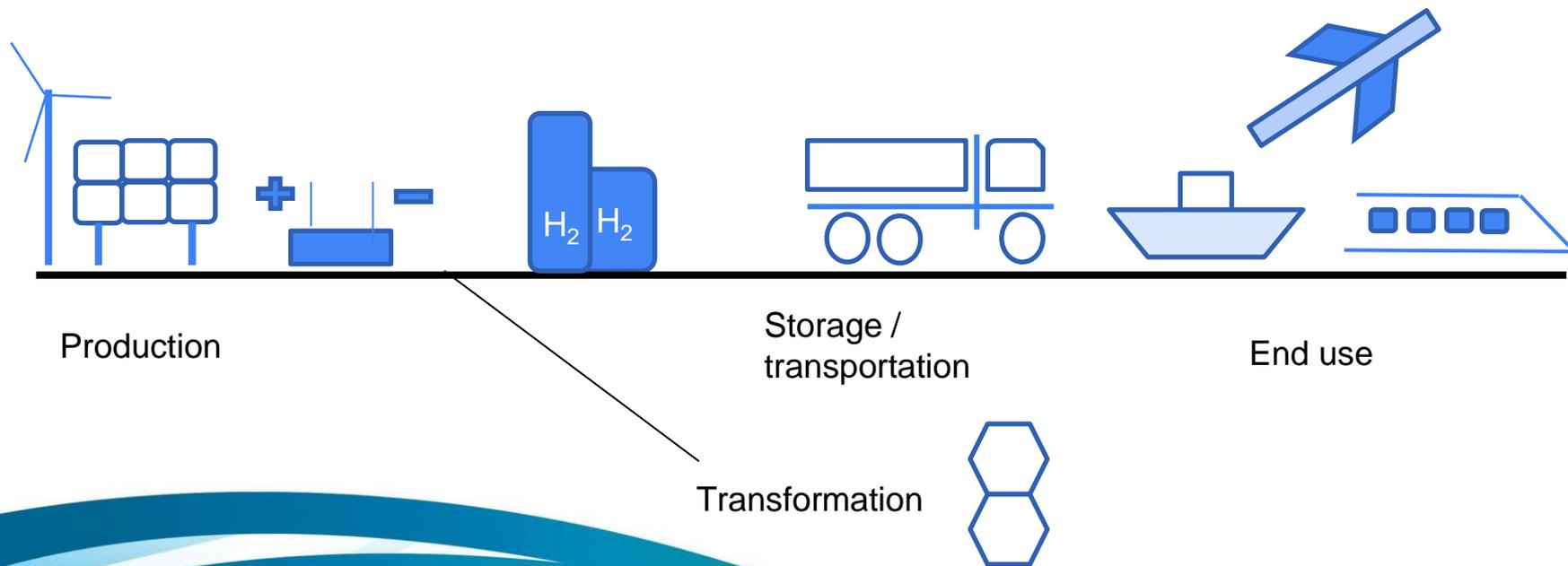


**Figure 1 – 2030**

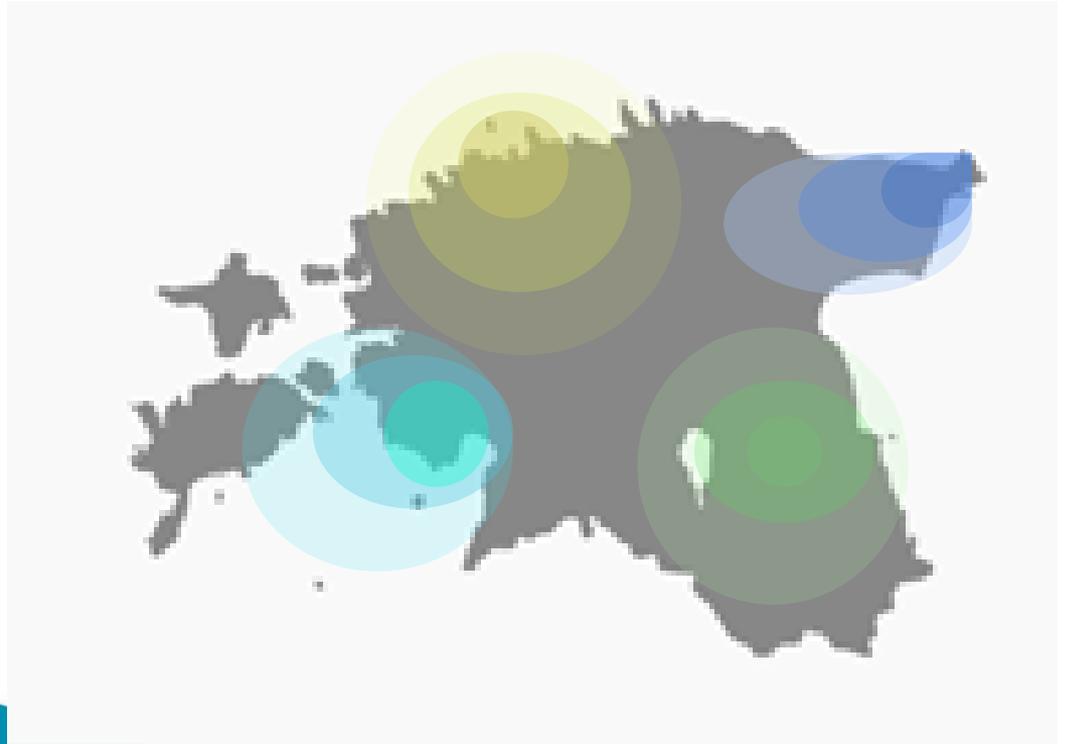
**Accelerated and updated 2030 EHB network supports the EC's REPowerEU ambition to create a domestic and import market for hydrogen and increase European energy system resilience**



