

# The Danish Power-to-X Potential

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Power-to-X in Denmark  
Invest in Denmark 03.03.22



# Hydrogen Denmark's members cover the entire value chain for hydrogen and PtX

GreenLab

HYDROGEN VALLEY®

Klimafonden  
skive

Clusters



**COWI**  
**DGC**  
Danish Gas Technology Centre  
**DNV**  
DTU Management Engineering  
Department of Management Engineering  
DTU Energy  
Department of Energy Conversion and Storage  
**RAMBOLL**  
**SDU**  
AALBORG UNIVERSITY  
DENMARK

Knowledge



**Air Liquide**  
**Crossbridge**  
ENERGY FREDERICIA  
**EUROPEAN ENERGY**  
Eurowind Energy.  
**Everfuel**  
**STRANDMØLLEN**  
**Orsted**

Energy  
producers



**ADVENT**  
**BALLARD**  
**Blue World**  
Technologies  
**Electrochaea**  
**H**  
GREEN HYDROGEN SYSTEMS  
**HALDOR TOPSOE**  
**HYUNDAI**  
**ITM POWER**  
Energy Storage | Clean Fuel  
**nel**  
**SIEMENS Gamesa**  
RENEWABLE ENERGY  
**Swagelok**

OEMs



**evida**  
**GAS STORAGE DENMARK**

Infrastructure

# The Danish potential for hydrogen & PtX is tremendous

The world-leading capabilities on both renewable energy and PtX-technologies make Denmark a global frontrunner

