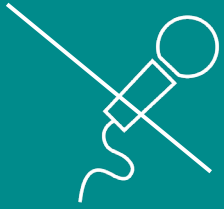




DANISH BACKBONE WEST

WEBINAR 18 September 2023





PLEASE MUTE YOUR
MICROPHONE



BREAKS FOR QUESTIONS
ARE INCLUDED



USE THE CHAT FOR
QUESTIONS AND
COMMENTS



THE WEBINAR IS NOT
BEING RECORDED



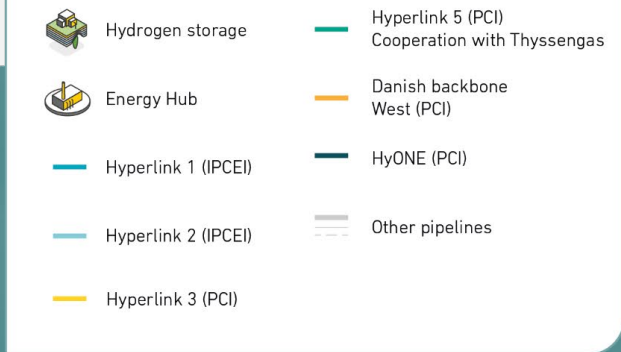
THE PRESENTATION WILL
BE SENT OUT
AFTERWARDS