• Full value chain development – local context



Regional value chains



Tootjad	Transport/hoiustamine	Lõpptarbija
Estiko (20+ MW) SkyCorp	Estiko SkyCorp	Kutsehariduskeskus Estiko AuveTech
TÜ A Le Coq	Terminal TÜ	A Le Coq Terminal SkyCorp
Väärindamine	Arendus	Väljaõpe
Estiko TÜ	AuveTech SkyCorp	Kutsehariduskeskus
	Rohekiirendi	SkyCorp TÜ

**Tootjad**

Thara  
Eesti  
Energiat

**Transport/hoiustamine**

Atrado Alexela Tallinna  
Lennujaam  
Eesti Tallinna  
Energiat Sadam Thara

**Lõpptarbija**

Thara Tallinna  
Lennujaam  
TLT XFly  
Eesti Tallinna  
Energiat Linn Tallinna  
Sadam

**Väärindamine**

SkyNRG

**Arendus**

XFly KBFi  
ZeroAvia  
TalTech  
Universal Hydrogen

**Väljaõpe**

XFly KBFi  
TalTech

## •Support measures

- Pilot project for green hydrogen in transport, 4,8 mil EUR

Utilitas / Pressiteated / Utilitas ja UG Investments rohevesiniku tervikahela projekt sai positiivse rahastusotsuse

# Utilitas ja UG Investments rohevesiniku tervikahela projekt sai positiivse rahastusotsuse

23.12.2021



**Energiakontsern Utilitas ja UG Investments (UGI) vesinikuprojekt saab Keskkonnainvesteeringute Keskuselt ja Majandus-ja Kommunikatsiooniministeeriumilt viis miljonit eurot rohevesiniku tervikahela rajamise kaasrahastuseks. Rohevesinik võetakse kasutusele ühistranspordis ja projekt peab olema valmis 2024. aasta novembri lõpuks.**

## In European Value chains...

- Value chains
  - European Hydrogen Backbone
  - Decarbonizing TEN-T, maritime solutions, aviation, etc

### Estonia (Elering)



I gas pipelines (repurposed)



● Full value chains in the transport sector

- Tallinn
  - Tartu
  - Narva
- Busses
  - Taxis
  - Maritime
  - Aviation



● 2030



●2035



- Full value chains in the build environment
  
- Storage of energy from PVs
  - Potential for sector coupling

- Large scale energy transport
  - Large scale offshore windfarms
  - Onshore windfarms
  - Solar
  - CHP