# We are on the threshold of a green, industrial revolution

The development is driven by the strong, Danish hydrogen and PtX industry



# 20 active hydrogen projects



# The industry is realising the potential

Cum. MW electrolysis



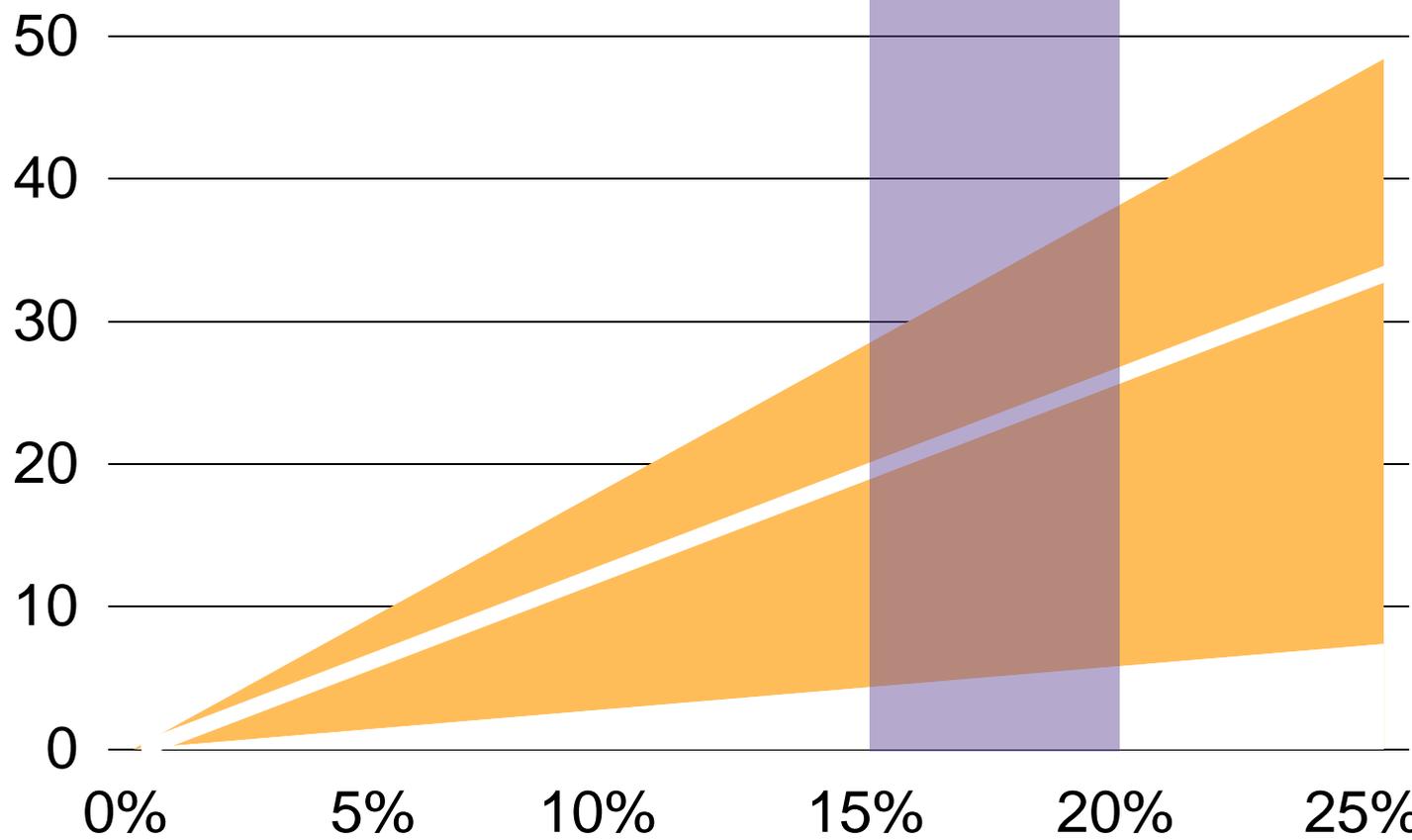


**This means thousands of new jobs  
in a new industry and energy sector**

New jobs, export and economic growth in Denmark and globally

# Market value for technology export in 2030

Billion DKK



A 15-20% Danish market share of the EU's 40 GW electrolysis-capacity is estimated to represent an export value of 4-33 billion DKK.

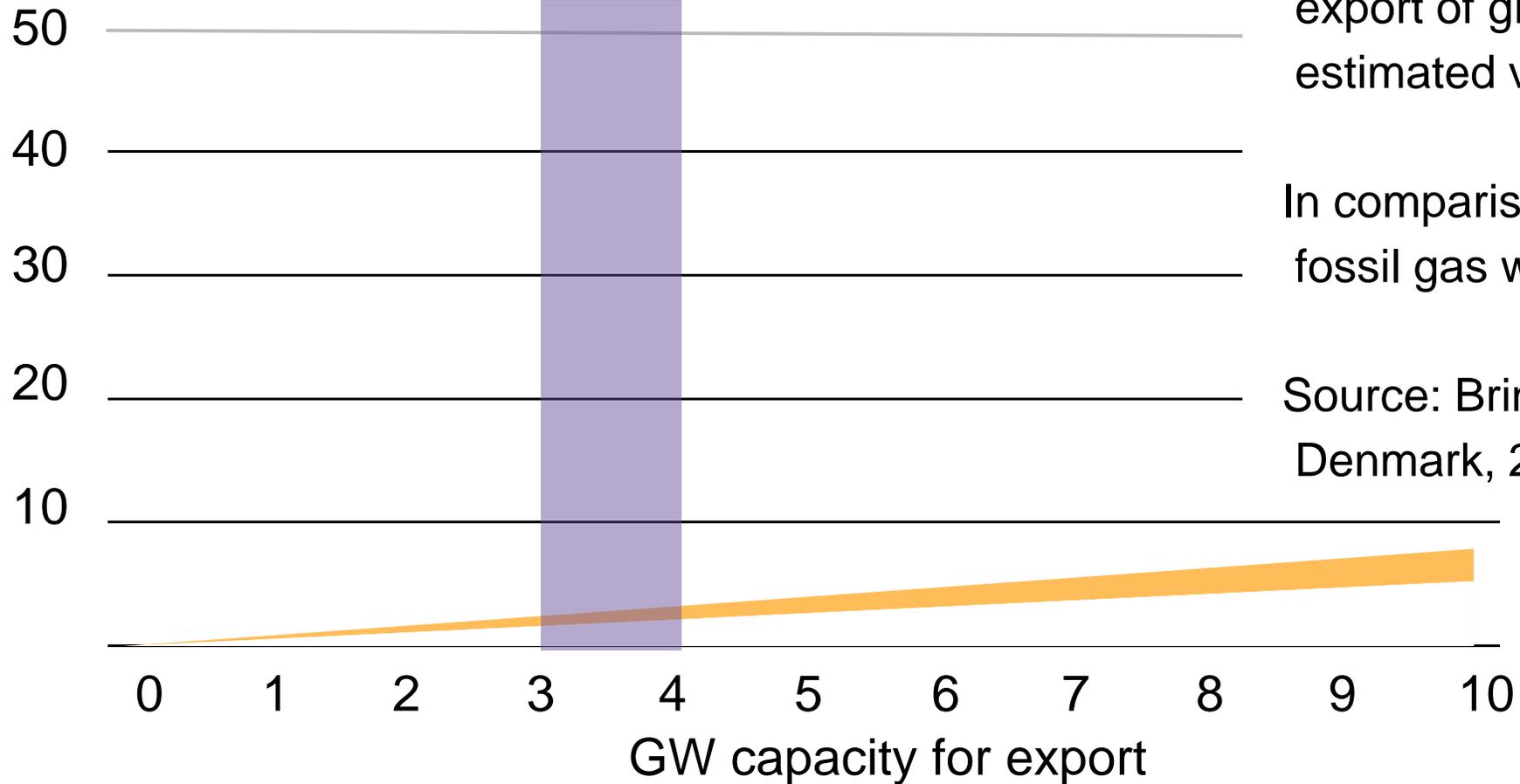
In comparison: today Danish companies' export within green technologies and services is worth 90 billion DKK.