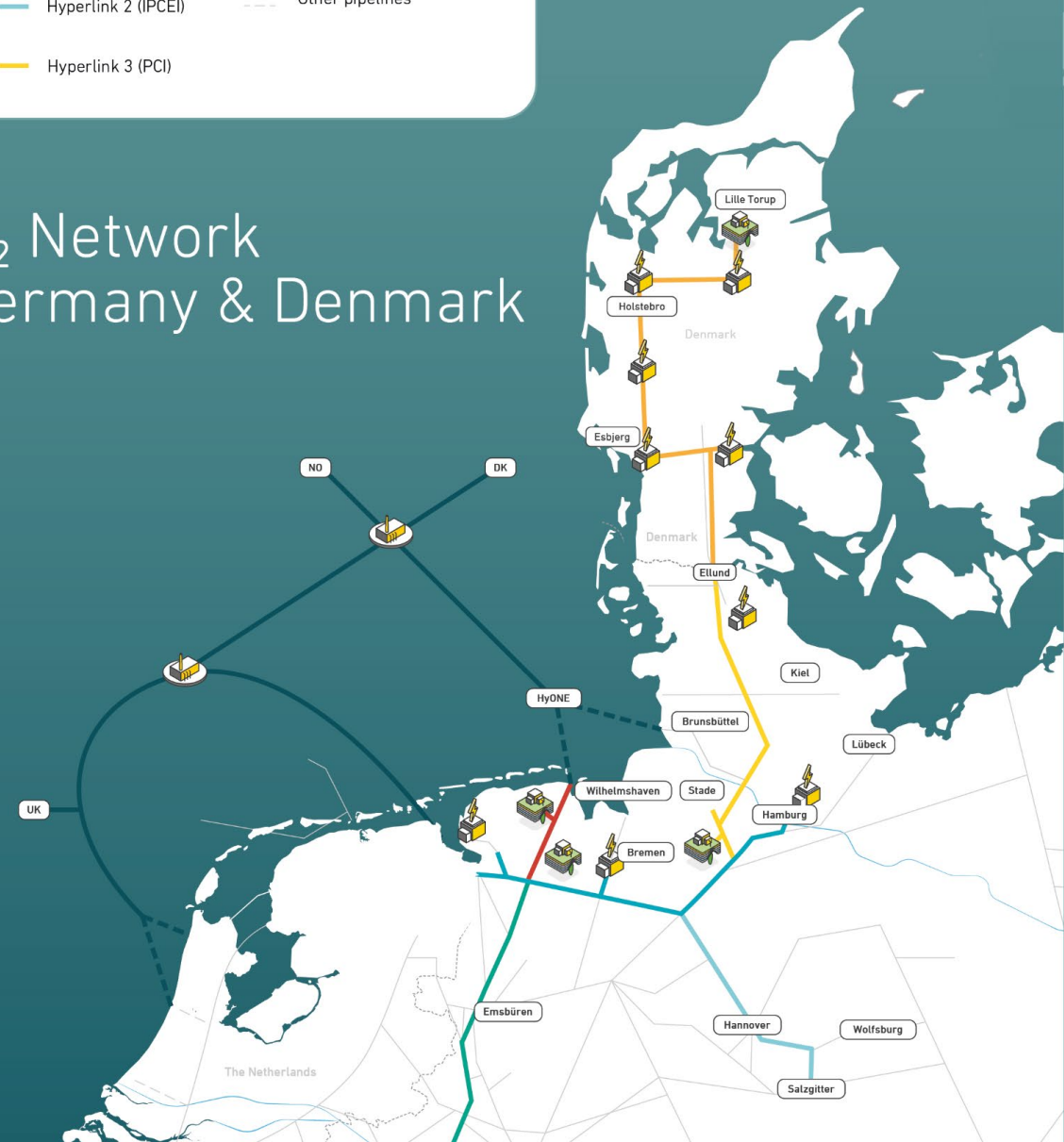
IT IS OK NOT TO
TURN ON THE
CAMERA

PROGRAMME TODAY

- The **maturation** project
- **Market** activities
- Hydrogen **storage**
- Update on **German** hydrogen **activities**
- **Next** steps



H₂ Network Germany & Denmark



REGULATORY FRAMEWORK BEING DEVELOPED IN PARALLEL

Until now..

- PtX Agreement (March 2022)
- Joint declaration: Hydrogen connection DK-DE (March 2023)
- Split of roles between Energinet and Evida (May 2023)
- Maturation project application approved (June 2023)
- Reorganisation in Energinet (August 2023)

Looking forward..

- Implementation of roles with DEA and Evida (ongoing)
- Financing of hydrogen infrastructure (Q3/Q4)
- Developments in Germany and the EU



