BEMIP HYD 8 (Less Advanced)

Baltic Sea Hydrogen Collector

Reasons for grouping [ENTSOG]

The project group aims at interconnecting future hydrogen infrastructure between Finland and Sweden with Germany through an offshore corridor in the Baltic Sea.

The group includes investments in Sweden, Finland: Sweden (HYD-N-926 and HYD-N-931) and Finland (HYD-N-848 and HYD-N-1355).

Objective of the group [Promoter]

The Baltic Sea Hydrogen Collector (BHC) is promoted by Gasgrid Finland Oy and Nordion Energi AB and collaborators OX2 AB and Copenhagen Infrastructure Partners II P/S (CIP). The BHC's goal is to collect hydrogen produced across onshore and offshore regions and provide a main transport route from the Baltic Sea to mainland Europe, connecting hydrogen production and consumption in and around the Baltic Sea. The BHC is key to the broader European Hydrogen Backbone pipeline network, enabling exports and opening the hydrogen market by 2030. This infrastructure collects the immense renewable potential in the region, reduces reliance on natural gas from Russia, decreases dependence on non-EU hydrogen imports, and integrates Europe's main hydrogen markets.

HYD-N-848 **Baltic Sea Hydrogen Collector – Equipment [BHC] – Finland**

Comm. Year **2030**

HYD-N-1355 **Baltic Sea Hydrogen Collector – Offshore Pipeline [BHC] – Finland**

Comm. Year **2030**

HYD-N-926 **Baltic Sea Hydrogen Collector – Offshore Pipeline [BHC] – Sweden**

Comm. Year **2030**

HYD-N-931 **Baltic Sea Hydrogen Collector – Equipment [BHC] – Sweden**

Comm. Year **2030**

A. Project group technical information [Promoter/ ENTSOG]

Project technical information [Promoter]

Hydrogen Transmission

TYNDP Project code	Section name	New / Repurposing	Nominal Diameter [mm]	Section Length [km]	Compressor power [MW]
HYD-N-1355	BHC – Aland-Germany interconnector pipeline	New	1200	879	195
HYD-N-1355	BHC – Finland-Aland interconnector pipeline	New	1200	119	19
HYD-N-926	BHC – Aland-Germany interconnector pipeline	New	1200	879	195
HYD-N-926	BHC – Sweden-Aland interconnector pipeline	New	1200	160	35

Capacity increment [ENTSOG]

TYNDP Project code	Point name	Operator	From system	To system	Capacity increment [GWh/d]	Comm. year
HYD-N-1355	H2_IP_FI-ALAND(FI)	Gasgrid Finland Oy	Fork Åland	Transmission Finland (FI Hydrogen)	504	2030
HYD-N-1355	H2_IP_FI-ALAND(FI)	Gasgrid Finland Oy	Transmission Finland (FI Hydrogen)	Fork Åland	504	2030
HYD-N-926	H2_IP_SE-ALAND(FI)	Nordion Energi AB	Fork Åland	Transmission Sweden (FI Hydrogen)	504	2030
HYD-N-926	H2_IP_SE-ALAND(FI)	Nordion Energi AB	Transmission Sweden (FI Hydrogen)	Fork Åland	504	2030

B. Project Cost Information

During the TYNDP 2022 Project Data Collection, promoters were asked to indicate whether their costs were confidential or not. The following tables display the non-confidential costs provided by the promoters (as of December 2022, end of PCI project collection). The amounts provided can differ from the figures used by the project promoters in other contexts, where costs can be updated and/or evaluated using different methodologies or assumptions.

[ENTSOG]

TYNDP Project code	CAPEX [M€]	CAPEX range [%]	OPEX [M€]	OPEX range [%]
HYD-N-1355	5900	40%	53	40%
HYD-N-926	5900	40%	53	40%

Description of the cost and range [Promoter]

Pipeline CAPEX and OPEX are computed using the European Hydrogen Backbone (EHB) assumptions.

- Pipeline CAPEX of 4.8 M€/km – Source (EHB)
- Pipeline OPEX assumed as 0.9% of pipeline CAPEX

At this stage, the pipeline capital and operational costs are assumed to be equally shared between Gasgrid Finland and Nordion Energi. Meaning that the total BHC pipeline CAPEX is 11800 M€ and the total pipeline OPEX is 107 M€. Given the less advanced phase of BHC, the CAPEX and OPEX degree of cost variability is assumed to be 40%.

These numbers will be refined through the pre-feasibility assessment.

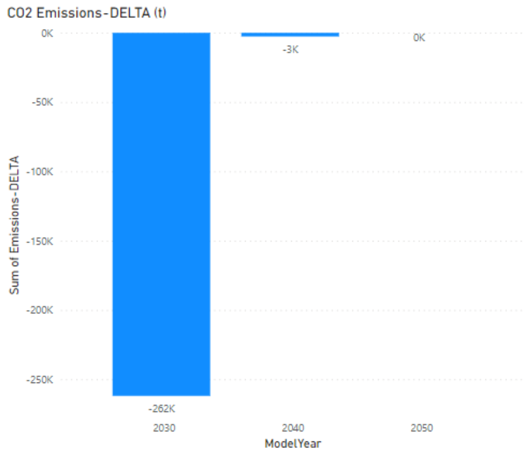
C. Project Benefits [ENTSOG]

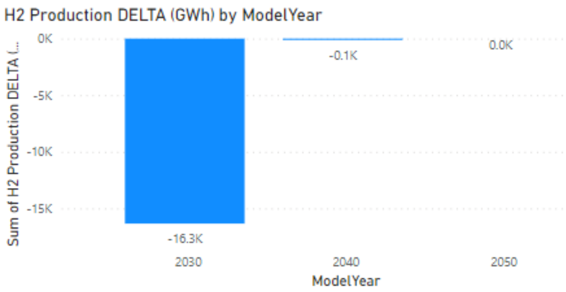
C.1 Summary of benefits

This section provides a summarised analysis by ENTSOG of the main benefits stemming from the realisation of the overall group. More details on the indicators are available in Annex D of TYNDP 2022[1].