Source: Brint i Tal, Hydrogen Denmark, 2021.

Danish market share

# Market value for energy export 2030

Billion DKK



A capacity of 3-4 GW dedicated to export of green hydrogen has an estimated value of 1.7-3.5 billion DKK.

In comparison: the Danish export of fossil gas was worth 1.5 billion DKK.

Source: Brint i Tal, Hydrogen Denmark, 2021.



# Green alternatives for fossil energy are imperative

This is a matter of urgency in dealing with the climate crisis, as well as in ensuring energy independence, job creation and new growth markets

# Danish technology can help decarbonise Europe

Gas-grid, industry, transport, agriculture and other hard-to-abate sectors can be decarbonized with green hydrogen



# Renewable energy outside the electricity grid

Hydrogen substituting fossil gas  
easing European dependency



A purple-tinted map of Ukraine and surrounding regions. The word 'UKRAINE' is written in large, bold, black letters across the center of the map. Other cities and regions labeled include Brosl, Rivne, L'viv, Chernivtsi, Kyiv, Kharkiv, Dnipropetrovs'k, Mykolayiv, Donetsk, and the Sea of Azov. The word 'ROMANIA' is visible at the bottom. The text 'Ukraine was central in the European transition, now we must deliver for them' is overlaid in white.

Ukraine was central in the European transition,  
now we must deliver for them

Ukraine was key in the European transition as the country was set to contribute to the 40GW outside the EU by 2030. Given the atrocious war the need for fossil independence has become a matter of absolute urgency. We must do more faster to deploy VE-based Hydrogen solutions.

