

# GREENING THE DANISH GAS INFRASTRUCTURE

i-SUSTAIN visit to Energinet 12-09-2023

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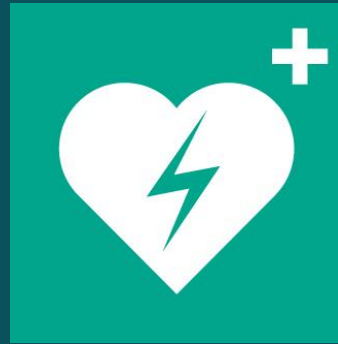
# Agenda



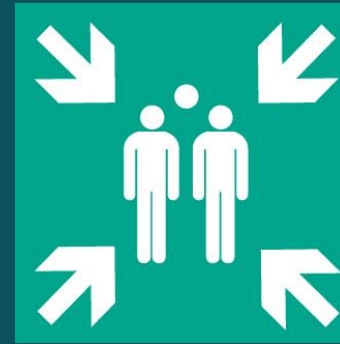
1. Who are we?
2. Danish Biomethane Experiences
3. Future Danish Hydrogen Backbone
4. EU Developments and Regulation
5. Creating value through Hydrogen storage
6. Plans for onshore CO2 storage in Stenlille



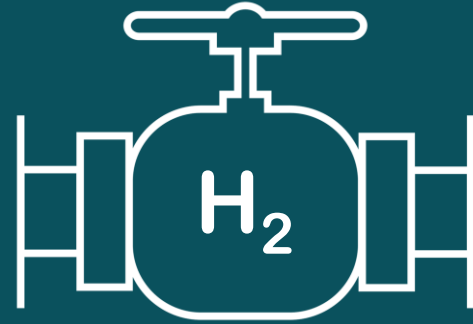
EMERGENCY EXITS



DEFIBRILLATORS



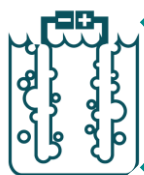
RALLYING GROUND



FUTURE DANISH HYDROGEN BACKBONE

# HYDROGEN HAS GAINED POLITICAL FOCUS

Danish PtX agreement (March 2022)



4-6 GW electrolysis i 2030



Enabling the build-out of  
H2 infrastructure



1.25 billion DKK for H2  
production subsidy scheme



Establishment of PtX  
Taskforce



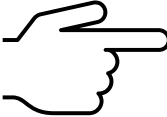
Geographically  
differentiated consumption  
tariffs