Distributed Energy

In the reference case which analyses yearly demand in two periods (average winter and average summer), the project group will contribute to sustainability by reducing overall CO2 emissions by 262 kt in 2030. This is explained as the project group will enable replacement of blue hydrogen supplies and, therefore, will reduce natural gas imports, through the access to hydrogen supply sources.

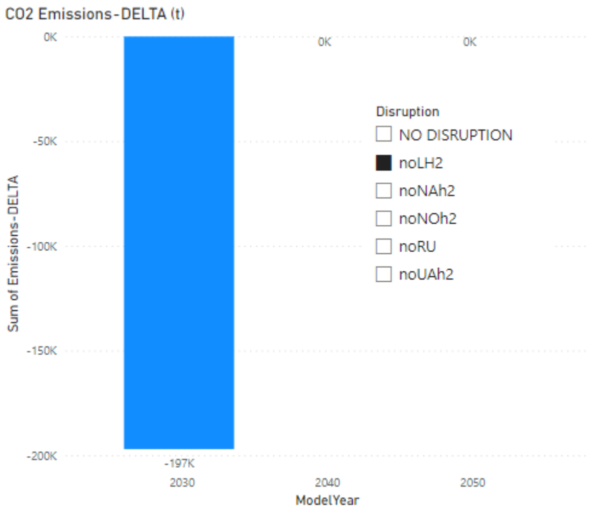


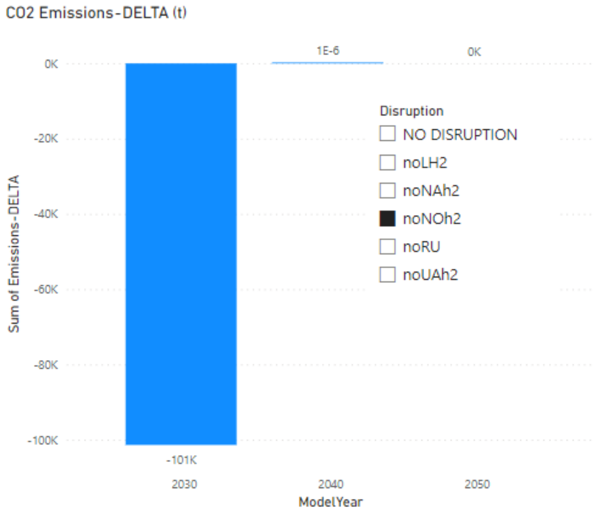


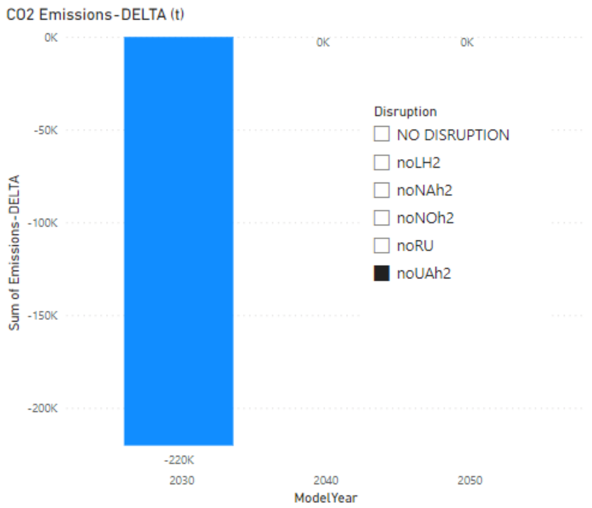
Similarly, when Norwegian, North African, Ukrainian or liquid hydrogen imports are disrupted, the project group also contributes to sustainability by reducing overall CO2 emissions in 2030, however, to a lower extent than in the reference case due to the lower availability of hydrogen supplies.

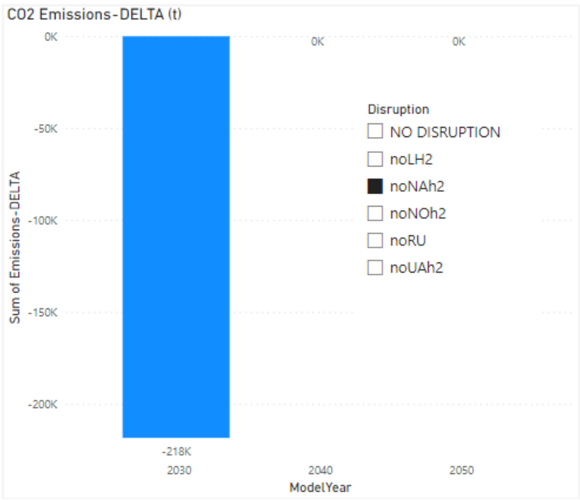
1 noLH2 : LH2 disruption / 2 noNOh2 : Norway disruption / 3 noUAh2 : Ukraine disruption/ 4 noNAh2 : North Africa disruption

[1] https://www.entsog.eu/sites/default/files/2023-04/ENTSOG_TYNDP_2022_Annex_D_Methodology_230411.pdf









Security of Supply[2]:

> Reference case

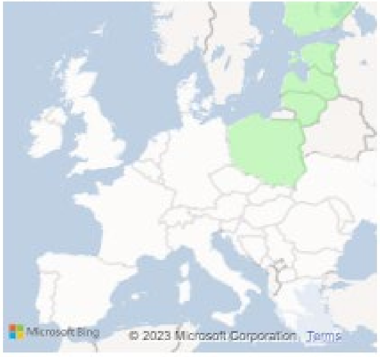
In the reference case, the project group does not contribute to the reduction of risk of demand curtailment. However, it is important to mention that the benefits of this project group could be limited by a related project group (BEMIP 2), located in the same geographical area connecting Sweden with Finland via an onshore route.

> Climatic stress cases

[2] *As for the hydrogen system there is no existing infrastructure level available yet, ENTSOG has identified a possible hydrogen network according to the information provided by promoters in their project submission for the TYNDP/PCI process (i.e., H2 Infrastructure level). Therefore, the System Assessment shows the results that could be reached (for different timestamps) under the hypothesis of a full commissioning of the H2 infrastructure projects that were submitted by project promoters but that are not yet in place. Therefore, even in configurations where no demand curtailment is identified (e.g., average winter in 2030) these results should not be read as an absence of H2 infrastructure needs for the given scenario. On the contrary, the full availability of the planned infrastructures composing the H2 infrastructure level is assumed to avoid the potential demand curtailment.*

Under climatic stress cases (2-Week Cold Spell, 2-Week Dunkelflaute and in Peak Day), due to the higher hydrogen demand the projects group will mitigate risk of demand curtailment in Finland, Baltic States and Poland in 2030.