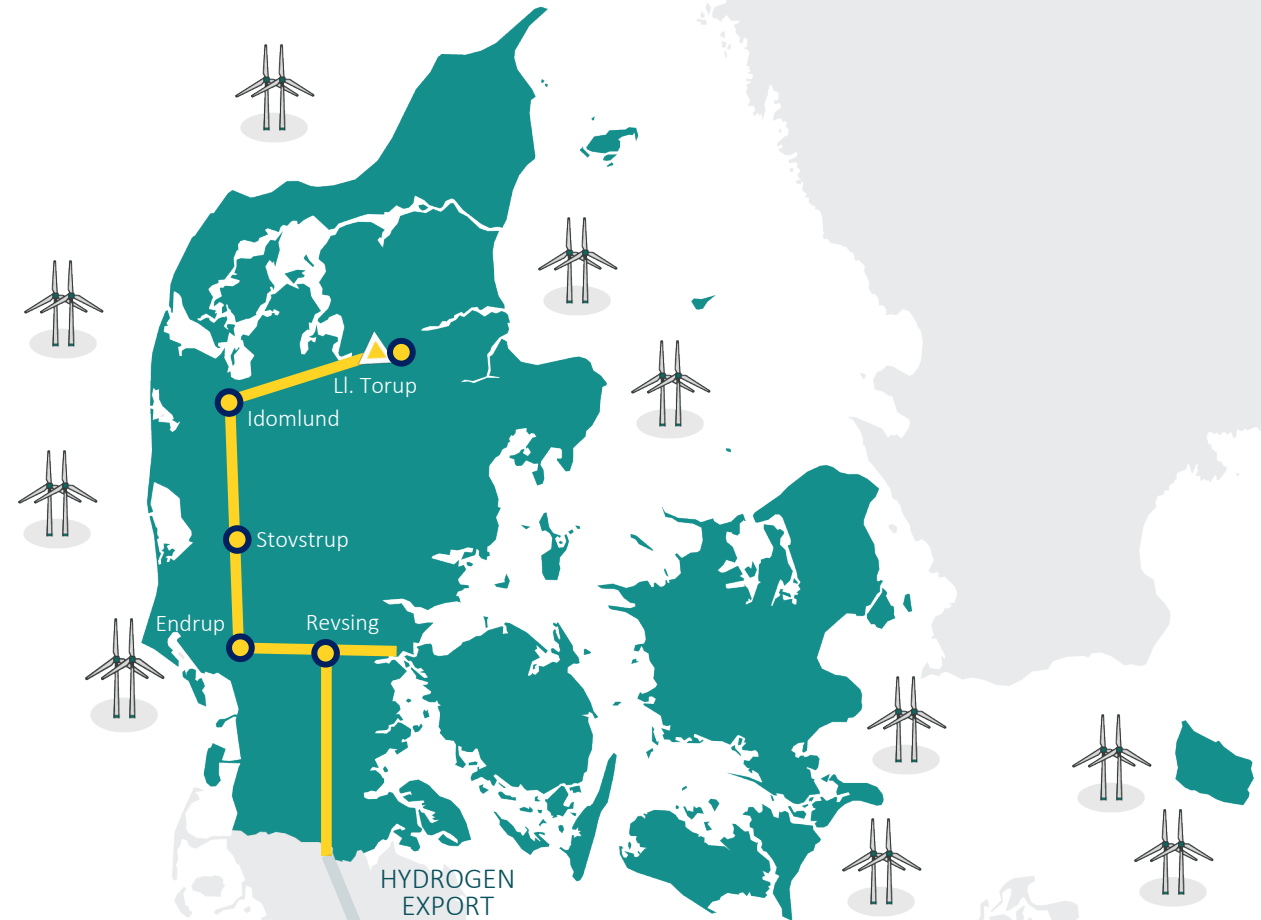
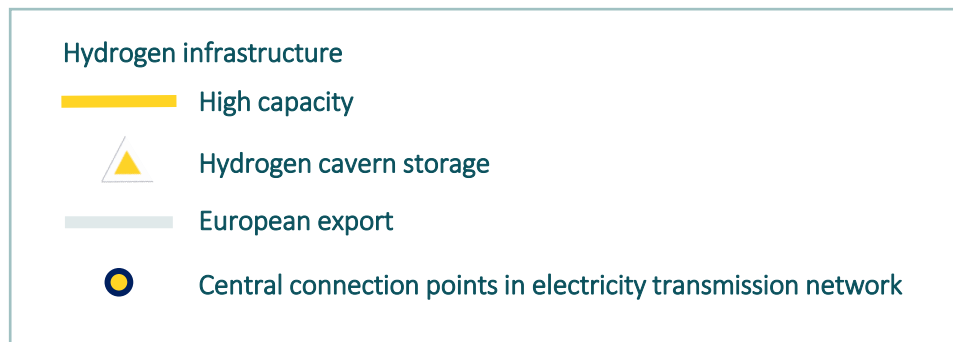


MATURATION PROJECT

Danish Backbone West

DANISH BACKBONE WEST

A possible hydrogen backbone in Jutland connecting producers, consumers, export and storage..



PROJECT TIMELINE

2022-2023

2023-2024

2025-
2028/2030



DANISH HYDROGEN
BACKBONE

PROJECT FEASIBILITY

Design solutions
Cost and time estimates
Market tests



PROJECT MATURATION

Engineering design
Pre-work EIA process
Market rules

Capacity contracts
Business case
FID \$4



PROJECT ESTABLISHMENT

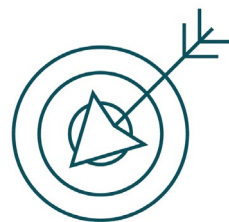
Pipeline construction
Storage construction



REQUIREMENTS FOR TRANSITION TO MATURATION

REQUIREMENTS FOR TRANSITION TO ESTABLISHMENT

PURPOSE AND GOAL



Purpose and goal

The purpose of the maturation project is to assess solutions and make a recommendation for a hydrogen backbone with the aim to potentially make an investment decision.

It is based on a positive outcome of the feasibility study finalized in spring 2023.

The maturation project includes a socio-economic business case, maturation of design for hydrogen infrastructure and getting commitment from future users of the system.

The project will also recommend a market model, an operating model and a business model for a Danish hydrogen system.



Cooperation

The project will work closely in cooperation with Gasunie Deutschland, who in parallel is working on the Hyperlink in Northern Germany, where Hyperlink3 will connect to a Danish Hydrogen infrastructure.

