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BALTIC GRID

Reshaping Natural Gas Transmission for H_2 Integration

Dr. Aleksejs Batrakovs

«The past is behind, learn from it. The future is ahead, prepare for it. The present is here, live it.» - Thomas S. Monson

The Past

The Future

The Present

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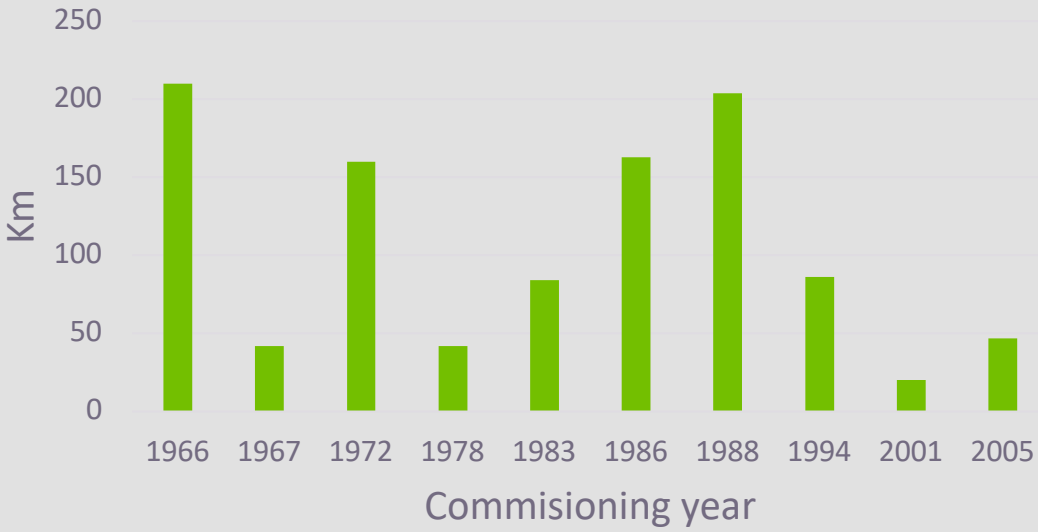
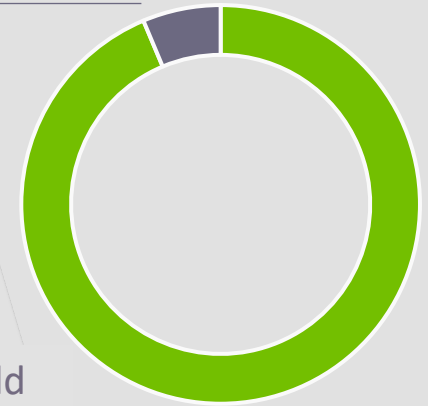
The Past