2030 DE- Benefits



2040 DE- Benefits

2050 DE- Benefits

> Disruption cases (S-1):

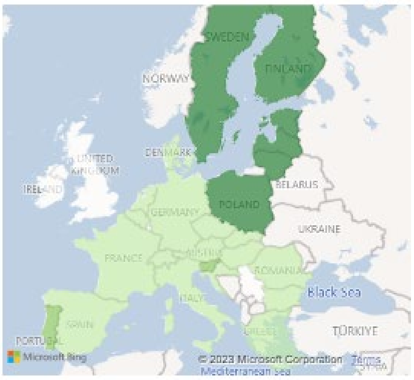
Similarly, under supply disruption cases, the project group is not further contributing to the mitigation of hydrogen demand curtailment rest.

> SLCD:

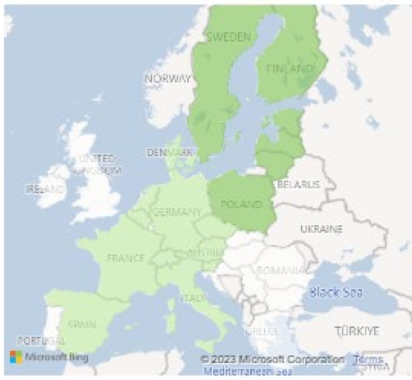
In case of single largest capacity disruption, the project group mitigates the risk of demand curtailment in 2030 by 25% in Poland and Baltic States, and by 27% in Finland and Sweden, and also by 10% (approximately) in most European countries. In addition, in 2040 project group mitigates the risk of demand curtailment by 20% in Poland ,Estonia, Finland, Latvia and Lithuania. In 2050, the projects group mitigates the risk of demand curtailment by 15% in Poland, Estonia, Finland, Latvia and Lithuania.

SLCD Benefits - 2030 - Distributed Energy

SLCD Benefits - 2040 - Distributed Energy



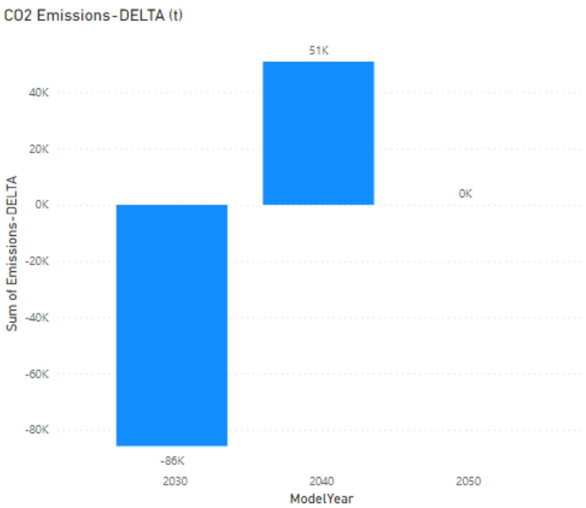
SLCD Benefits - 2050 - Distributed Energy

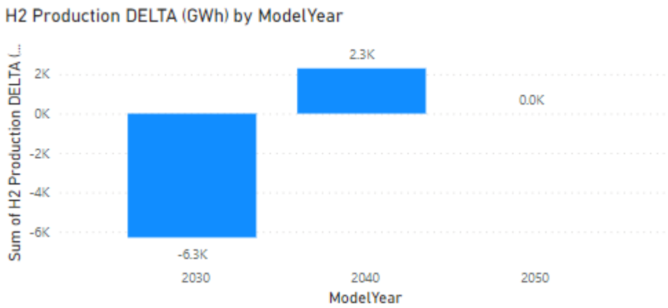


Global Ambition

Sustainability benefits

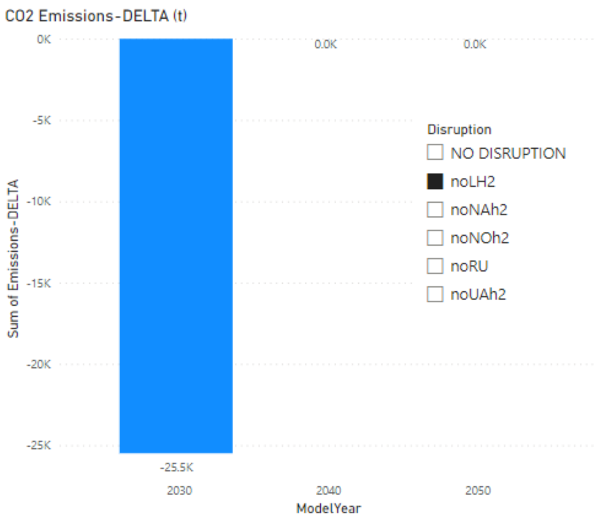
In the reference case, the project group will contribute to sustainability by reducing overall CO2 emissions by 86 kt in 2030. The project group will enable replacement of blue hydrogen supplies and, therefore, will reduce natural gas imports, with different hydrogen supply sources. However, in 2040, triggered by the higher hydrogen demand assumed for Global Ambition Scenario project group will increase overall CO2 emissions. The new interconnections between Finland, Sweden and Germany enable these countries to further cooperate avoiding demand curtailment. As all green hydrogen supply sources (both locally produced and imported) are already used at their maximum capacity, an increase in blue hydrogen (i.e. SMR) is needed to satisfy the hydrogen demand in 2040 to avoid demand curtailment.