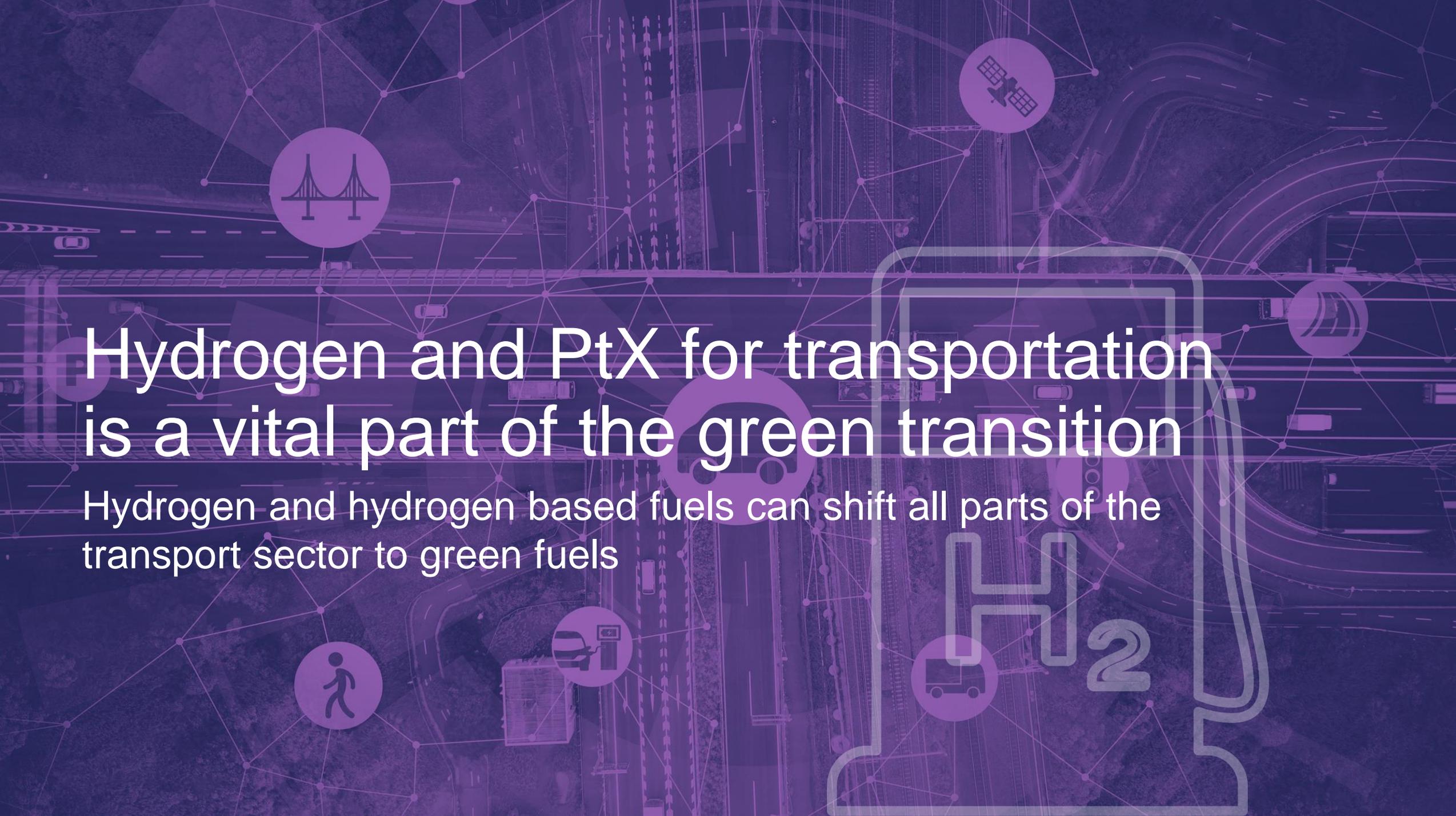


*But in the long run, it is our  
switch to renewables and  
hydrogen that will make us  
truly independent.*