The project will be coordinated with Evida in relation to their projects. Internal the project coordinate with Gas Storage Denmark (GSD) with respect to hydrogen storage.

The aim is to conclude the maturation project and potentially reach an investment decision by Q2024.

KEY DELIVERABLES

- System analysis and socioeconomic analysis
- Hydrogen transportation market model
- User commitment
- Business model and financing plan
- Operating philosophy and IT-plan
- Technical design of a hydrogen backbone system, compression and pipeline corridor
- Preparation of Environmental Impact Assessment (EIA) process
- Sourcing and construction strategy
- Timeline for construction phase
- Risk analysis and risk mitigations
- Business case and decision paper



MATURATION PROJECT TIMELINE 2023-24



External
Involvement users

YOUR INVOLVEMENT

Dialogue and interaction between system provider and system users

Dialogue and interaction between system provider and system users is important at this stage to allow for:

- Successful **planning and preparation** and
- Subsequent successful **implementation and operation** so we **design and build the right system for all of us**.

That applies:

- **Shorter term:** for the maturation and execution phase
- **Long term:** for the operational phase

We would like to focus on topics in relation to:

- Market framework and commitment towards the use of a hydrogen transportation system
- The operational frame for use of a hydrogen transportation system
 - What are the considerations for the system users and for the system operator?
 - How do we think, this system could be operated?
- Workshops planned in Q4 2023 – Q1 2024
- More workshops expected in 2024

Also, this is an opportunity to learn from each other and to increase our common knowledge level

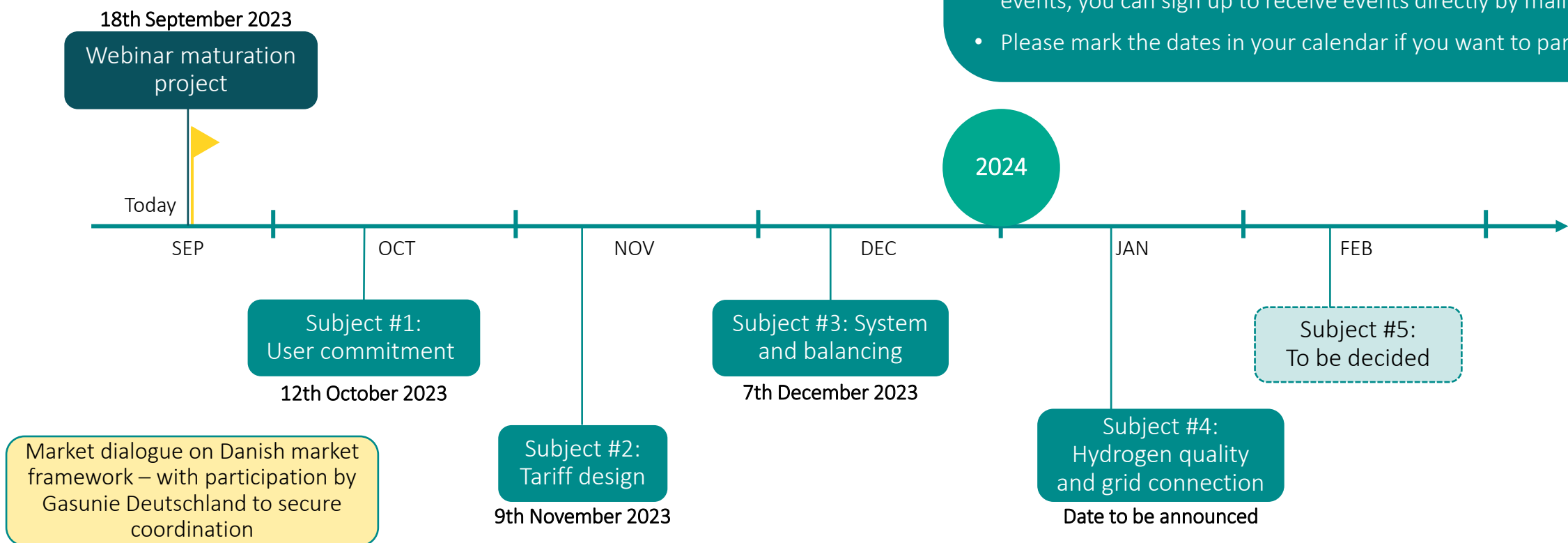


MARKET

DANISH USER/MARKET DIALOGUE

On user commitment and market framework.