- Hydrogen Valley
  - Flagship status

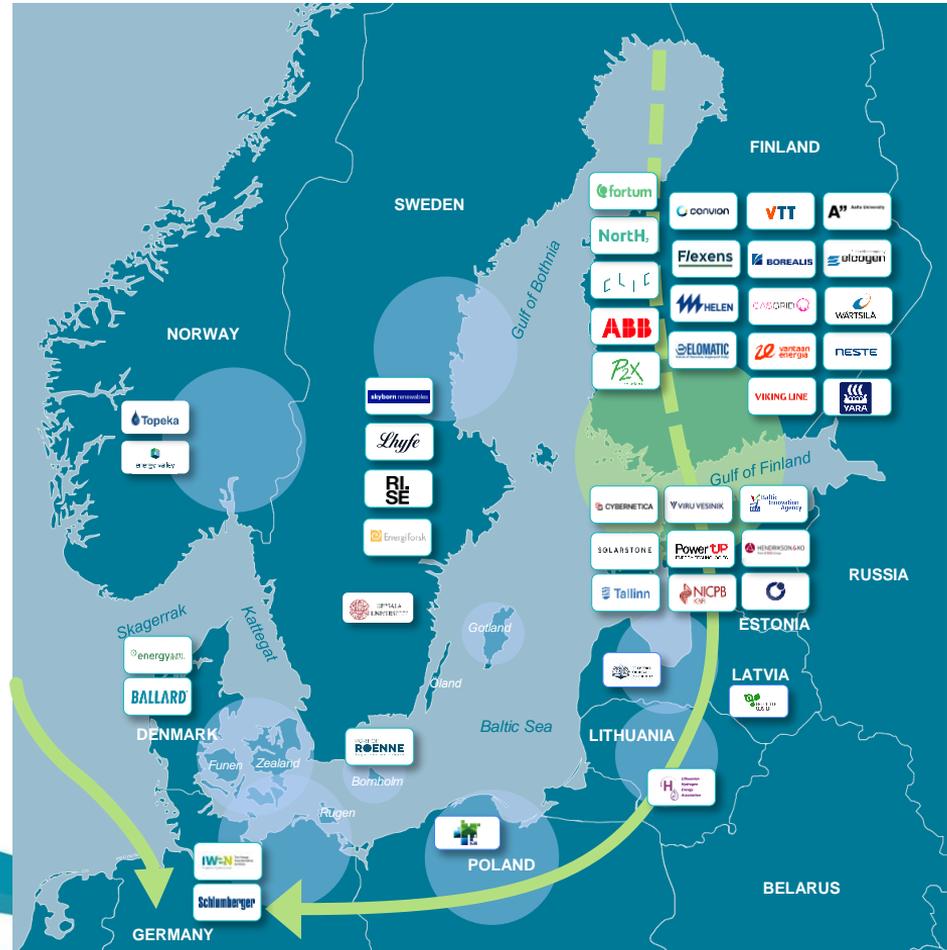


# Mission Innovation Hydrogen Valley Platform

Showcasing hydrogen flagship projects around the world: A platform for project developers

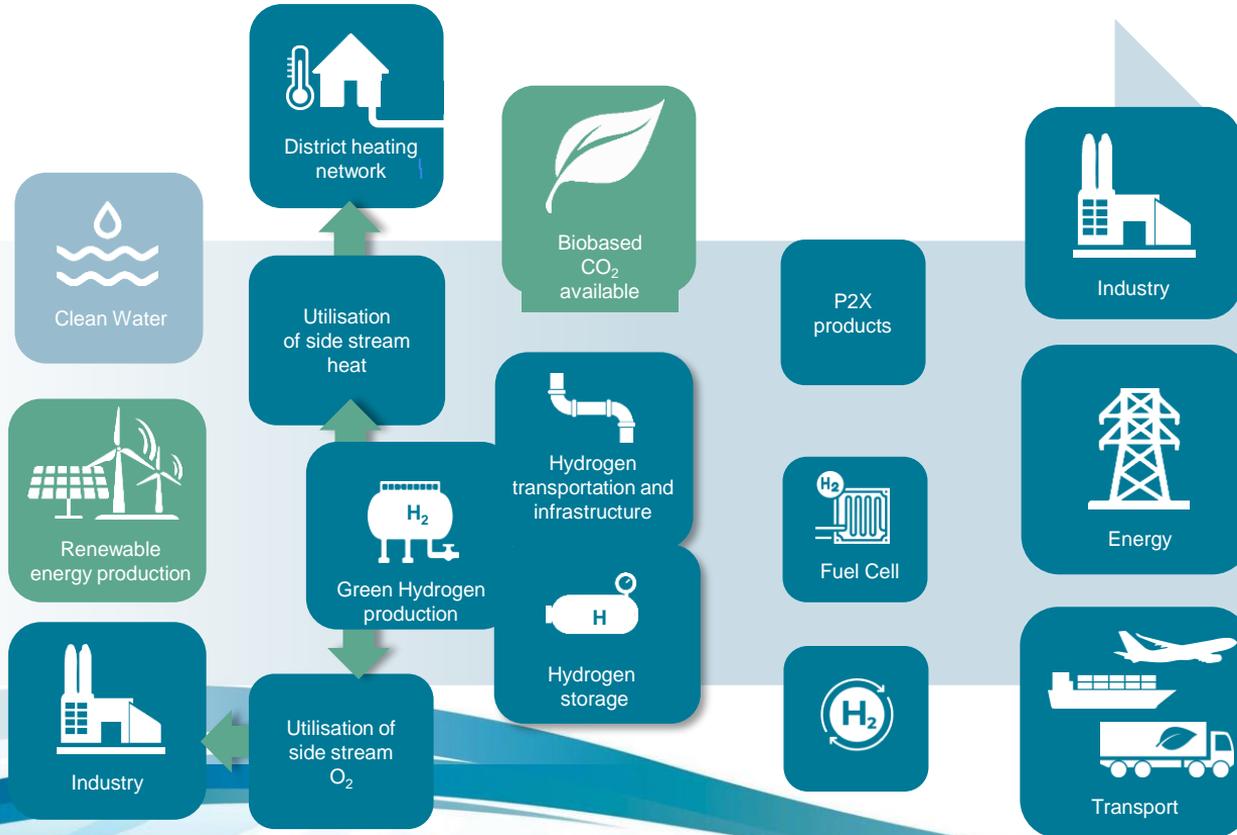
[LEARN MORE](#)