**President Von der Leyen, March 1<sup>st</sup> 2022**



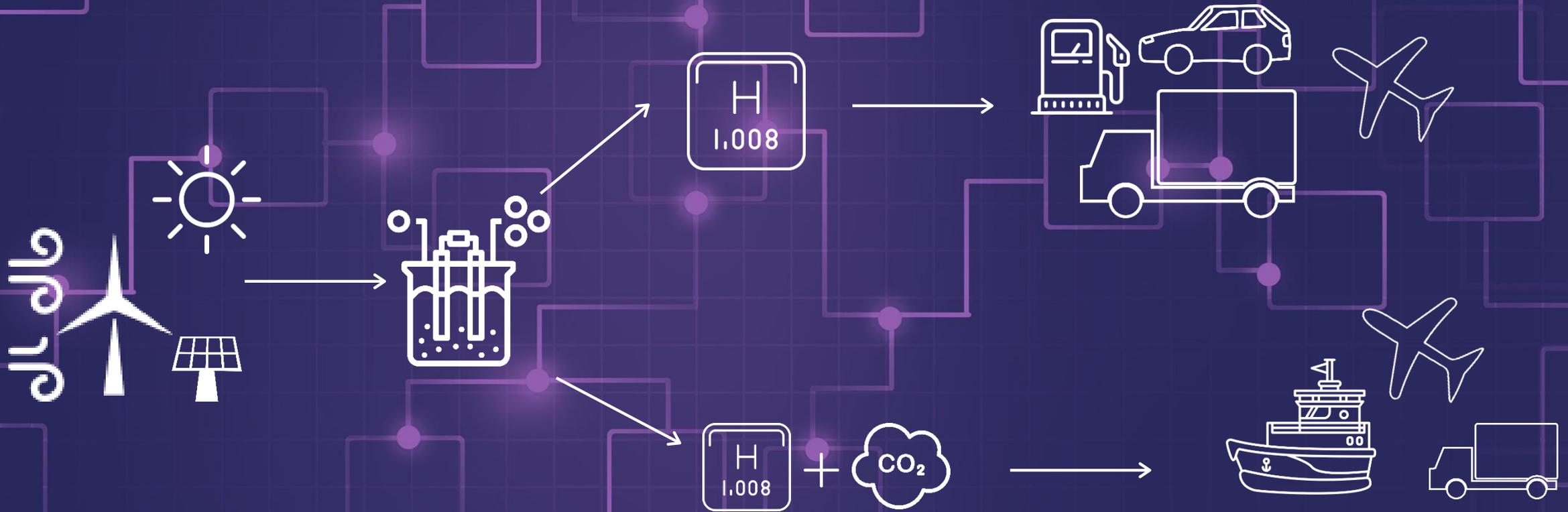
96% of the European gas grid  
can be used for hydrogen

An aerial photograph of a road network is overlaid with a purple grid and various icons. The icons include a bridge, a satellite, a person, a car, a truck, and a large 'H2' symbol. The text is centered over the image.

# Hydrogen and PtX for transportation is a vital part of the green transition

Hydrogen and hydrogen based fuels can shift all parts of the transport sector to green fuels

# Hydrogen and PtX fuels ensures efficient utilisation of renewable energy





# Hydrogen and PtX can ease the dependence on fossil fuels

Hydrogen and PtX can not only decarbonise land-based transport but also shipping and aviation