- Workshops for coming users of the hydrogen infrastructure.
- Four different subjects related to user commitment and market framework is currently planned. More topics will follow.
- Sign up for the first event on user commitment on 12 October 2023 via link on the following slide.
- The following events will be published via our homepage: Frontpage\More\About us\Events\name of event. At the page for events, you can sign up to receive events directly by mail.
- Please mark the dates in your calendar if you want to participate!



HYDROGEN INFRASTRUCTURE - USER COMMITMENTS

Energinet must demonstrate a long-term demand for hydrogen infrastructure

The demand must be based on concrete market signals from future users

Political agreement on hydrogen sets the scene (freely translated)

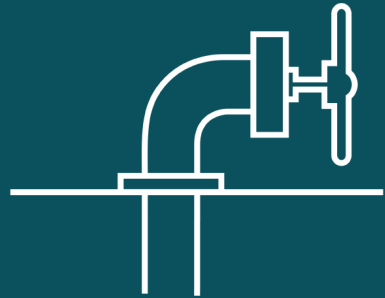
- Hydrogen infrastructure must be constructed on market terms, on the basis of a **plausible and concrete demand**, together with the long-term development plans for the relevant company, which can be based on the Energy Agency's analysis assumptions (Analyseforudsætninger).
- The approval of hydrogen infrastructure will partly be based on if the infrastructure company can prove a **concrete demand from future users of the system**, who must demonstrate a **long-term need and willingness to pay**.
- **Energinet also needs market signals**, both as input for the business case, but also as input for planning the future hydrogen infrastructure

USER COMMITMENT – MARKET INVOLVEMENT

Energinet will involve market participants to discuss how to best secure user commitment
- and at which level

User commitment – next step

- As part of the market involvement during the coming fall, the first meeting on Thursday 12 October 2023 will be on user commitment.
- Here Energinet would like to discuss with market participants means to live up to the political agreement, thereby collecting sufficient market signals to support FID for hydrogen infrastructure.
- The meeting will include group discussions, so active participation is expected.
- To sign up for this event, please go to: <https://en.energinet.dk/about-us/events/hydrogen-user-commitment-121023/>



GAS STORAGE DENMARK

H2-STORAGE

What is the ambition of GSD

Deliver H2-storage according to market need

What will GSD deliver

Short, medium and long term storage products

Energy system resilience

Security for supply and demand

When will GSD deliver

Together with ClusterNorthH2 GSD work towards delivering the first cavern in 2027

As Danish Back Bone West evolves GSD plan to make two more caverns available in 2028 and 2030