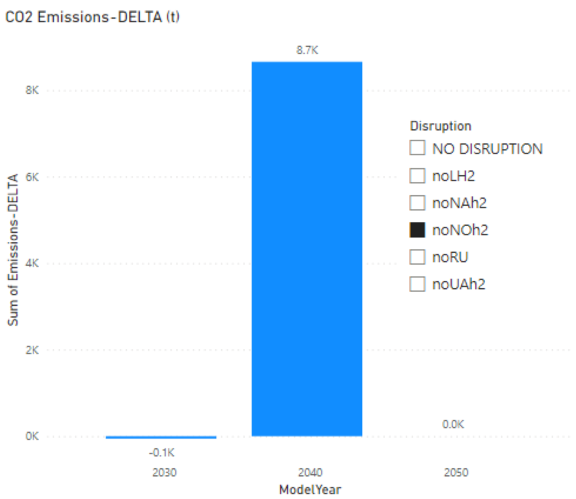


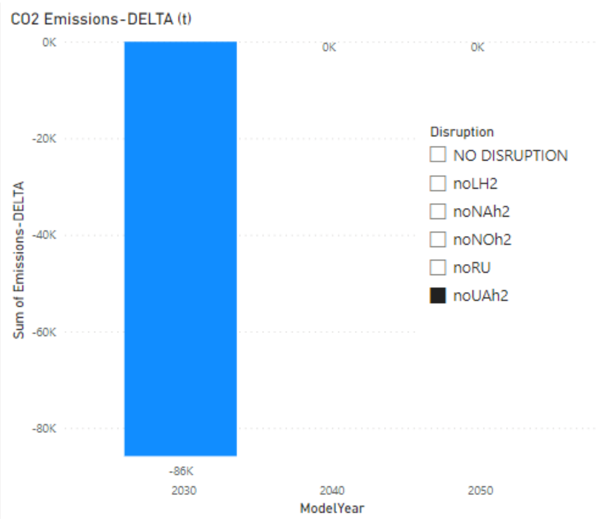


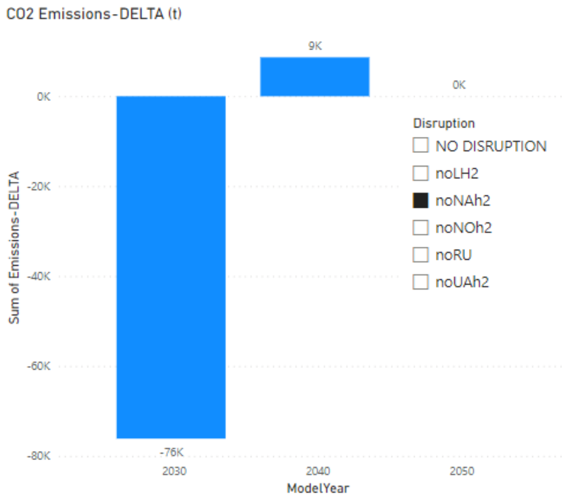
Similarly, when North African, Ukrainian or liquid hydrogen imports are disrupted, the project group also contributes to sustainability by reducing overall CO2 emissions in 2030, however, to a lower extent than in the reference case due to the lower availability of hydrogen supplies.

1 noLH2 : LH2 disruption / 2 noNOh2 : Norway disruption / 3 noUAh2 : Ukraine disruption/ 4 noNAh2 : North Africa disruption







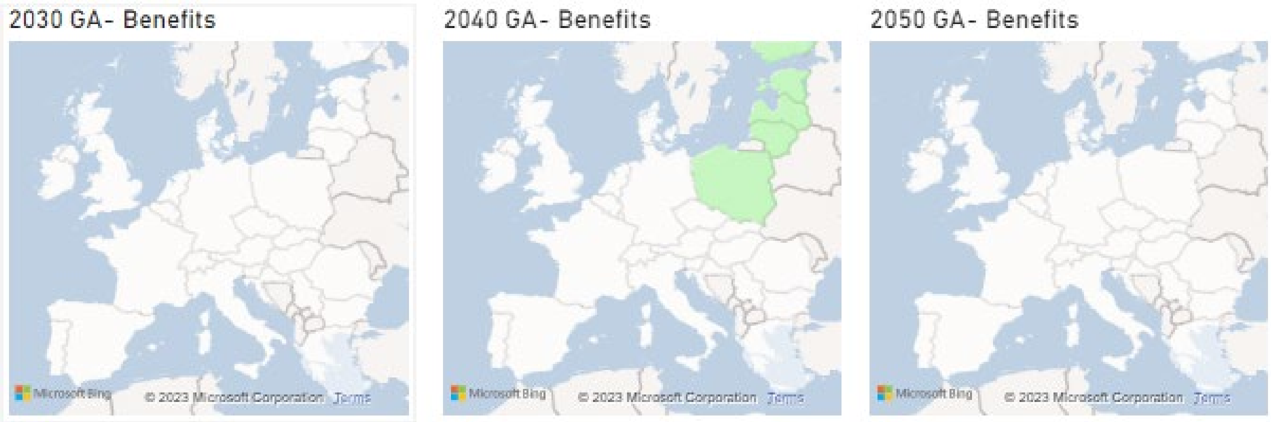


Security of supply benefits

> Reference case

With the implementation of the project group, which creates new interconnections between Finland, Sweden and Germany for both flow directions, allowing hydrogen to flow from Finland and Sweden to Germany and its neighbouring countries.

In the reference case, the project group mitigates the risk of hydrogen demand curtailment during average winter by 6% in Poland, Baltic States and Finland in 2040.

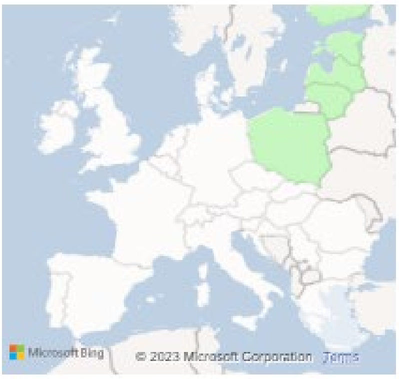


> Climatic Stress cases

In addition to the security of supply benefits described for reference case, additional security of supply benefits are expected under climatic stress cases (2-week Cold Spell, 2-week dunkelflaute and peak day), were due to the higher hydrogen demand the project group will also mitigate risk of demand curtailment in Finland, Baltic States and Poland in 2030.