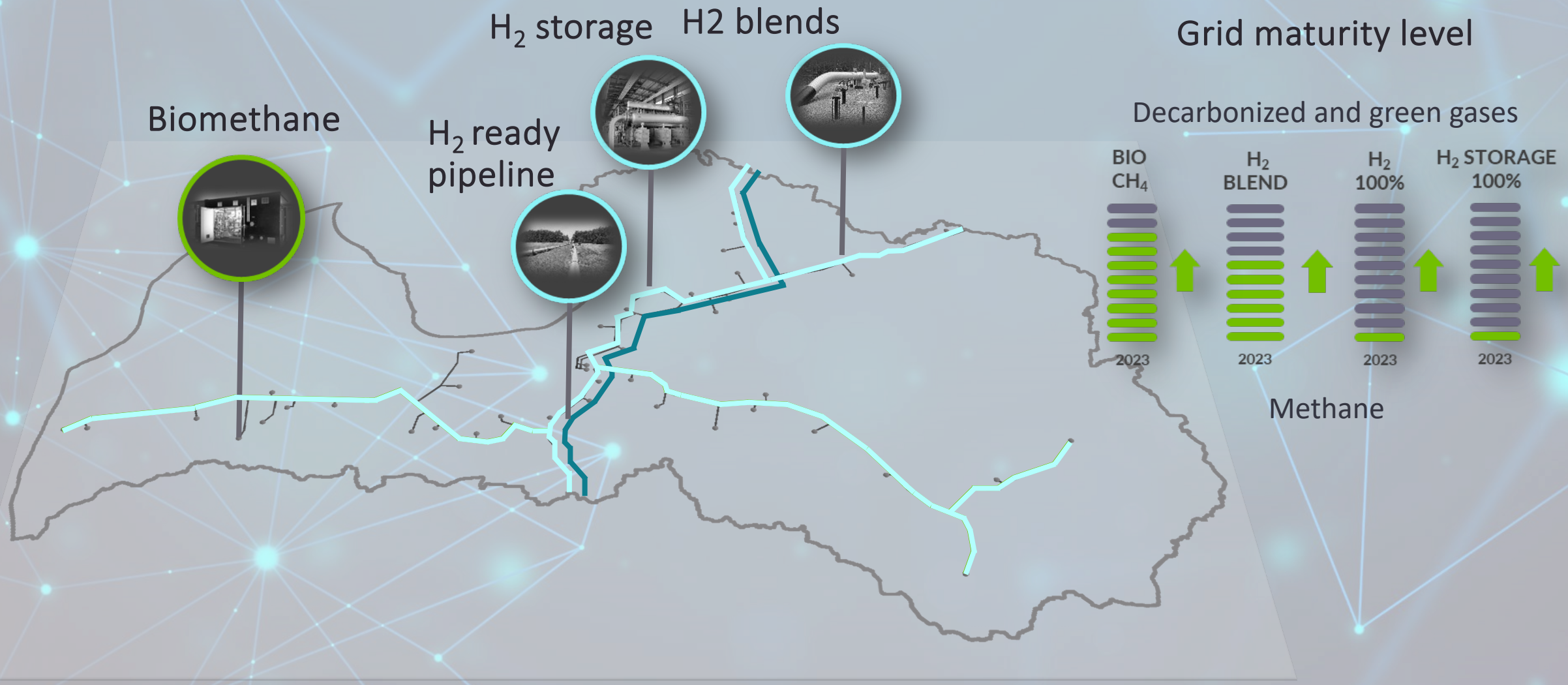


6% of ≤ 30 years old

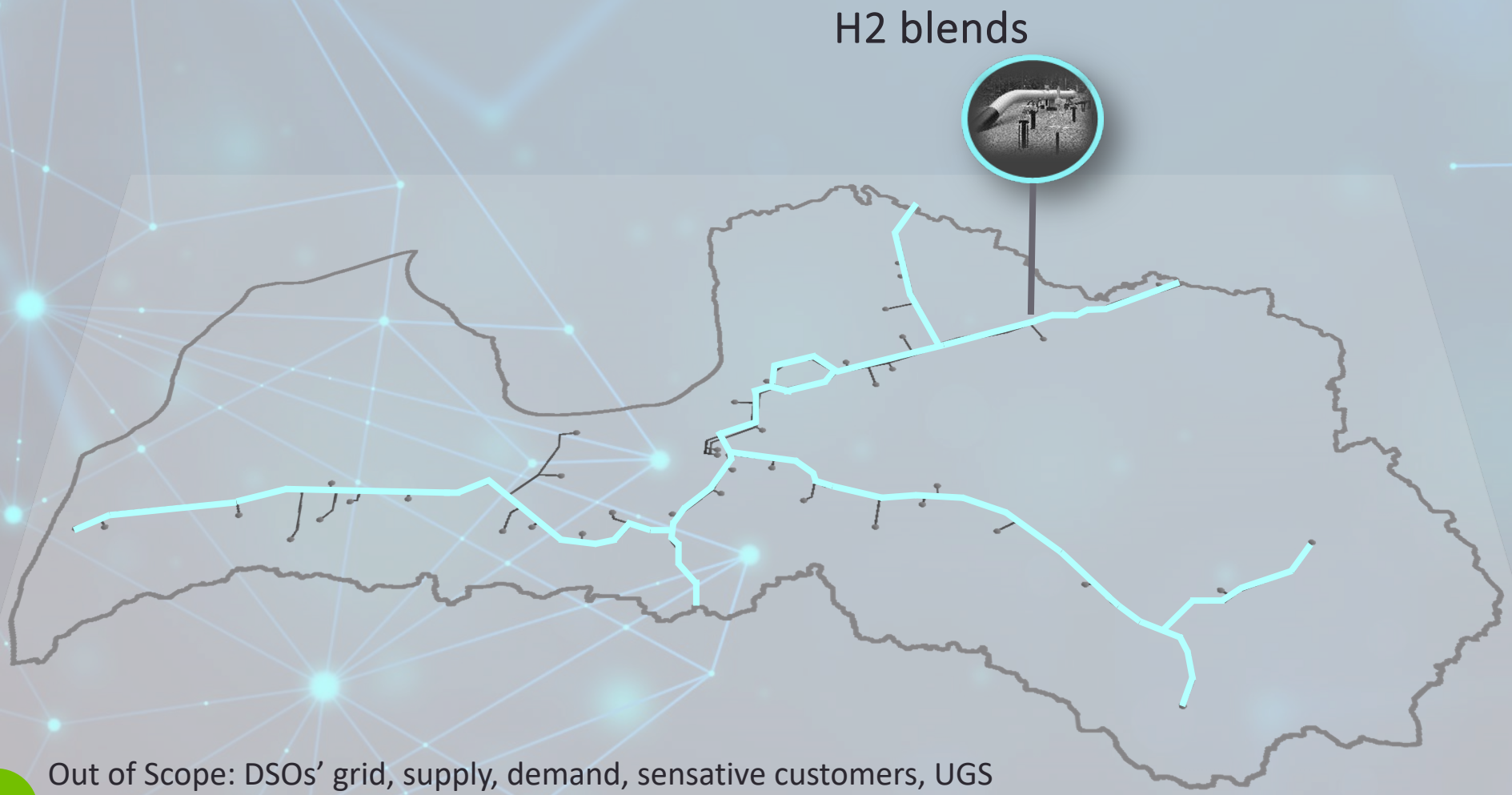


94% of pipelines are 57 – 30 years old

The current system and and its future trajectory in the coming years



H_2 Blending R&D project



Out of Scope: DSOs' grid, supply, demand, sensative customers, UGS

H_2 Blending R&D project

2025
EU plan 2-5% cap for H2 blend at IP

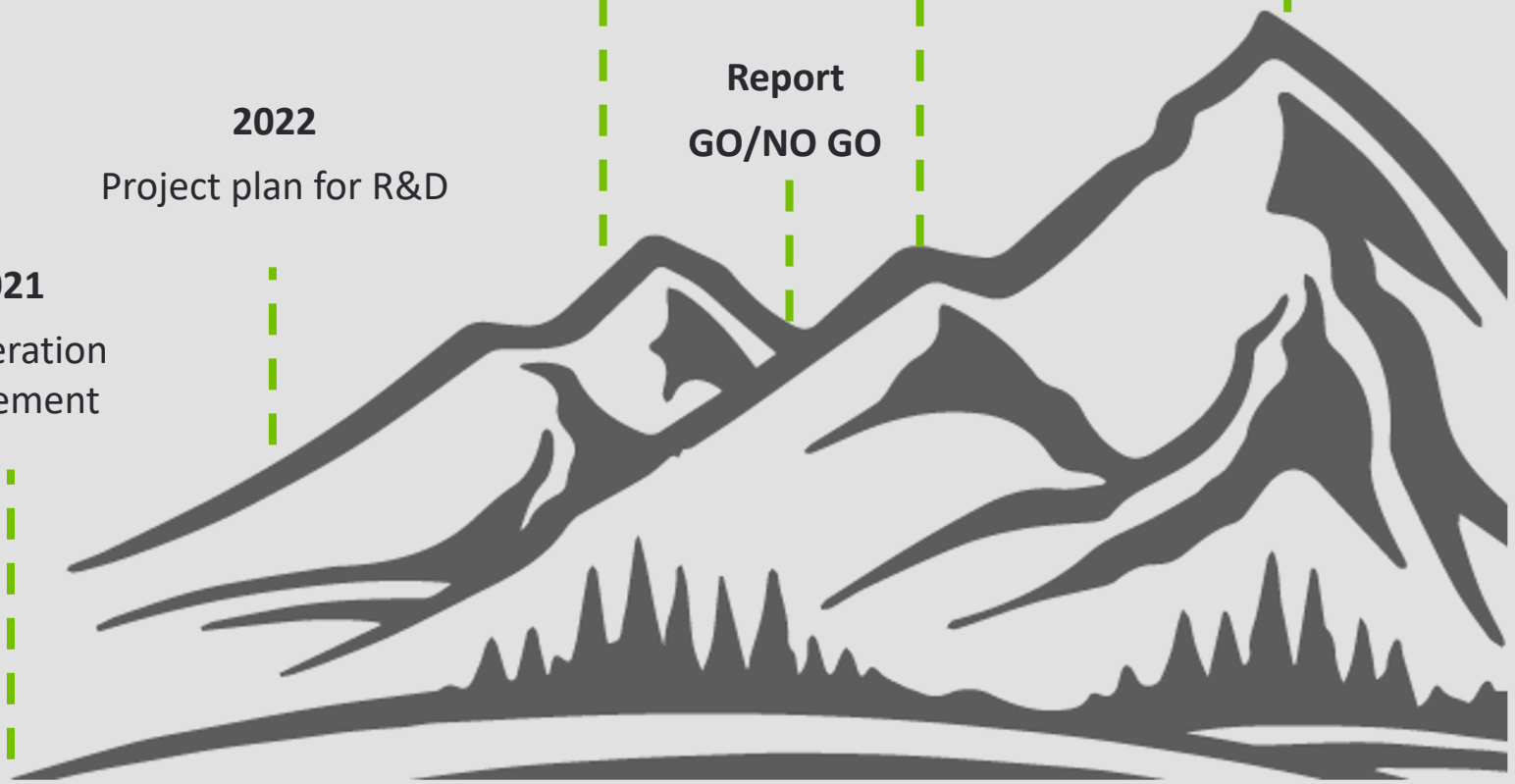
2024/2025
Preparation works for the blending

2023
desktop study

Report
GO/NO GO

2022
Project plan for R&D

2021
Cooperation agreement



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Assessing the equipment's compatibility with hydrogen blends of 2%, 5%, 10%, and 20% mixed with natural gas. CAPEX and OPEX

Key findings from the prefeasibility study

Transportation volume

Hydrogen has a lower energy density than natural gas: at the same pressure, a cubic meter of hydrogen only contains 1/3 of the energy of a cubic meter of natural gas. **Blending has impact on gas transportation volume**

Transportation time

The volume flow of hydrogen can be higher than for natural gas, bringing the maximum **energy capacity of a hydrogen pipeline to a value of up to 80% of the energy capacity it has when transporting natural gas**

Compression

The results show that when transporting gas with an admixture of hydrogen or even pure hydrogen, **more compressor work is required.**
20% blend requires ~ 22% more power

Hydrogen seasonal storage in Latvia – feasible, or not ?