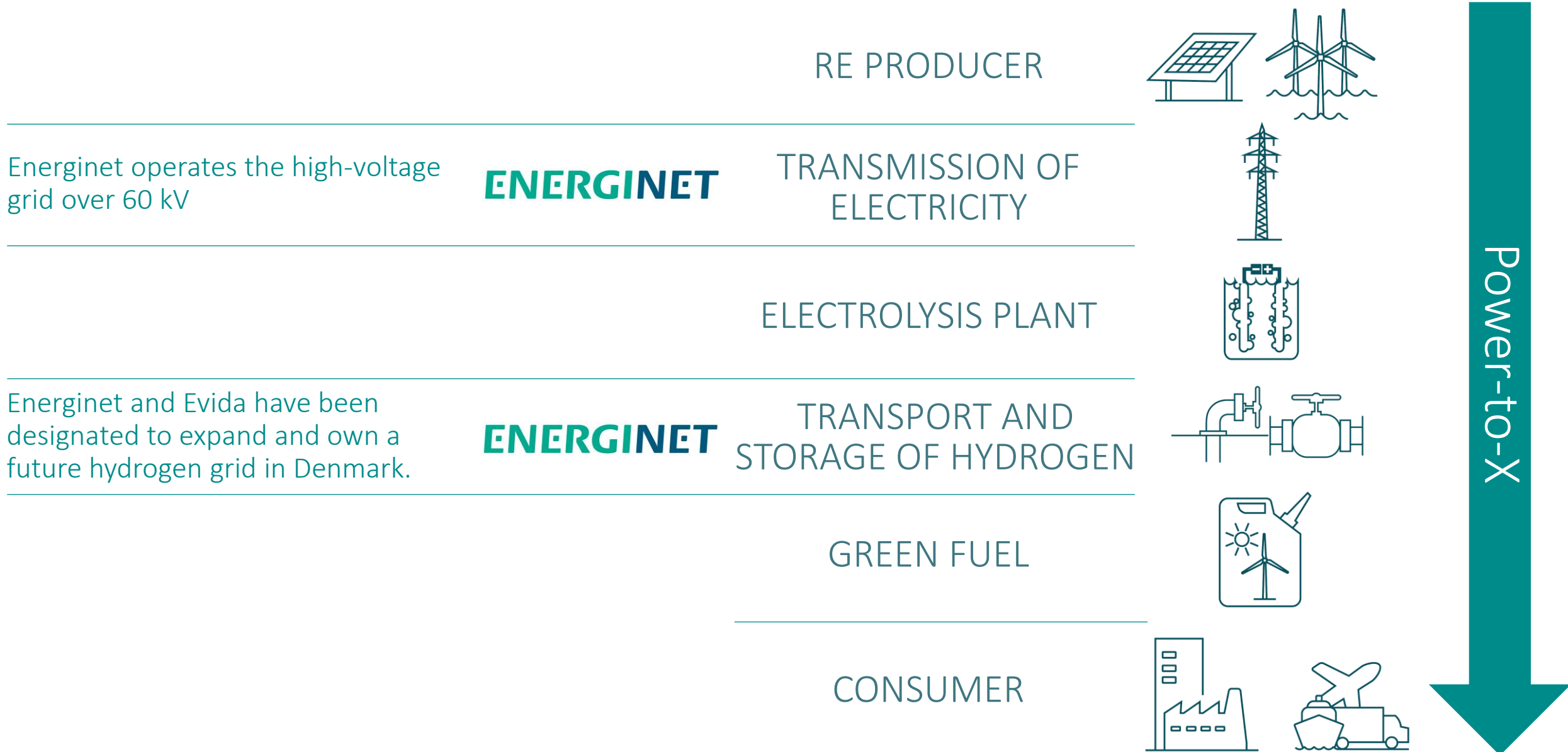
Denmark as a net exporter  
of green energy in 2030.