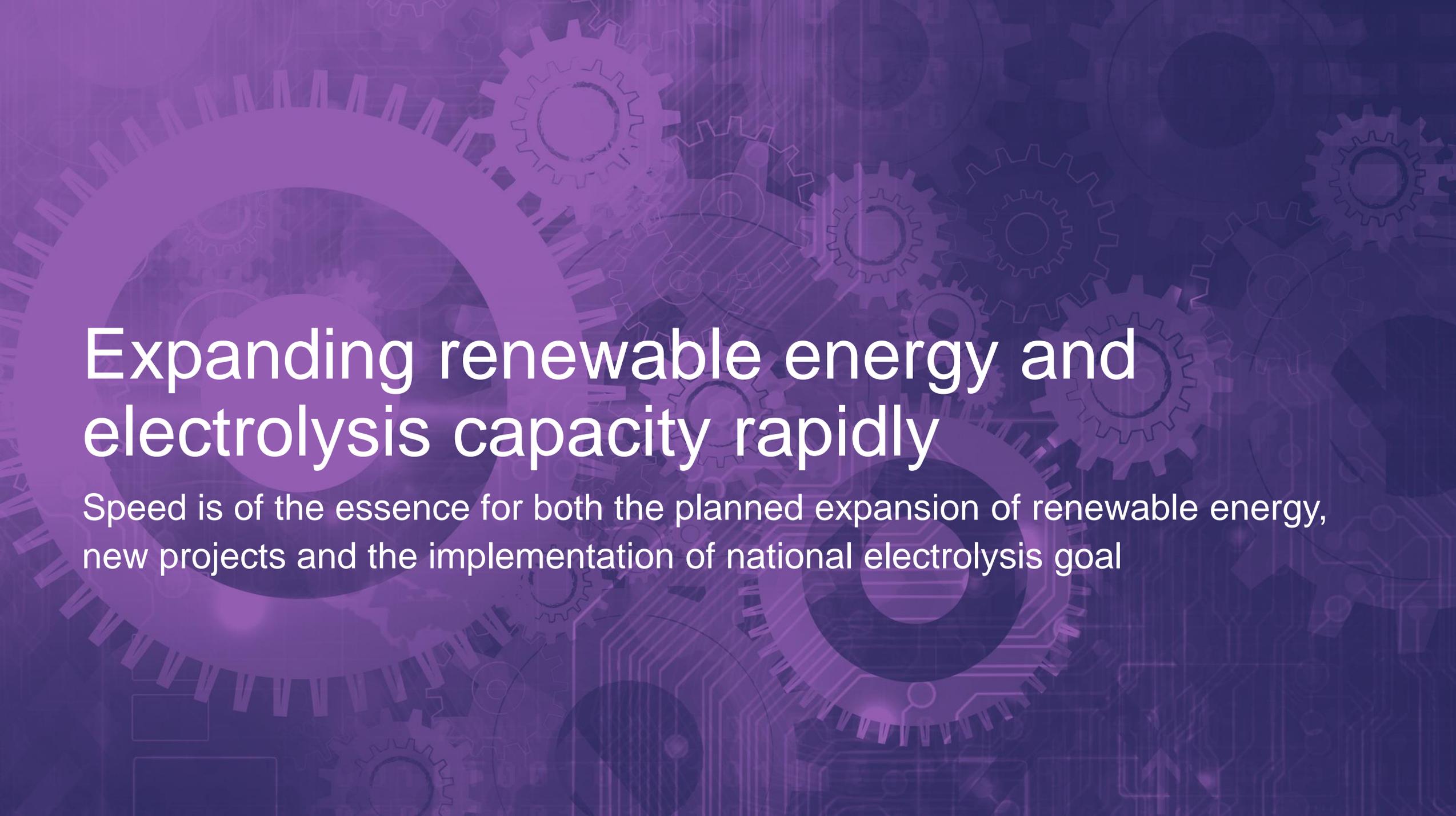
# This requires investments and a massive scale-up in production

If Denmark is to realise the potential for hydrogen and PtX we need to act now: investments, scale-up and a strategy for industrialisation and export



# The basis of the potential is enough renewable energy

We need a massive expansion in the Danish production of renewable energy to ensure both direct and indirect electrification



# Expanding renewable energy and electrolysis capacity rapidly

Speed is of the essence for both the planned expansion of renewable energy, new projects and the implementation of national electrolysis goal



We have the capacity and the capabilities  
to play a key-role in the global transition

But we must act now!



# Denmark can become the epicenter of the green industrialisation

Buidling on the heritage from the wind turbines we can ensure that hydrogen and PtX become the next Danish export success

The background is a dark purple gradient. It features several faint, light purple gears of various sizes scattered across the right side. A network of thin, light purple lines connects several small, semi-transparent purple spheres, creating a web-like structure that spans across the middle and right portions of the image.

Thank you for your attention!

[www.brintbranchen.dk](http://www.brintbranchen.dk)