How will we interact with the market

Dialogue with market and transporters through bilateral and common meetings

Call for interest / Open season is being investigated



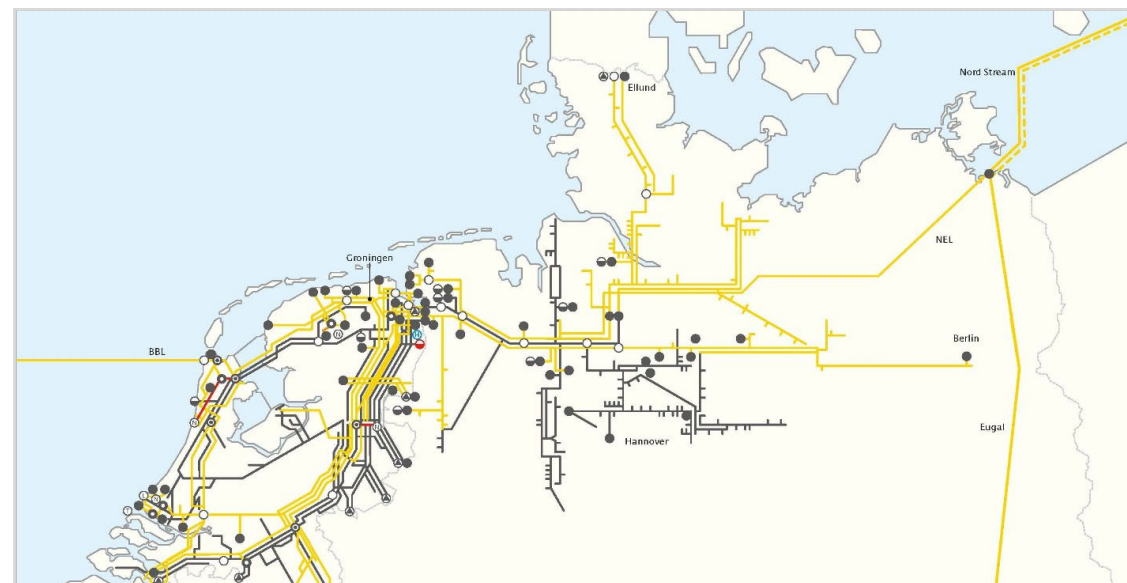
Hyperlink 3 – the Project from Gasunie

18. September 2023,
Webinar by Energinet

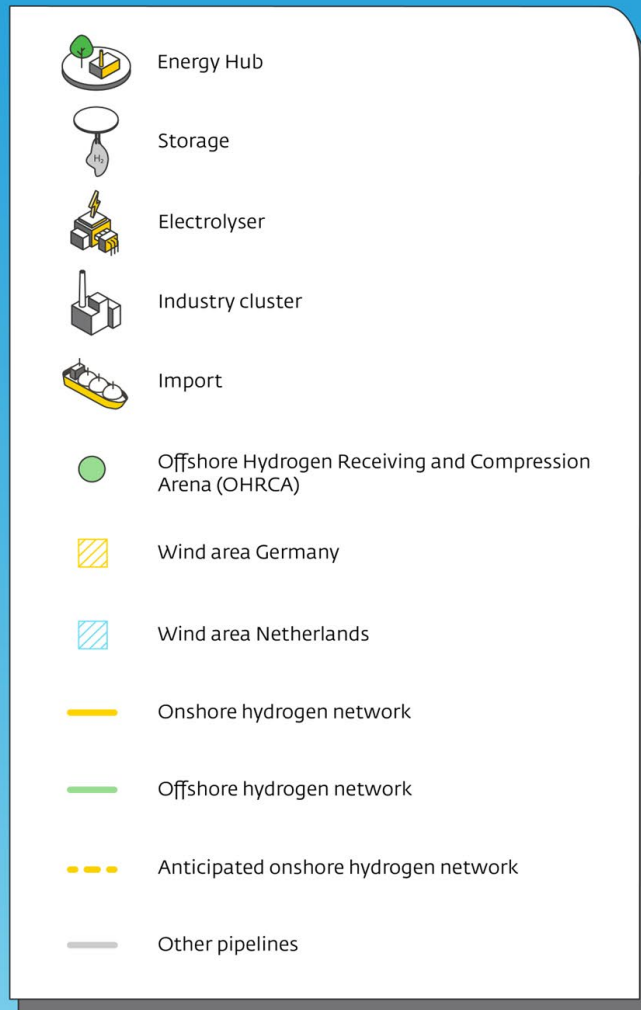


Gasunie

- Energy Infrastructure Company in the Netherlands and Germany
- Gasunie operates over 17.000 km of natural gas pipelines in NL and DE
- Transportation of natural gas, biogas, hydrogen, CO₂ and heat
- Fully ownership unbundled company
- 60 years of experience
- Gasunie develops hydrogen on- and offshore transport, storage and import infrastructure