- Transport
  - Maritime
  - Road
- Industry
- Energy
- Joint market development





# Maximizing the value of Sector integration

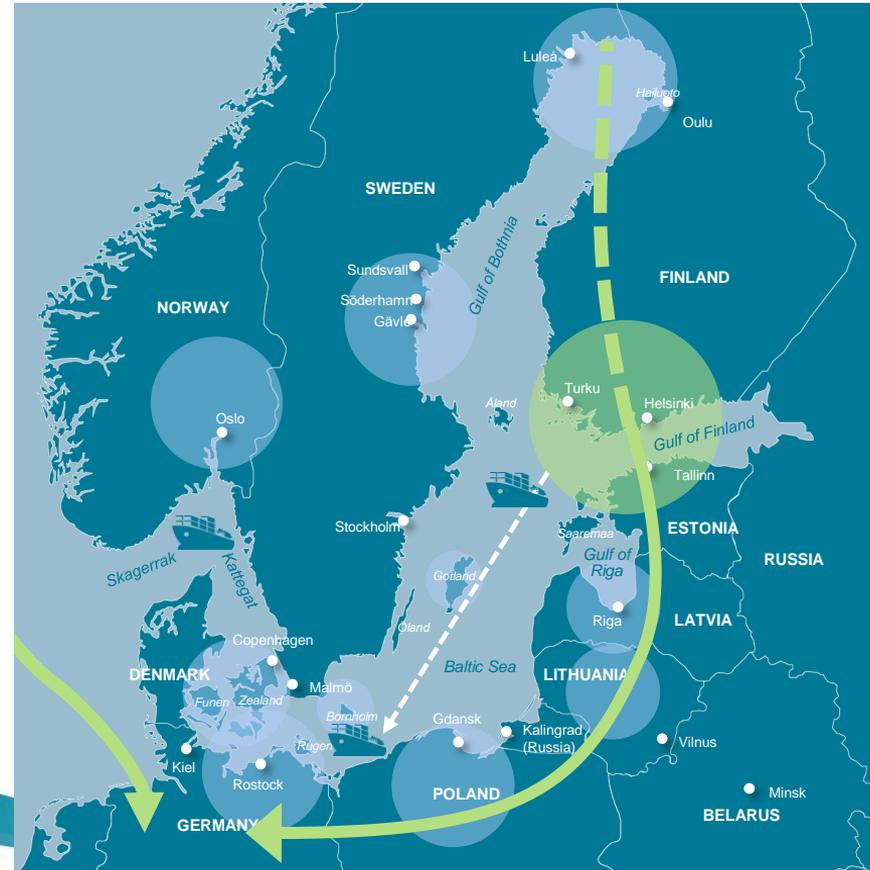


HYDROGEN MARKET

REGULATORY FRAMEWORK

## Northern European Alliance

- Look for EU funding opportunities
- Strengthen the development of cross-border value chains
- Knowledge sharing, social awareness
- Energy security of the region



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Toetas Eesti Riik



KESKKONNAINVESTEERINGUTE KESKUS



KESKKONNAMINISTEERIUM