Pre-feasibility study and project plan for R&D

- The study is expected to be completed by the end of 2023;
- Initial conclusions;
- R&D plan; PCI documentation;
- Financial assessment and evaluation framework;

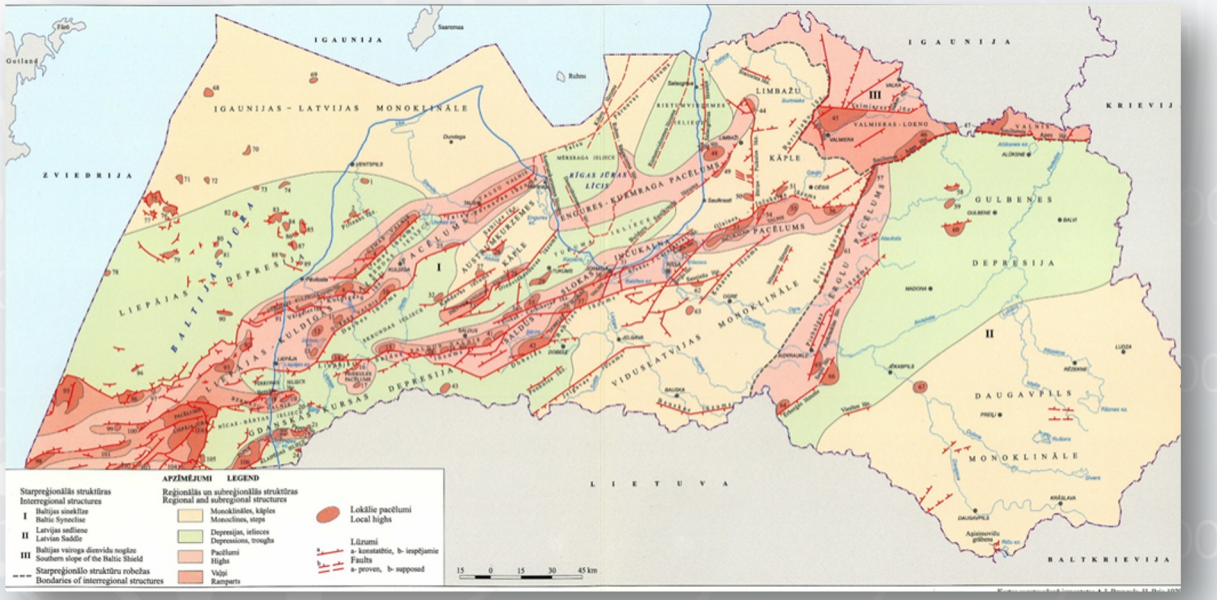
The 100% H2 UGS projects were found to be ineligible due to their incompatibility with the TEN-E Regulation