2030 GA- Benefits

2040 GA- Benefits



2050 GA- Benefits

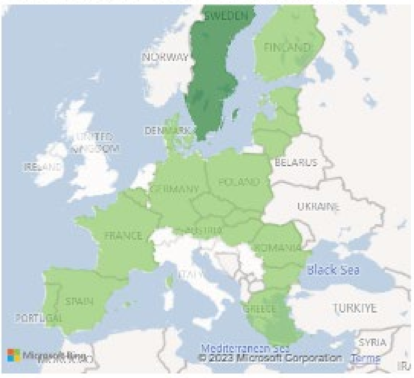
> Disruption cases (S-1)

No additional security of supply benefits were found for supply disruption cases. However, it is important to mention that the benefits of this project group could be impacted due to a related project group (BEMIP 2), located in the same geographical area connecting Sweden with Finland via an onshore route.

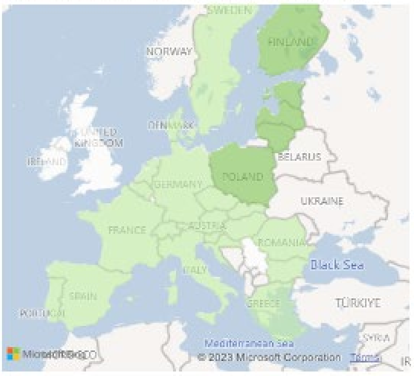
> SLCD

In case of single largest capacity disruption, the project group mitigates the risk of demand curtailment in 2030 by by 20% in Sweden, by 16% in Poland ,and by 17% in Estonia, Finland, Latvia and Lithuania, the project group is also mitigating risk of demand curtailment in most European countries, however to a lower extent (between 10-13%) . Similarly, in 2040 the project group mitigates the risk of demand curtailment by 7% in Poland, Baltic States and Finland and in 2050, the by 9% in Poland, Sweden, Finland, and Baltic states.

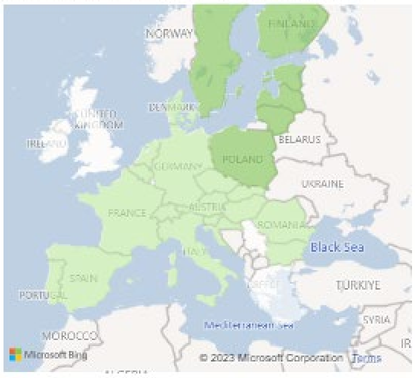
SLCD Benefits - 2030 - Global Ambition



SLCD Benefits - 2040 - Global Ambition



SLCD Benefits - 2050 - Global Ambition



C.2 Quantitative benefits [ENTSOG]

The following tables display all the benefits quantified by ENTSOG through specific security of supply and sustainability indicators.

Sustainability

ModelYear	Disruption	Scenario	Unit	Emission Delta	Emission Plus	Emission Minus
2030	NO DISRUPTION	DE	tonne	-261.941	538.677.299	538.939.240
2030	NO DISRUPTION	GA	tonne	-85.822	592.910.448	592.996.270
2030	noLH2	DE	tonne	-197.050	540.175.890	540.372.940
2030	noLH2	GA	tonne	-25.492	594.817.481	594.842.973
2030	noNAh2	DE	tonne	-218.353	539.785.356	540.003.709
2030	noNAh2	GA	tonne	-76.125	594.141.433	594.217.558
2030	noNOh2	DE	tonne	-101.363	538.877.198	538.978.561
2030	noNOh2	GA	tonne	-56	593.310.994	593.311.050
2030	noUAh2	DE	tonne	-220.272	539.378.772	539.599.044
2030	noUAh2	GA	tonne	-85.817	593.627.618	593.713.435
2040	NO DISRUPTION	DE	tonne	-2.617	392.077.044	392.079.661
2040	NO DISRUPTION	GA	tonne	50.939	396.523.252	396.472.313
2040	noLH2	DE	tonne	0	392.213.883	392.213.883
2040	noLH2	GA	tonne	0	397.455.197	397.455.197
2040	noNAh2	DE	tonne	0	392.188.098	392.188.098
2040	noNAh2	GA	tonne	8.656	397.301.977	397.293.321
2040	noNOh2	DE	tonne	0	392.144.023	392.144.023
2040	noNOh2	GA	tonne	8.656	397.450.977	397.442.321
2040	noUAh2	DE	tonne	0	392.399.183	392.399.183
2040	noUAh2	GA	tonne	0	397.478.498	397.478.498
2050	NO DISRUPTION	DE	tonne	0	232.557.735	232.557.735
2050	NO DISRUPTION	GA	tonne	0	228.306.707	228.306.707
2050	noLH2	DE	tonne	0	232.557.735	232.557.735
2050	noLH2	GA	tonne	0	228.306.707	228.306.707
2050	noNAh2	DE	tonne	0	232.557.735	232.557.735
2050	noNAh2	GA	tonne	0	228.306.707	228.306.707
2050	noNOh2	DE	tonne	0	232.557.735	232.557.735
2050	noNOh2	GA	tonne	0	228.306.707	228.306.707
2050	noRU	DE	tonne	0	232.557.735	232.557.735
2050	noRU	GA	tonne	0	228.306.707	228.306.707
2050	noUAh2	DE	tonne	0	232.557.735	232.557.735

2050	noUAh2	GA	tonne	0	228.306.707	228.306.707

Sustainability:

Curtailment Rate (SLCD):

