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CLEANTECH CONFERENCE: DRIVING SUSTAINABLE INNOVATION

How to boost cleantech
manufacturing in the EU



INNOVATION FUND

Funded by the EU Emissions Trading System

PROJECT 'TOPSOEC' – INDUSTRIALIZING SOEC ELECTROLYZER TECHNOLOGY

JESPER JUUL DA SILVA FRANCISCO
Topsoe



INNOVATION FUND

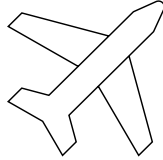
Funded by the EU Emissions Trading System

TOPSOE AT A GLANCE: OVER 80 YEARS OF INNOVATION AND LEADERSHIP

We are a leading global provider of technology and solutions for the energy transition. We combat climate change by helping our customers and partners achieve their decarbonization and emission reduction goals.

Based on decades of scientific research and innovation, we offer world-leading solutions for transforming renewable resources into fuels and chemicals for a sustainable world, and for efficient and low carbon fuel production and clean air.

We were founded in 1940 and are headquartered in Denmark.

1/3 

of the current renewable diesel and SAF operating capacity is based on Topsoe technology

+2,800
employees

9.4B
(DKK)
in revenue

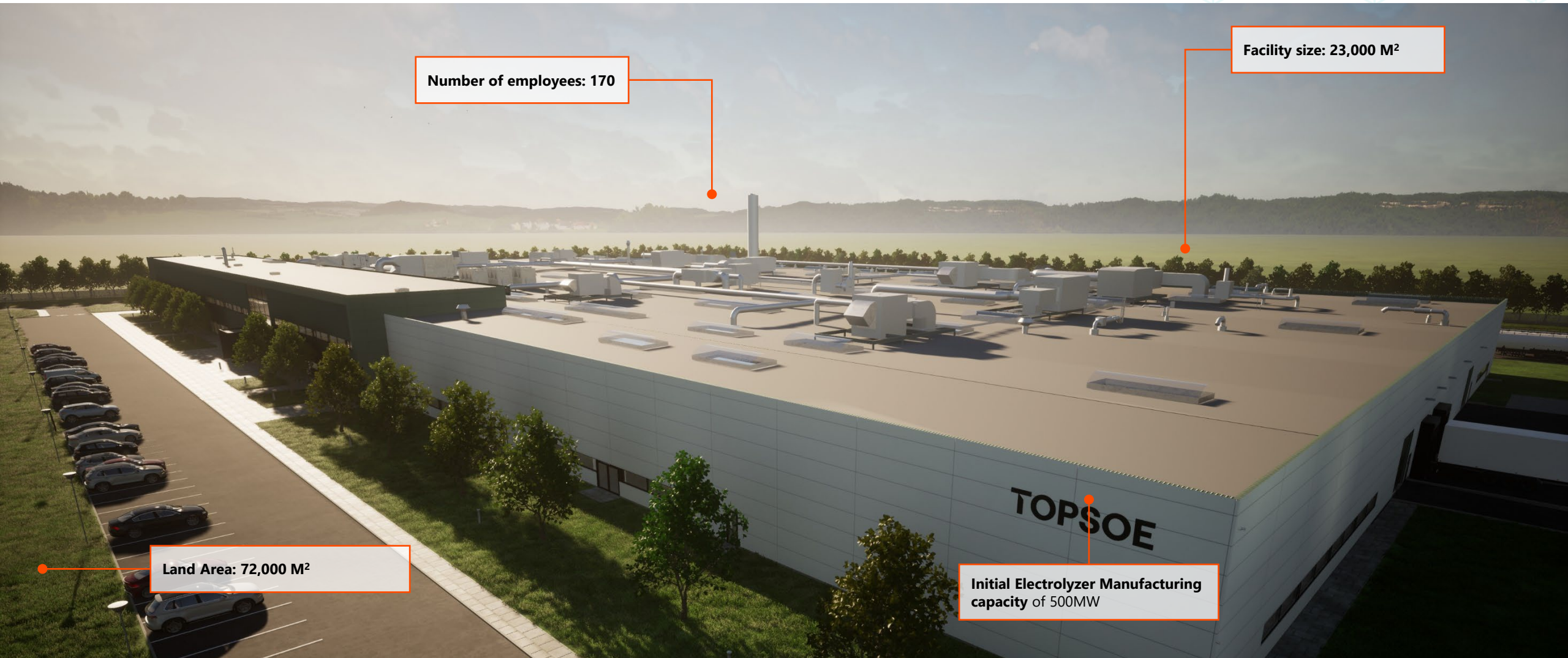


700M
(DKK)
invested in R&D in 2023

+600
patent families

PROJECT TOPSOEC – 500 MW OF FIRST-OF-ITS-KIND SOEC STACK MODULE MANUFACTURING

 HALDOR TOPSOE'S VEJ 2, HERNING, DENMARK



Number of employees: 170

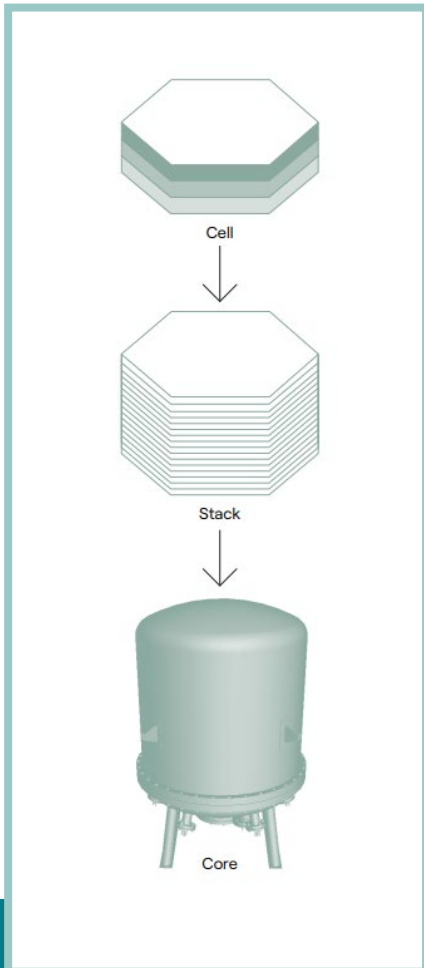
Facility size: 23,000 M²

Land Area: 72,000 M²

Initial Electrolyzer Manufacturing capacity of 500MW

TOPSOE'S SOLID OXIDE ELECTROLYSIS TECHNOLOGY IS UP TO 30% MORE ENERGY EFFICIENT THAN INCUMBENT TECHNOLOGIES

TOPSOE'S SOEC TECHNOLOGY FROM CELLS TO CORES



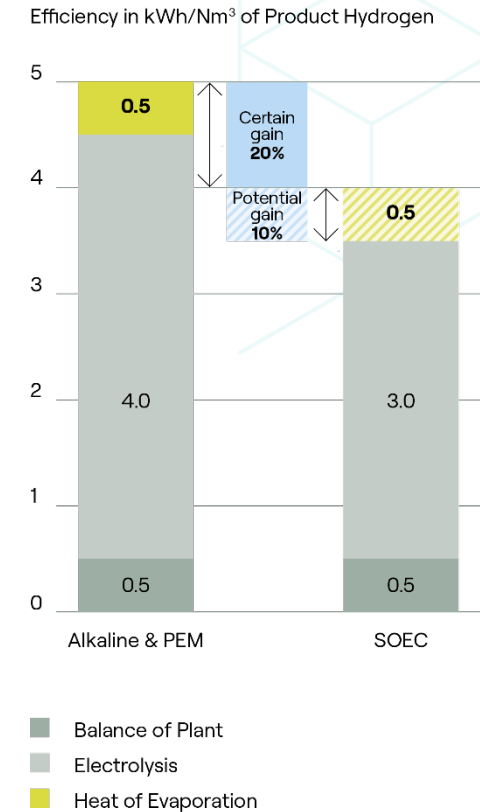
Topsoe's Solid Oxide Electrolysis **Cells**

Stacked on top of each other into a '**Stack**'

Bundled together in a '**Core**' – the heart of the electrolyzer



DELIVERING HIGHER EFFICIENCY THAN INCUMBENT TECHNOLOGIES



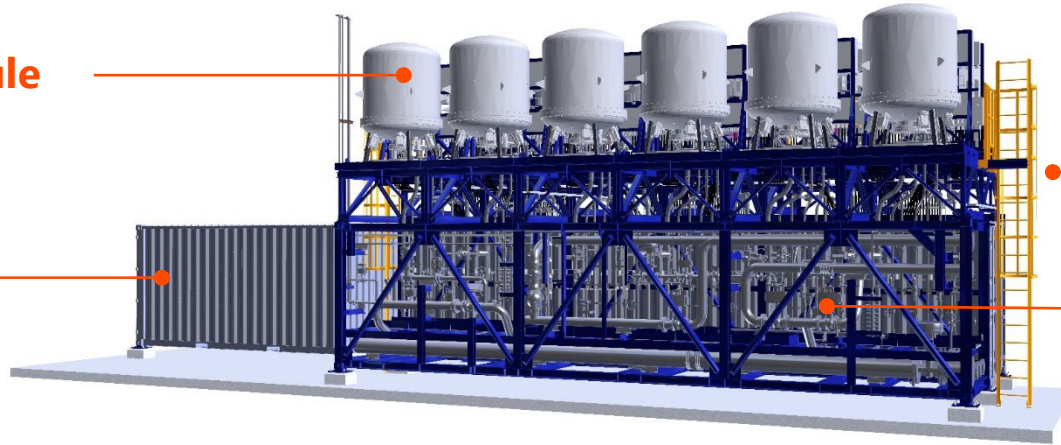
FROM CONCEPT TO NEXT GENERATION

HOW WE GOT HERE AND WHAT COMES NEXT

Electrolyzer core module

Containing SOEC stacks

Transformer



Power module

Containing converters, instrumentation and required electrical components.

