

# The strategic role of hydrogen

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**RAMBOLL**

Bright ideas.  
Sustainable change.



## Eva Ravn Nielsen

Global Advisor - Hydrogen & Power-to-X Ramboll

M.Sc. Chem. Eng., Ph.D. from DTU

Certified Senior Project Manager, IPMA-B.

14 years in the industry as project manager

10 years as Centre Manager for Fuel Cell and Hydrogen Technologies at Technical University of Denmark

Hydrogen & Power-to-X consultant at Ramboll since 2020



## Ramboll in brief

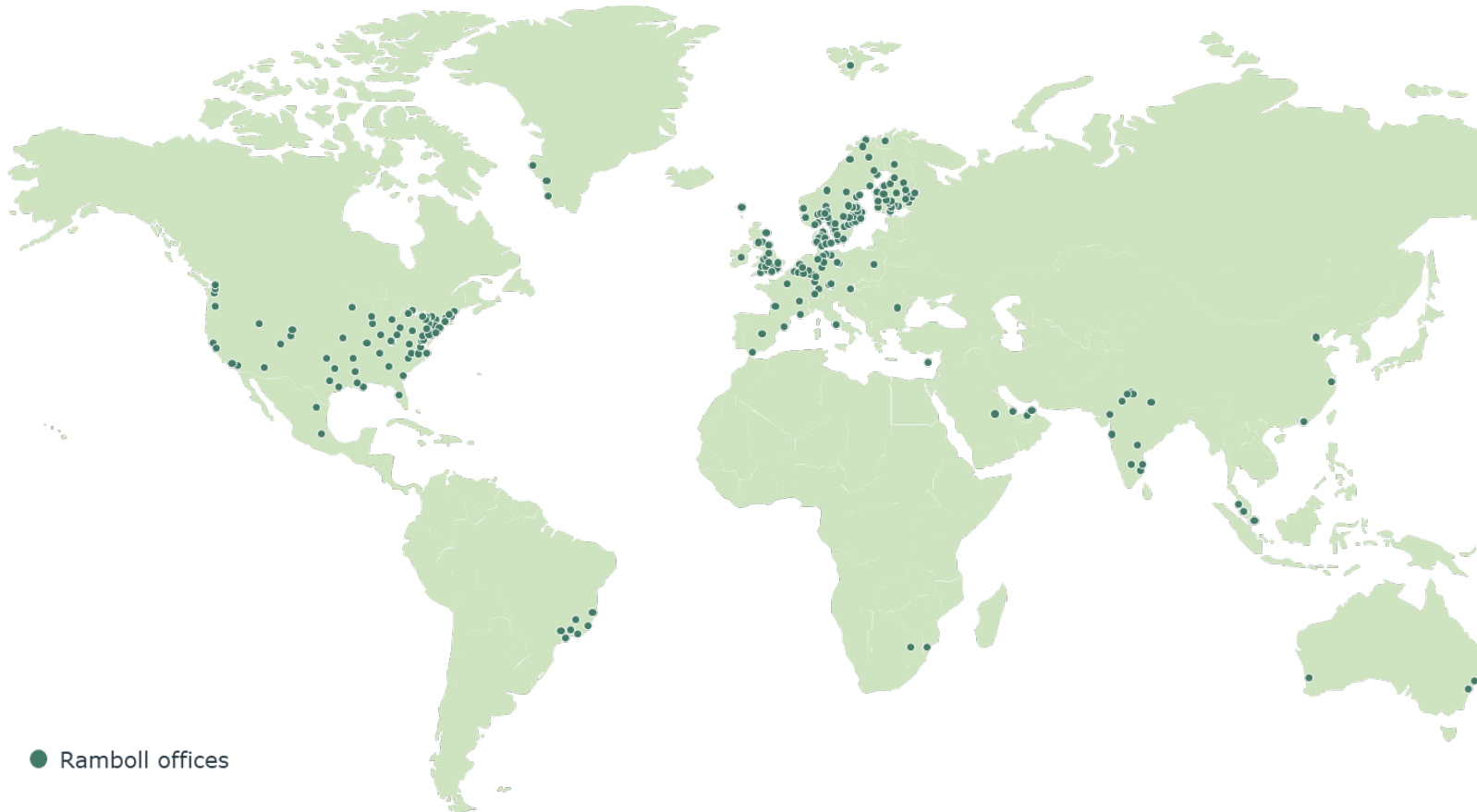
Independent Engineering, Architecture and Consultancy company

- 18.000 experts
- Top 10 leading energy consultancy in Europe
- Owned by an independent foundation:  
The Ramboll Foundation

### **Mission:**

To create sustainable societies where people and nature flourish

Ramboll is a global engineering consultancy company with 300 offices in 35 countries.