# HYDROGEN HAS GAINED POLITICAL FOCUS

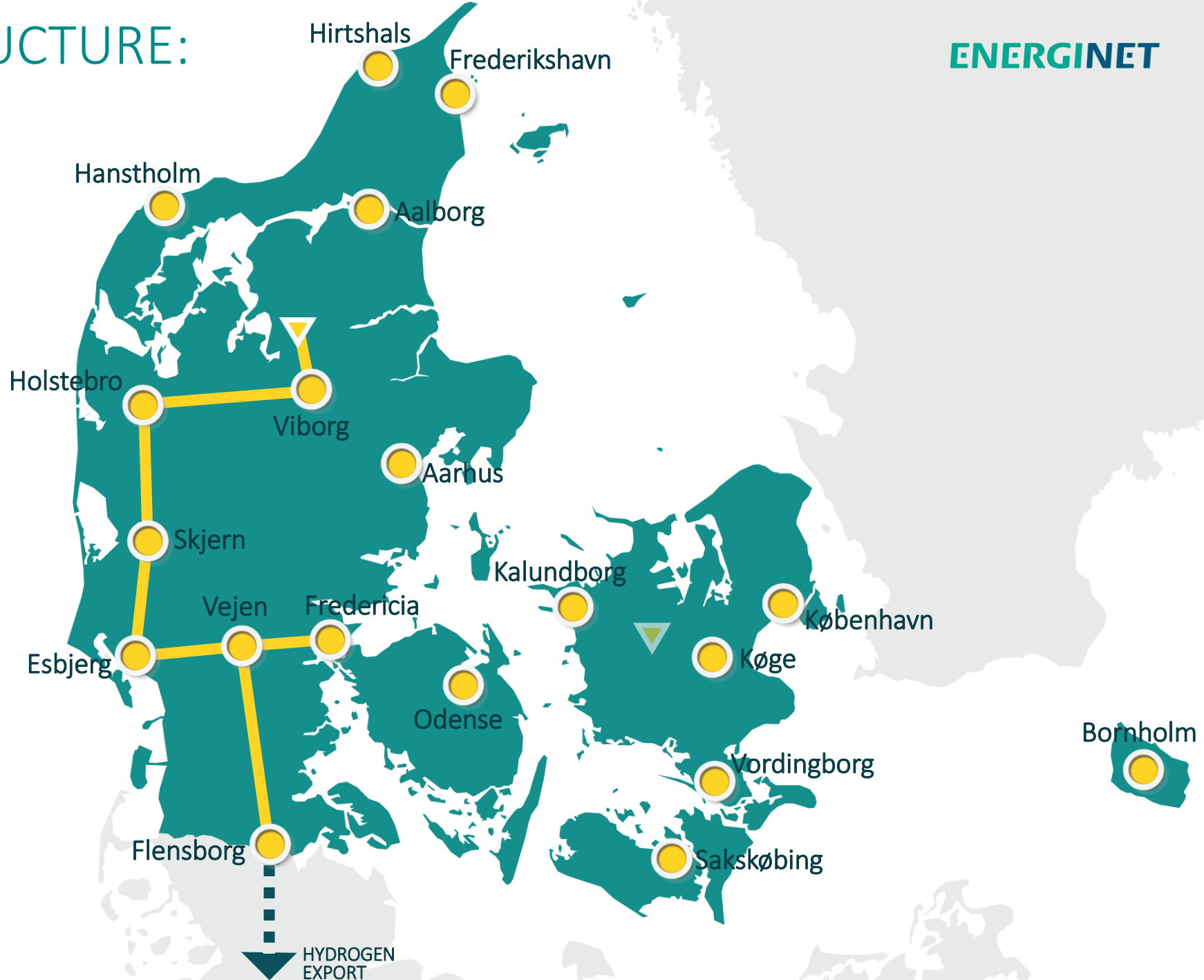
Political agreement on ownership and operation of the future Danish hydrogen grid (May 2023)

- Public ownership of the Danish H2 grid through Energinet (power and gas TSO) and Evida (gas DSO).
  - Energinet: Build backbone incl. cross-border connection and connection to H2 storage + H2 System Operator responsibility.
  - Evida: Connecting domestic H2 producers and consumers (in clusters) + connection of these to a collective H2 network.
-  ➤ Currently waiting for a political decision on framework conditions for the financing of the future H2 network.

# ENERGINET'S ROLE IN THE PTX SUPPLY CHAIN



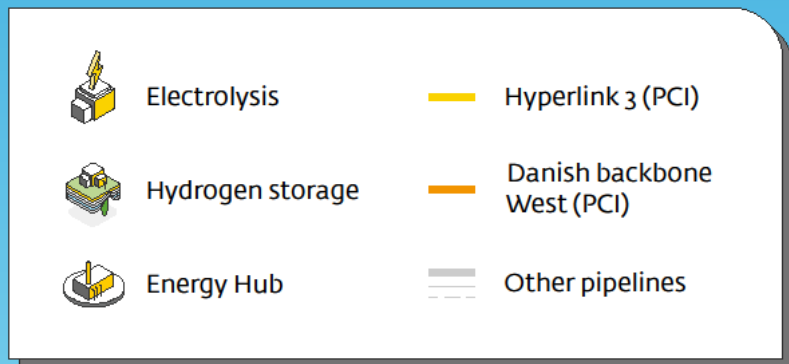
# HYDROGEN INFRASTRUCTURE: BACKBONE – WESTCOAST