Piping module

DEVELOPMENT TIMELINE

1980

Solid Oxide Fuel Cell (SOFC) developed

SOFC cell and stack can also be used as SOEC

Electrolysis of both water and CO₂

2015

Focus Shifts to SOEC

Demonstration and industrial SOEC units since 2015

Continuous optimization & innovation

Market leading efficiencies

2025

World's largest SOEC manufacturing facility

Initial 500 MW annual production capacity

Expansion to 1.2 GW Annually by 2031

Potential extension to 5 GW capacity

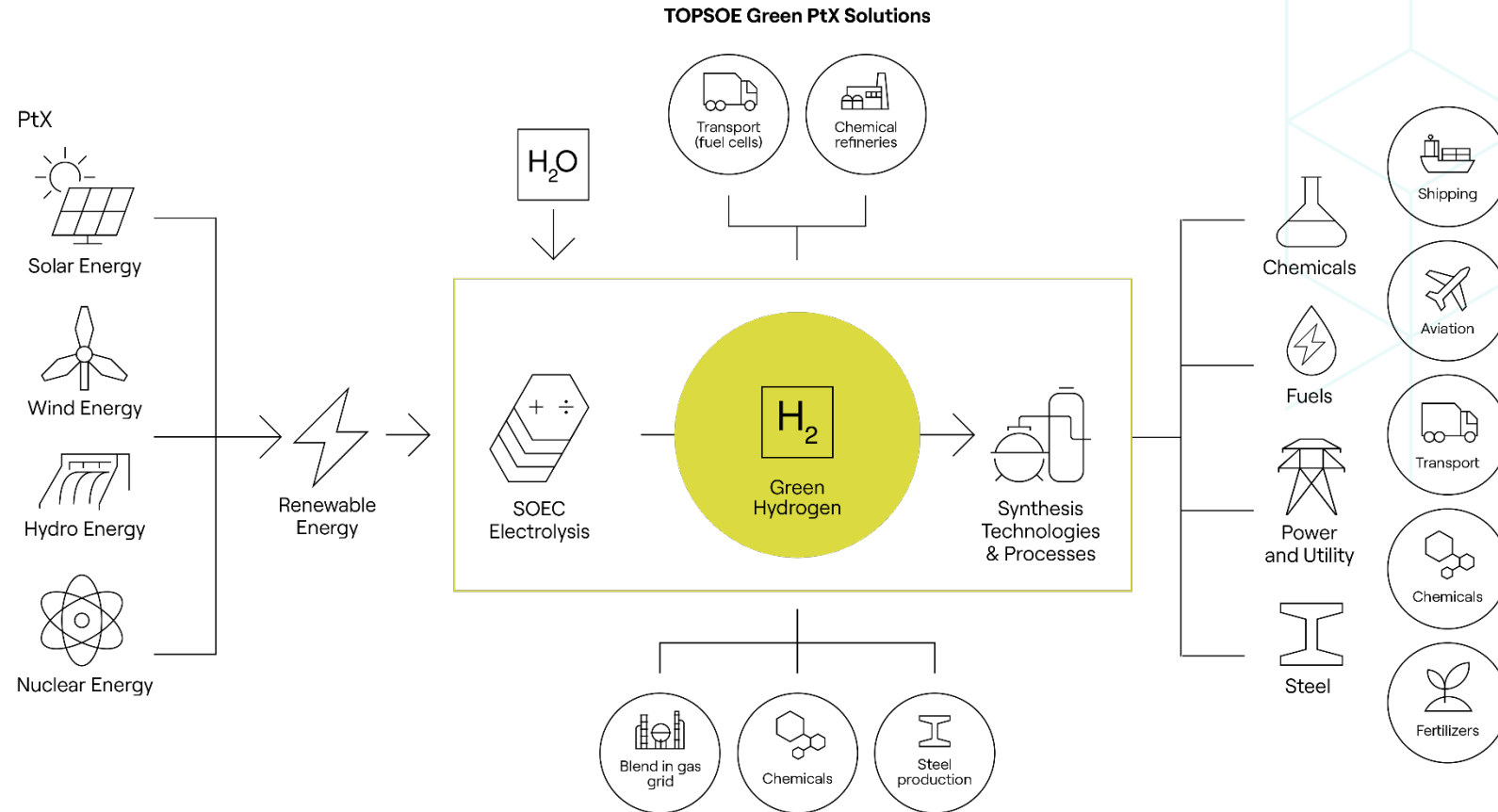


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WE CONVERT RENEWABLE ELECTRONS INTO GREEN FUELS AND CHEMICALS

UNMATCHED ABILITY TO DELIVER THE GREEN SOLUTIONS NEEDED FOR THE ENERGY TRANSITION!



THANK YOU!



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