We have completed 200 PTX projects and studies since 2020

Local experience & global expertise

Multidisciplinary and holistic approach



Transport



Buildings



Water



Environment & Health



Energy



Architecture & Landscape



Management Consulting

# The holistic approach

# Holistic approach to fighting climate change

## Reduce GHG emissions by:

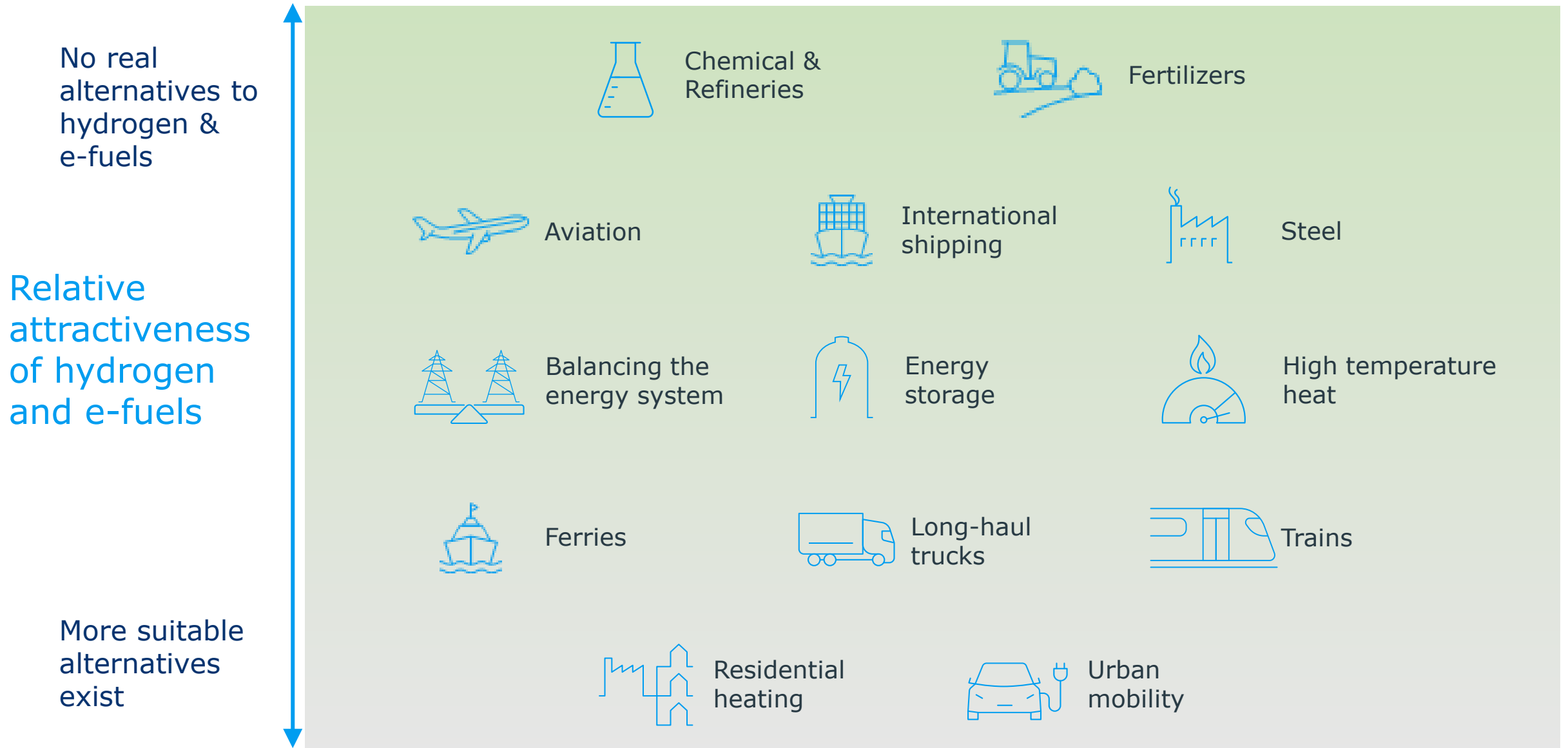
1. Reduce energy demand
2. Transform the power supply  
Fossil fuels → Renewable energy
3. Only *then*, the green hydrogen and e-fuels will help reduce CO<sub>2</sub> emissions