Country	2030-DE-DELTA	2030-GA-DELTA	2040-DE-DELTA	2040-GA-DELTA	2050-DE-DELTA	2050-GA-DELTA
Estonia	-26%	-17%	-21%	-7%	-16%	-9%
Finland	-27%	-17%	-21%	-6%	-17%	-9%
Latvia	-26%	-17%	-21%	-7%	-15%	-9%
Lithuania	-25%	-17%	-21%	-7%	-15%	-8%
Sweden	-31%	-20%	-21%	-4%	-17%	-9%
Poland	-25%	-16%	-20%	-7%	-15%	-9%
Portugal	-10%	-12%	-6%	-4%	0%	-2%
Slovenia	0%	0%	-6%	-4%	-1%	-2%
Austria	-10%	-13%	-5%	-4%	-2%	-3%
Belgium	-10%	-13%	-5%	-4%	-1%	-2%
Czechia	-10%	-13%	-5%	-4%	-2%	-3%
Denmark	-10%	-13%	-5%	-4%	-1%	-2%
France	-10%	-13%	-5%	-4%	-1%	-2%
Germany	-11%	-13%	-5%	-4%	-2%	-3%
Italy	-6%	-1%	-5%	-3%	-2%	-2%
Spain	-10%	-13%	-5%	-4%	-2%	-2%
Switzerland	0%	0%	-5%	-3%	-2%	-2%
The Netherlands	0%	0%	-5%	-4%	-2%	-2%
Bulgaria	-3%	-12%	-2%	-2%	0%	-2%
Croatia	0%	0%	-2%	-2%	0%	-2%
Hungary	-3%	-12%	-2%	-2%	0%	-2%
Slovakia	-10%	-13%	-2%	-2%	0%	-2%
Greece	-3%	-12%	-2%	-3%	0%	-1%
Romania	-4%	-12%	-1%	-2%	0%	-3%

Curtailment Rate (Climatic Stress):

SimulationPeriod	Country	2030-DE-DELTA	2030-GA-DELTA	2040-DE-DELTA	2040-GA-DELTA	2050-DE-DELTA	2050-GA-DELTA
Average2W	Austria	0%	0%	0%	0%	0%	0%
Average2W	Belgium	0%	0%	0%	0%	0%	0%
Average2W	Bulgaria	0%	0%	0%	0%	0%	0%
Average2W	Croatia	0%	0%	0%	0%	0%	0%
Average2W	Cyprus	0%	0%	0%	0%	0%	0%
Average2W	Czechia	0%	0%	0%	0%	0%	0%
Average2W	Denmark	0%	0%	0%	0%	0%	0%
Average2W	Estonia	-24%	-12%	0%	-3%	0%	0%
Average2W	Finland	-24%	-12%	0%	-3%	0%	0%

Average2W	France	0%	0%	0%	0%	0%	0%
Average2W	Germany	0%	0%	0%	0%	0%	0%
Average2W	Greece	0%	0%	0%	0%	0%	0%
Average2W	Hungary	0%	0%	0%	0%	0%	0%
Average2W	Ireland	0%	0%	0%	0%	0%	0%
Average2W	Italy	0%	0%	0%	0%	0%	0%
Average2W	Latvia	-24%	-12%	0%	-3%	0%	0%
Average2W	Lithuania	-24%	-12%	0%	-3%	0%	0%
Average2W	Luxembourg	0%	0%	0%	0%	0%	0%
Average2W	Malta	0%	0%	0%	0%	0%	0%
Average2W	Poland	-24%	-11%	0%	-3%	0%	0%
Average2W	Portugal	0%	0%	0%	0%	0%	0%
Average2W	Romania	0%	0%	0%	0%	0%	0%
Average2W	Serbia	0%	0%	0%	0%	0%	0%
Average2W	Slovakia	0%	0%	0%	0%	0%	0%
Average2W	Slovenia	0%	0%	0%	0%	0%	0%
Average2W	Spain	0%	0%	0%	0%	0%	0%
Average2W	Sweden	-24%	-13%	0%	-3%	0%	0%
Average2W	Switzerland	0%	0%	0%	0%	0%	0%
Average2W	The Netherlands	0%	0%	0%	0%	0%	0%
Average2W	United Kingdom	0%	0%	0%	0%	0%	0%
Average2WDF	Austria	0%	0%	0%	0%	0%	0%
Average2WDF	Belgium	0%	0%	0%	0%	0%	0%
Average2WDF	Bulgaria	0%	0%	0%	0%	0%	0%
Average2WDF	Croatia	0%	0%	0%	0%	0%	0%
Average2WDF	Cyprus	0%	0%	0%	0%	0%	0%
Average2WDF	Czechia	0%	0%	0%	0%	0%	0%
Average2WDF	Denmark	0%	0%	0%	0%	0%	-1%
Average2WDF	Estonia	-24%	-12%	0%	-2%	0%	0%
Average2WDF	Finland	-24%	-12%	0%	-3%	0%	0%
Average2WDF	France	0%	0%	0%	0%	0%	0%
Average2WDF	Germany	0%	0%	0%	0%	0%	0%
Average2WDF	Greece	0%	0%	0%	0%	0%	0%
Average2WDF	Hungary	0%	0%	0%	0%	0%	0%
Average2WDF	Ireland	0%	0%	0%	0%	0%	0%
Average2WDF	Italy	0%	0%	0%	0%	0%	0%
Average2WDF	Latvia	-24%	-12%	0%	-2%	0%	0%
Average2WDF	Lithuania	-24%	-12%	0%	-2%	0%	0%
Average2WDF	Luxembourg	0%	0%	0%	0%	0%	0%
Average2WDF	Malta	0%	0%	0%	0%	0%	0%
Average2WDF	Poland	-24%	-11%	0%	-2%	0%	0%
Average2WDF	Portugal	0%	0%	0%	0%	0%	0%
Average2WDF	Romania	0%	0%	0%	0%	0%	0%
Average2WDF	Serbia	0%	0%	0%	0%	0%	0%
Average2WDF	Slovakia	0%	0%	0%	0%	0%	0%
Average2WDF	Slovenia	0%	0%	0%	0%	0%	0%
Average2WDF	Spain	0%	0%	0%	0%	0%	0%