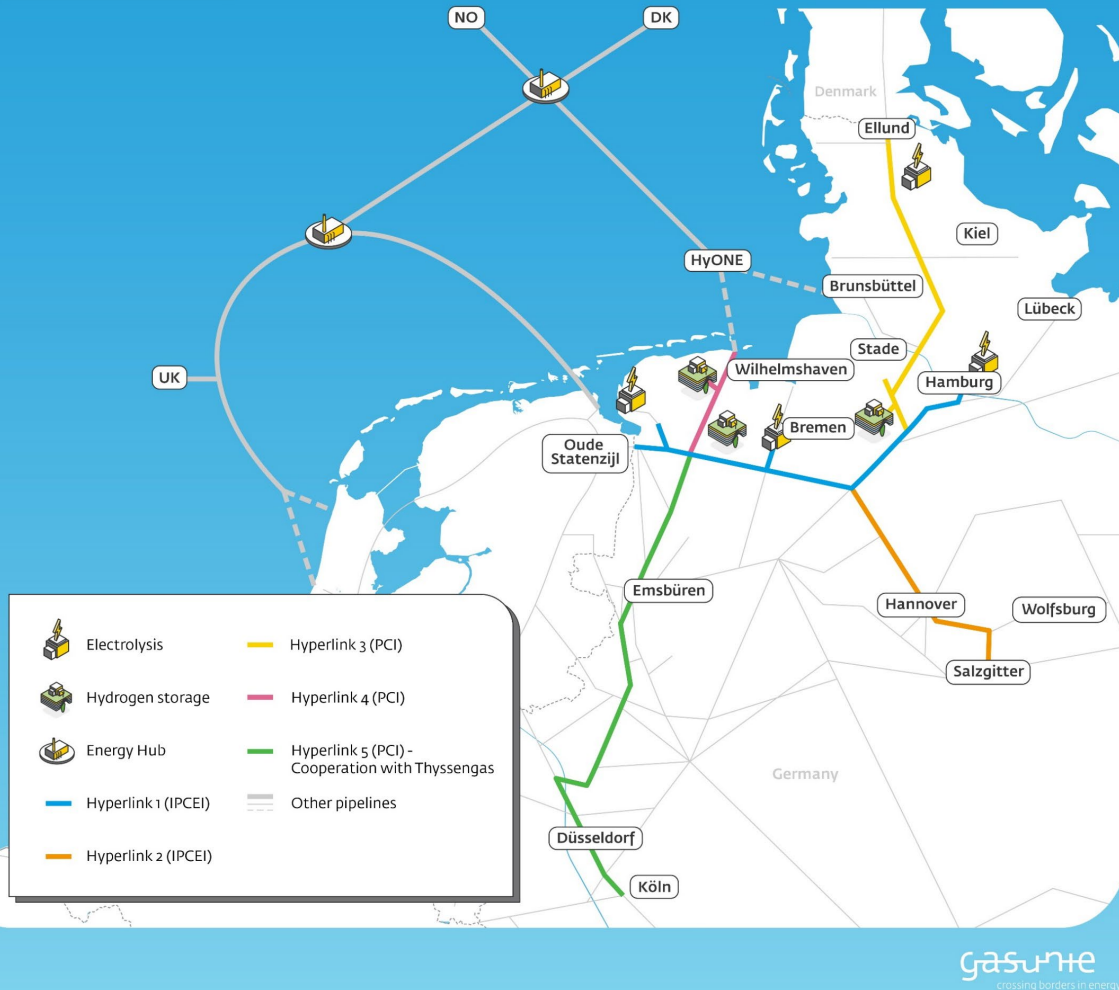


A Europe-wide hydrogen infrastructure is the prerequisite for ramping up the hydrogen economy, security of supply and increasing competitiveness.



Project Hyperlink Germany

Hyperlink 1-5



With **Hyperlink**, Gasunie is establishing a central hydrogen infrastructure in Northwest Germany.

- H2 pipeline system of approx. 1.000 km length, incl. re-purposing and new construction
- Integral part of German and European hydrogen network
- Cross-border connection to DK, NL and NO
- Construction works and ready for operation stepwise from 2026 till approx. end of decade
- Open access for transport customers
- Large-scale cross-border interconnection of:
 - Hydrogen producers and importers
 - Hydrogen storages
 - Industrial consumers
 - urban consumption centres