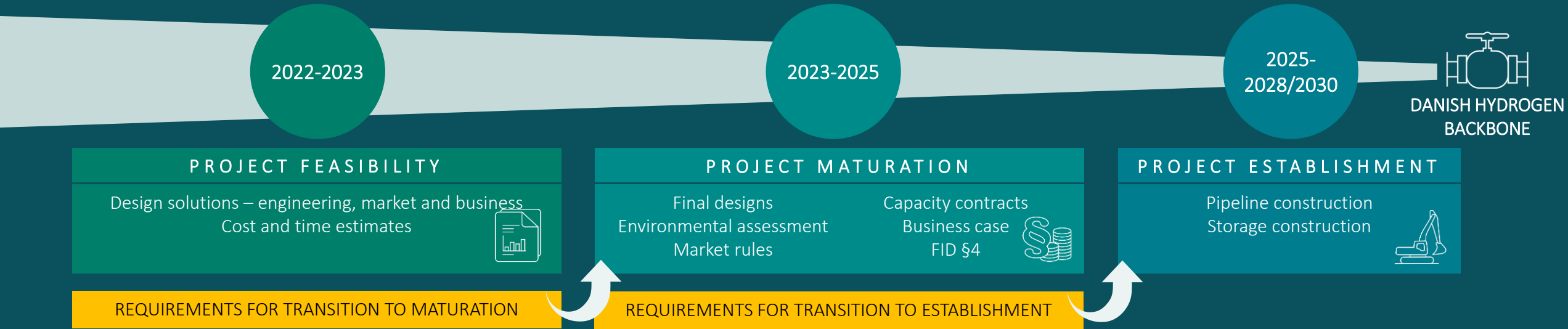


# H<sub>2</sub> Network Germany & Denmark

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



# HYDROGEN BACKBONE TIMELINE





# EU DEVELOPMENTS AND REGULATION

# EUROPEAN HYDROGEN BACKBONE

- 32 TSOs from 28 countries
- 53.000 km hydrogen pipeline infrastructure by 2040
- Over 60 % will be based on repurposed existing natural gas pipelines
- This makes it possible to create the European Hydrogen Backbone at affordable cost



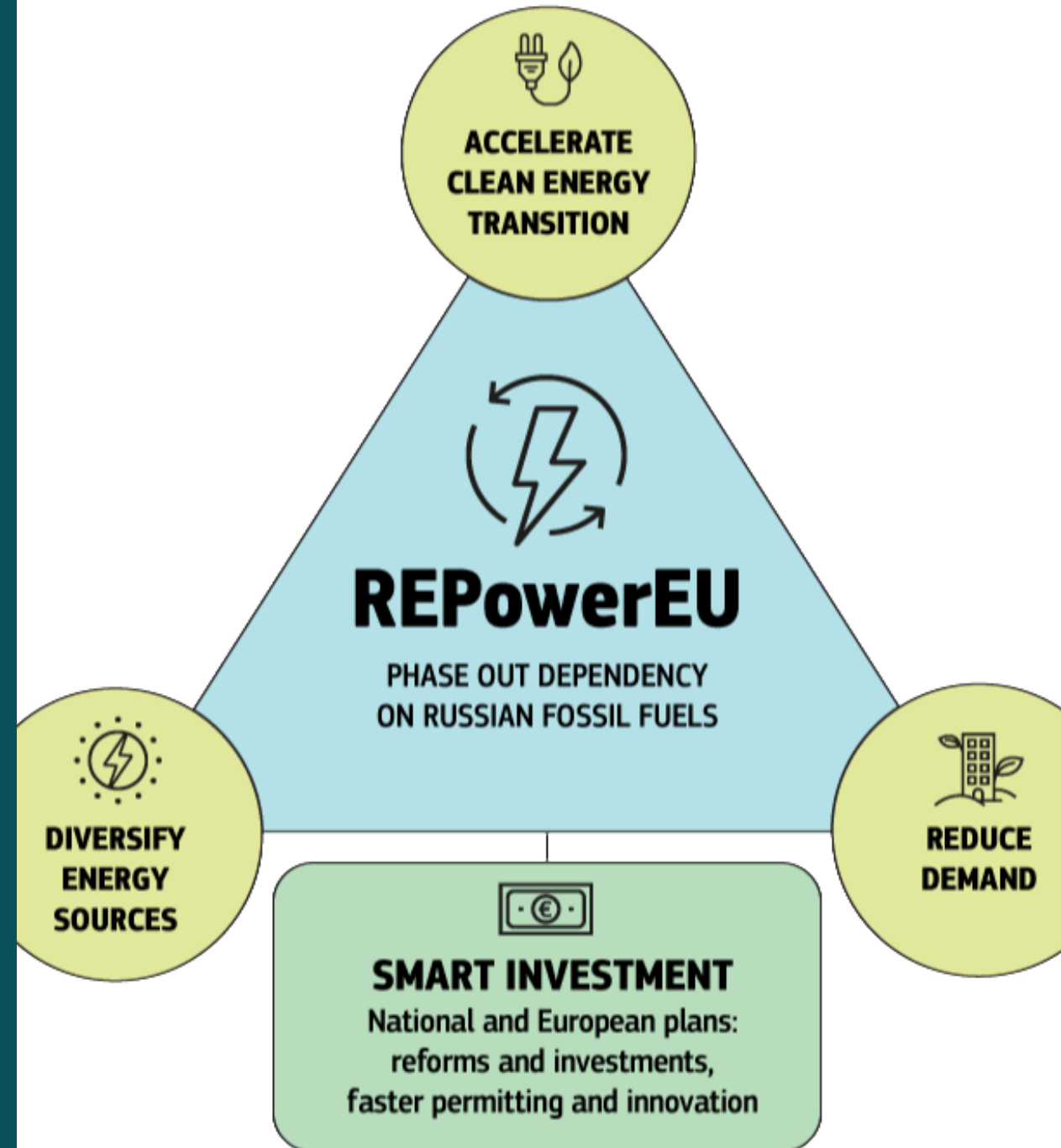
# REPOWEREU (2030)