Average2WDF	Sweden	-24%	-13%	0%	-3%	0%	0%
Average2WDF	Switzerland	0%	0%	0%	0%	0%	-1%
Average2WDF	The Netherlands	0%	0%	0%	0%	0%	0%
Average2WDF	United Kingdom	0%	0%	0%	0%	0%	0%
DC	Austria	0%	0%	0%	0%	0%	0%
DC	Belgium	0%	0%	0%	0%	0%	0%
DC	Bulgaria	0%	0%	0%	0%	0%	0%
DC	Croatia	0%	0%	0%	0%	0%	0%
DC	Cyprus	0%	0%	0%	0%	0%	0%
DC	Czechia	0%	0%	0%	0%	0%	0%
DC	Denmark	0%	0%	0%	0%	0%	0%
DC	Estonia	-22%	-14%	0%	-3%	0%	0%
DC	Finland	-23%	-14%	0%	-3%	0%	0%
DC	France	0%	0%	-1%	0%	0%	0%
DC	Germany	0%	0%	0%	0%	0%	0%
DC	Greece	0%	0%	0%	0%	0%	0%
DC	Hungary	0%	0%	0%	0%	0%	0%
DC	Ireland	0%	0%	0%	0%	0%	0%
DC	Italy	0%	0%	0%	0%	0%	0%
DC	Latvia	-22%	-14%	0%	-3%	0%	0%
DC	Lithuania	-22%	-14%	0%	-3%	0%	0%
DC	Luxembourg	0%	0%	0%	0%	0%	0%
DC	Malta	0%	0%	0%	0%	0%	0%
DC	Poland	-22%	-14%	0%	-3%	0%	0%
DC	Portugal	0%	0%	0%	0%	0%	0%
DC	Romania	0%	0%	0%	0%	0%	0%
DC	Serbia	0%	0%	0%	0%	0%	0%
DC	Slovakia	0%	0%	0%	0%	0%	0%
DC	Slovenia	0%	0%	0%	0%	0%	-1%
DC	Spain	0%	0%	0%	0%	0%	0%
DC	Sweden	-23%	-14%	0%	-3%	0%	0%
DC	Switzerland	0%	0%	0%	0%	-1%	0%
DC	The Netherlands	0%	0%	0%	0%	0%	0%
DC	United Kingdom	0%	0%	0%	0%	0%	0%

D. Environmental Impact [Promoter]

Any gas infrastructure has an impact on its surroundings. This impact is of particular relevance when crossing some environmentally sensitive areas. Mitigation measures are taken by the promoters to reduce this impact and comply with the EU and National regulations.

TYNDP Code	Type of infrastructure	Surface of impact	Environmentally sensitive area
HYD-N-1355	N/A	N/A	N/A
HYD-N-926	N/A	N/A	N/A

Potential impact	Mitigation measures	Related costs included in project CAPEX and OPEX	Additional expected costs
HYD-N-1355	N/A	N/A	N/A
HYD-N-926	N/A	N/A	N/A

Environmental Impact explained [Promoter]

The BHC pipeline use best practices to prioritize safety and reliability in the design and building phases. In the design phase, we will determine the CO_2 footprint of the pipeline and related infrastructure. The environmental impacts will occur mostly during the construction phase. The operational phase will have relatively small environmental impacts. Production of the pipe and equipment, transportation, and construction will emit an estimated 10 million tCO_2e. However, these emissions could be significantly reduced using green steel for manufacturing the pipeline as and when such steel becomes commercially available. Throughout construction, the BHC will ensure high environmental standards and endeavour to enhance biodiversity.

E. Other benefits [Promoter]

Missing benefits are all benefits of a project which may be not captured by ENTSOG analysis.

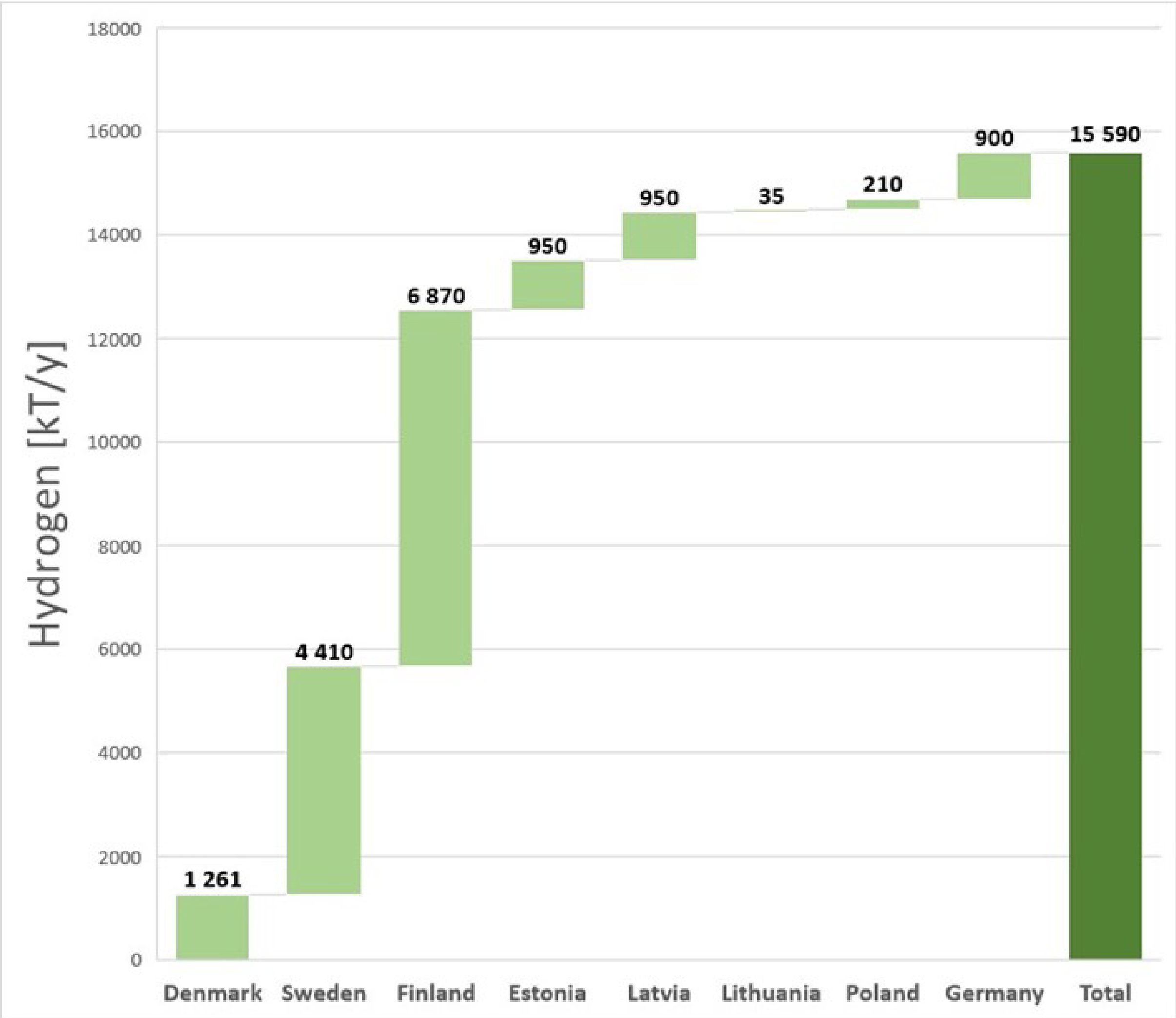
As a necessary condition a missing benefit cannot have discrepancies with the benefits already covered by the assessment run by ENTSOG and this condition needs to be proved and justified.