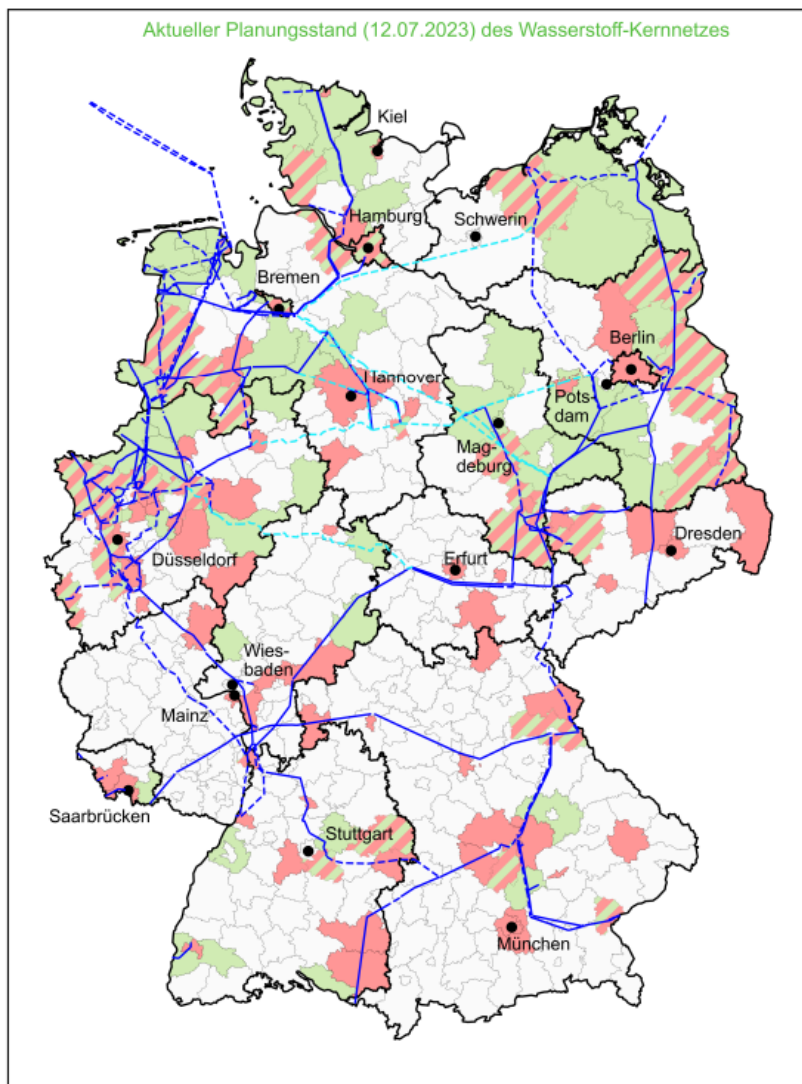
Hyperlink 3 – land-based, large-scale, cross-border connection between Germany and Denmark

- Total length 198 km (114 km re-purposing and 84 km new construction)
- Planning and realisation in a close cooperation between Gasunie and Energinet
- RfO Target End of 2028
- Enabling big-scale imports from green hydrogen from Denmark to Germany
- Connecting Danish and German hydrogen storage infrastructures in Lille Torup and Harsefeld
- Connecting domestic producers and demand centres in Schleswig-Holstein, Lower Saxony and other parts of Germany.

H₂ Network Germany & Denmark

Hyperlink 3 (PCI) + Danish backbone West (PCI)





Core Grid / Kernnetz

- Core Grid – solution for chicken and egg problem
- New legislation draft, introduced in Mai 2023
- All gas TSOs to elaborate on an initial hydrogen network (to be followed-up by an integrated NDP-process)
- Scenario set-up and network modelling as of 2032
- Parallel financing rules for Core Grid are under discussion and expected to be fixed in a package with Core Grid
- Official application for Core Grid expected to be submitted in Q4 2023
- BNetzA (German NRA) will conduct a consultation and take a final decision



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QUESTIONS



THANK YOU AND NEXT STEPS



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READ MORE

The maturation project builds on a prior work from Energinet. Find links below:

Feasibility-studie: [results-of-the-feasibility-study.pdf \(energinet.dk\)](#)

Markedsdialog: [market-dialogue-on-hydrogen-infrastructure.pdf \(energinet.dk\)](#)

MoU med Gasunie Deutschland: [Energinet and Gasunie strengthen collaboration on hydrogen infrastructure](#)

Market Assessment report with Gasunie Deutschland: [energinet-gasunie-rapport-2023.pdf](#)

GSD hydrogen: [Hydrogen Storage \(gasstorage.dk\)](#)

Gasunie Hyperlink: [Hyperlink 3 › Hyperlink \(hyperlink-gasunie.de\)](#)