The steps to be taken and the continuation of research and development

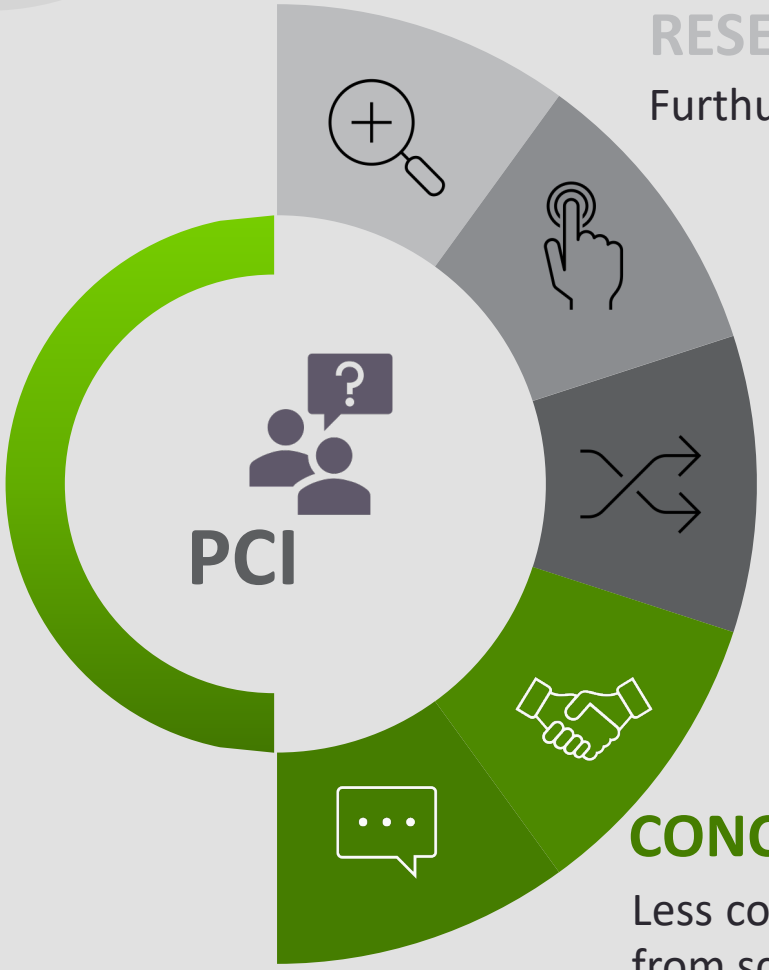
- Continuation of the Pre-feasibility study and preparation of the R&D plan for two scenarios:

A) H2 blending up to 10% in Inčukalns UGS

B) 100% H2 storage in Latvia



Key findings from the prefeasibility study



RESERVOIR

Furthure investigations and aboratory testing are needed

SURFACE EQUIPMENT

The impact is to be limited up to 10% hydrogen. R&D is needed

10% UP TO 100%

The major part of the equipment will have to be dismantled and replaced by H2 equipment

EQUIPMENT LOCATION

It may not be possible to install the new equipment for H2 at the same (ATEX zone)