Hydrogen Accelerator:

- 10 mio tonnes of domestic hydrogen production
- 10 mio tonnes of renewable hydrogen imports

Biomethane:

- 35 bcm of domestic biomethane production



# HYDROGEN AND GAS MARKETS DECARBONISATION PACKAGE

- I. Enable the development of dedicated hydrogen infrastructure and market
- II. Facilitate the integration of renewable and low-carbon gases into the existing gas network
- III. Ensure a more integrated network planning between electricity, gas, and hydrogen networks.
- IV. Promote consumer protection and engagement in renewable and low carbon gas markets
- V. Improve resilience and security of supply





# REGULATORY APPROACH HYDROGEN INFRASTRUCTURE AND MARKET

- Centered around proven regulatory principles from electricity and gas networks: Third Party Access, unbundling, tariff regulation.
- Point of departure : hydrogen value chain = immature.
- Phased approach to the introduction of market and network regulation.
- Flexibility in the application of these regulatory principles for a number of years.
- BUT application of main regulatory principles for mature markets is defined upfront.



# RFNBO DELEGATED ACT

The act will ensure that all RFNBOs are produced from renewable electricity and defines under which conditions hydrogen can be considered as an RFNBO, ie. renewable hydrogen.

## ADDITIONALITY

Hydrogen production should add to the deployment of renewable energy.

## TEMPORAL CORRELATION

Renewable hydrogen should be produced only when renewable electricity is available.

## GEOGRAPHICAL CORRELATION

There should be no grid congestion between the place where the renewable electricity is produced and where the renewable hydrogen is produced.



# EUROPEAN HYDROGEN BANK

European Commission intends to open the pilot auction in November 2023. Auction cleared Q1 2024.

- Budget: EUR 800mn
- Auctioned good: Renewable Hydrogen
- Support in form of a fixed premium in EUR/kg of renewable hydrogen produced, over 10 years
- Bids ranked on price budget allocated to the projects with the lowest specific support requirements
- Pay as bid
- Output based support (upon verified and certified production of volumes), no payments before entry into operation
- Maximum realisation period (time to entry into operation) of 3.5 years, can be prolonged to 4 years under penalty