## Therefore,

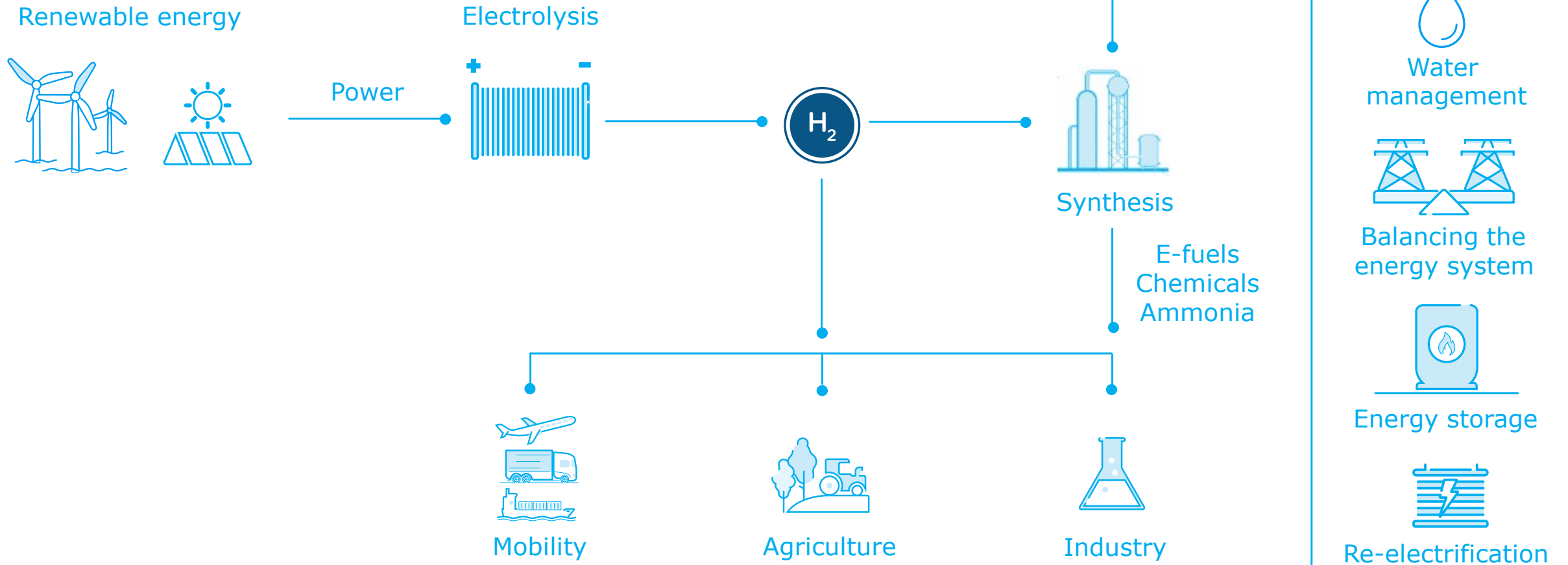
- Buildout renewable energy
- Buildout electrical grid
- Prepare the supply chain infrastructure, and usage of green hydrogen & e-fuels
- Improve the business case



# The Hydrogen Hierarchy



# Power-to-X will influence our entire energy system





# Project examples



# PtX market and regulatory study for the Baltic Region

## The challenge

Conduct a market study to understand the **upcoming European and global markets** for e-fuels and Power-to-X (PtX).