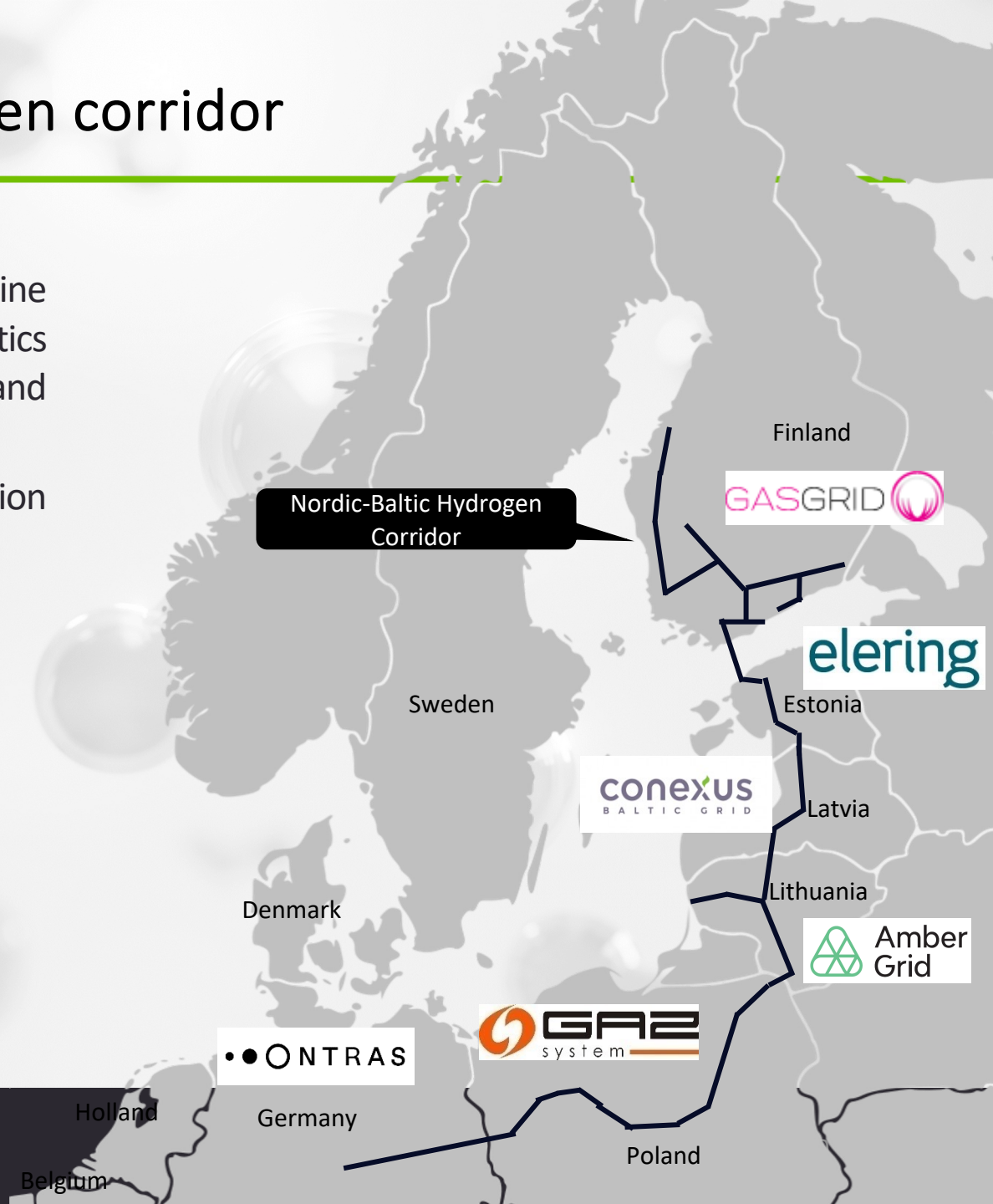
CONCLUSION

Less costly and would take less time to build a new storage site from scratch rather than convert the existing NG storage

H2 ready pipeline. Nordic-Baltic hydrogen corridor

What is the Nordic-Baltic Hydrogen Corridor?