Description of Other benefits [Promoter]

New industry is forming in the region. This will be replacing the CO2 emissions. This demand is not yet existing in the current CO2 emissions and Fossil-based production (steel, fuels). Indirect CO2 emission reduction in multiple sectors will be enabled by replacing fossil-based products with clean hydrogen based production (fertilizers, fuels etc.) which improves the sustainability.

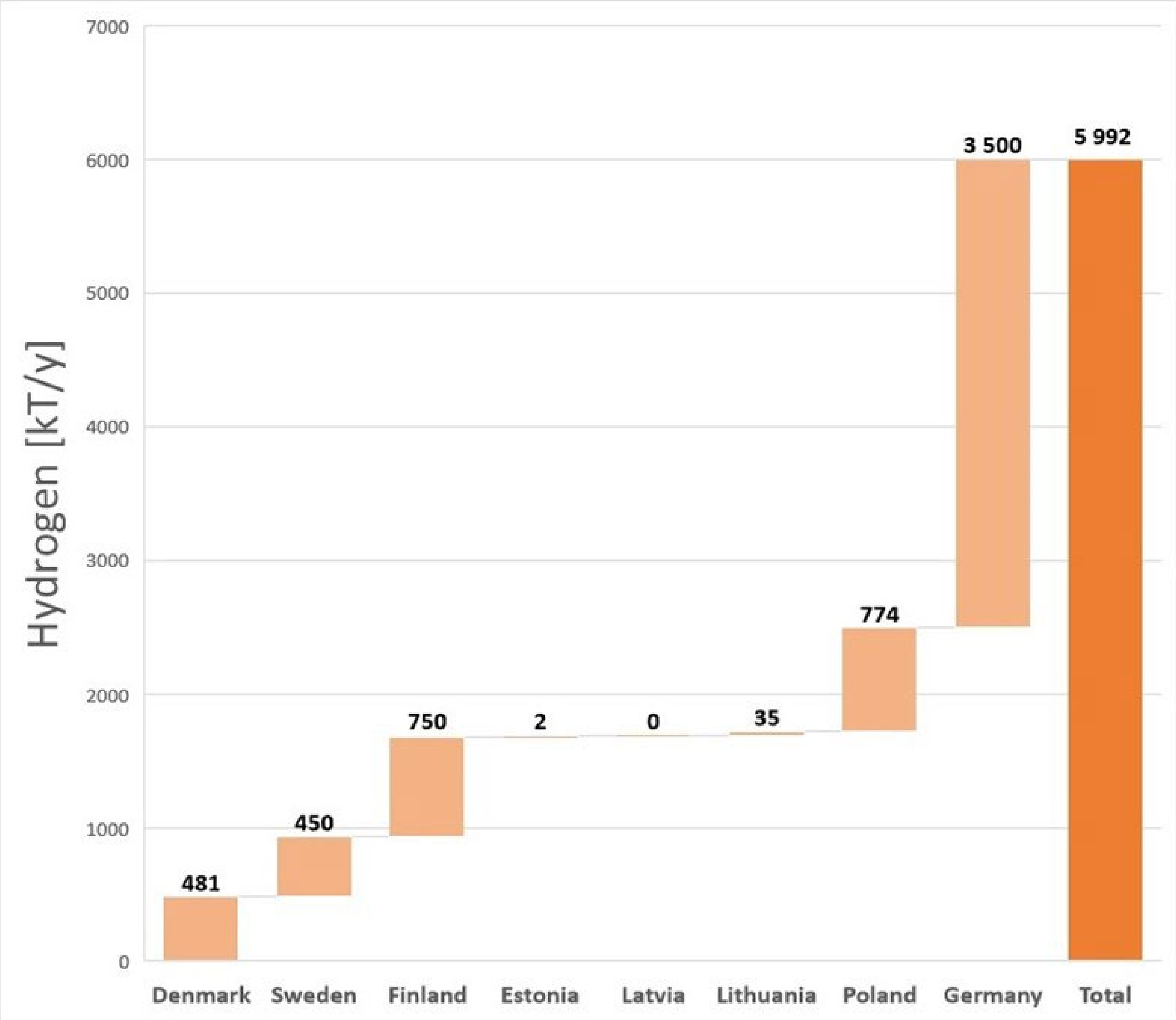
Hydrogen Demand and Supply potential around the Baltic Sea region can be seen from the pictures below.

Projected hydrogen production potential(2) (kt/year)



(2) For Denmark, Sweden, Finland and Estonia hydrogen production potential is based on the onshore and offshore wind potentials shown on the map.
For Lithuania, Poland and Germany the potential is based on the Member State data for 2030 provided during the March 2023.

Hydrogen demand around the Baltic Sea region[1] by 2030 (kt/year)



(1) For Poland the current demand based on the Member State data provided during the March 2023 is assumed to be decarbonized by 2030.
For other countries the Member State data for 2030 demand is used (provided during the March 2023).

F. Useful links [Promoter]

Useful links:

https://balticseahydrogencollector.com/

https://gasgrid.fi/en/2022/12/16/major-milestone-in-transforming-european-energy-market-gas-transmission-system-operators-and-leading-renewable-energy-developers-investigate-possibility-to-develop-offshore-hydrogen-infrastructure-a/

https://www.ox2.com/newsroom/news/2022/ox2-to-investigate-the-possibility-to-develop-offshore-hydrogen-pipeline-in-the-baltic-sea/