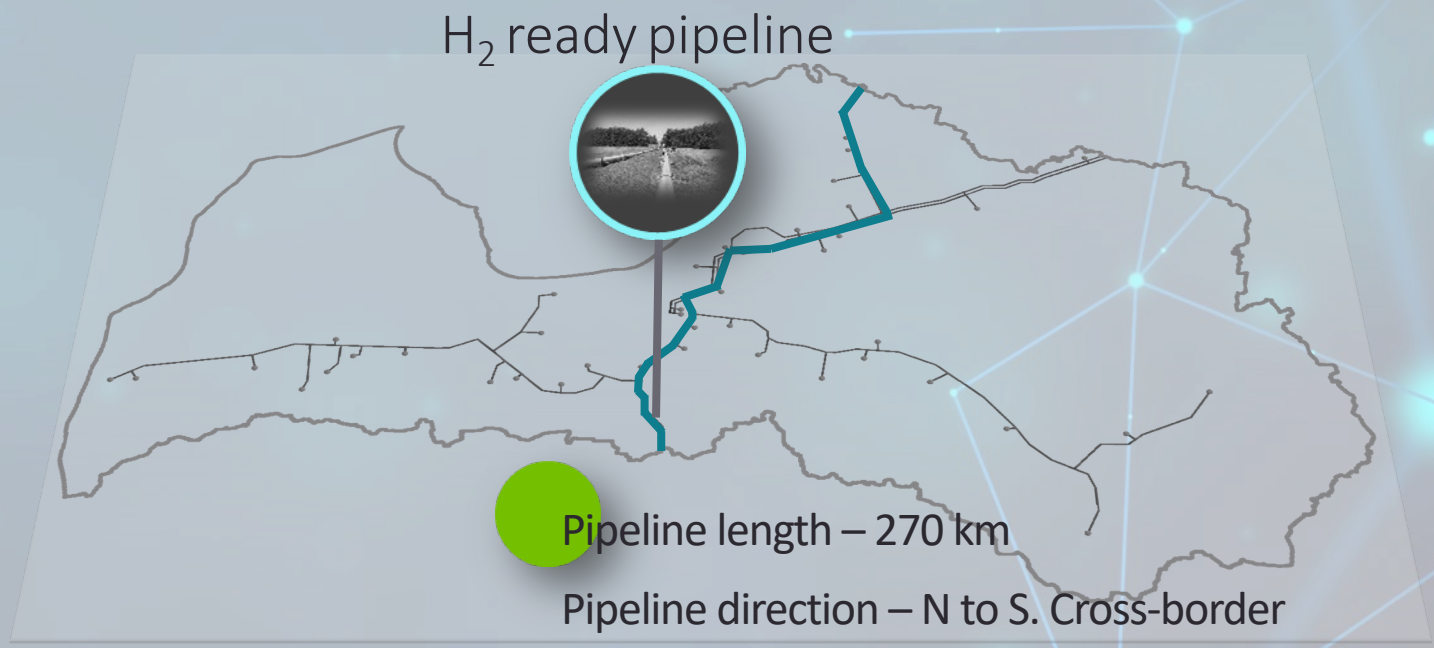
- Bi-directional, cross-border dedicated hydrogen pipeline infrastructure project from Finland to Germany through the Baltics and Poland enabling connection of regional supply, demand and storage along the infrastructure.
- Joint hydrogen infrastructure project initiative by 6 gas transmission system operators (TSOs):
  - ✓ Gasgrid Finland Oy (FI),
  - ✓ Elering AS (EE),
  - ✓ Conexus Baltic Grid, JSC (LV),
  - ✓ AB Amber Grid (LT),
  - ✓ Operator Gazociągów Przesyłowych GAZ-SYSTEM S.A. (PL),
  - ✓ ONTRAS Gastransport GmbH (DE)
- Corridor length: 3220 km



H2 ready pipeline

Nordic-Baltic hydrogen corridor
Project timeline

Nordic-Baltic hydrogen corridor
LV section



Pipeline length – 270 km

Pipeline direction – N to S. Cross-border

Routing – existing corridor or new location

CAPEX based on EHB methodology – 432 MEUR

Submitted to PCI list. Passed the assessment

Conclusions

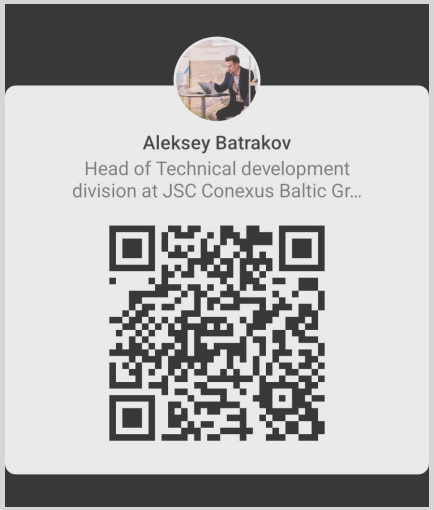
«The future is ahead, prepare for it»

- 3 studies are ongoing. Covering Conexus system for transition on H2
- System will be ready for the EU target on blending without significant investments
- NB H2 Corridor project probably accepted in PCI list
- H2 storage project requires corrections.
  2 main scenarious: up to 10% H2 blending and 100% H2 storage in new location

«The present is here, live it»

- The green transition requires substantial investments and substantial amounts of green energy.
  We are currently in the initial stages of this transition. It will take a lot of time and investments
- This is not a single-player game; it is a team game. All stakeholders, including TSO, DSO, MARKET, and NRA, must be actively involved in this journey. Without a strong team, there will be no success

Thank you for your attention



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