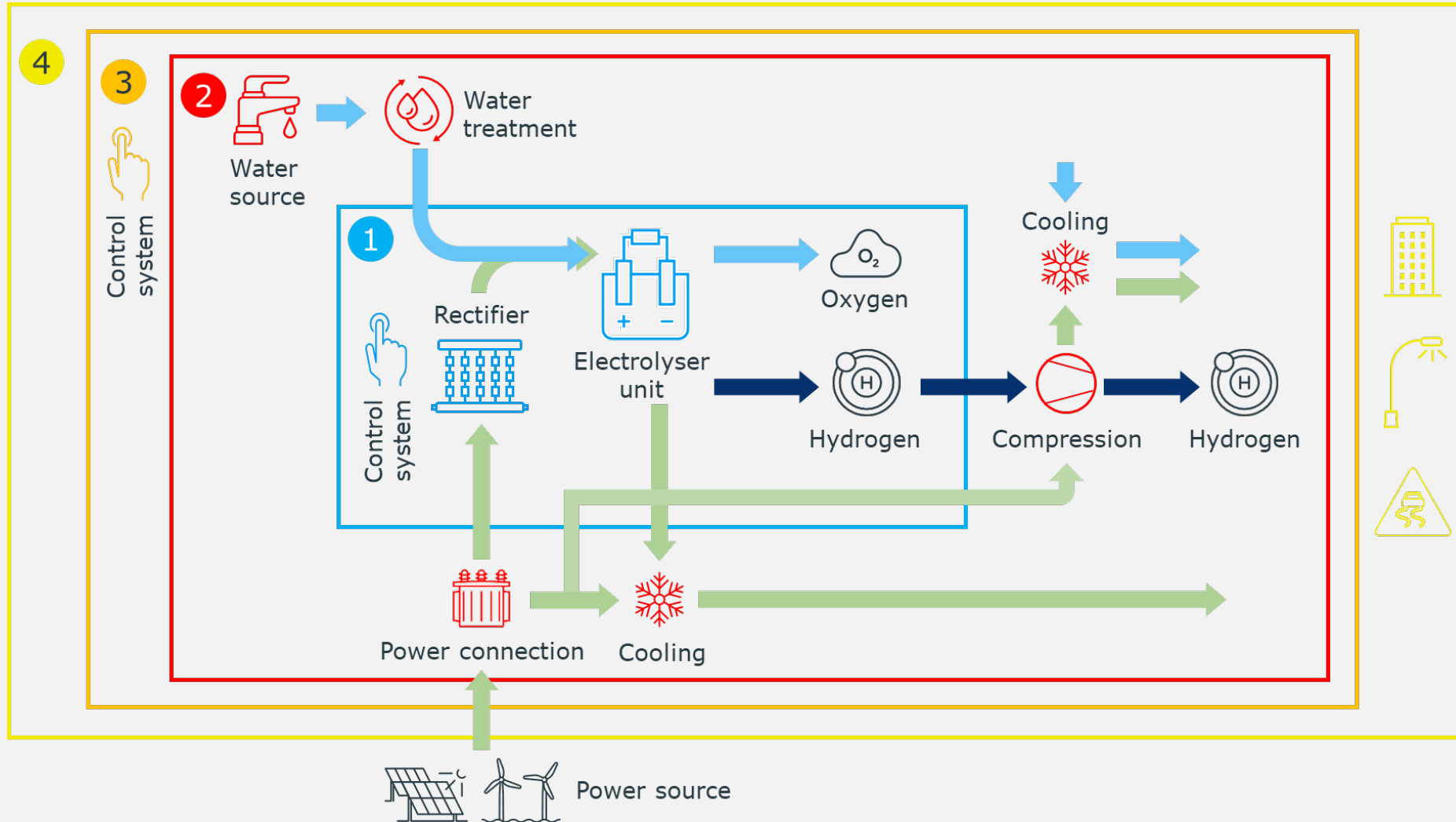
## Our approach

- High-level analysis of potential **global market dynamics** and provided estimates for regional demand, supply, and pricing of e-fuels across various European sectors.
- Assessment of **e-fuel infrastructure** with projected transportation costs.
- **Competitive analysis** of European and global PtX suppliers.

## The result

Identified key strategic market opportunities, giving the client clear insights on where to **focus their strategic efforts** in the European PtX market.

# Hydrogen plant design – 10 MW, 100 MW, and 1 GW, USA



# Flagship ONE – 70 MW e-methanol plant, Sweden

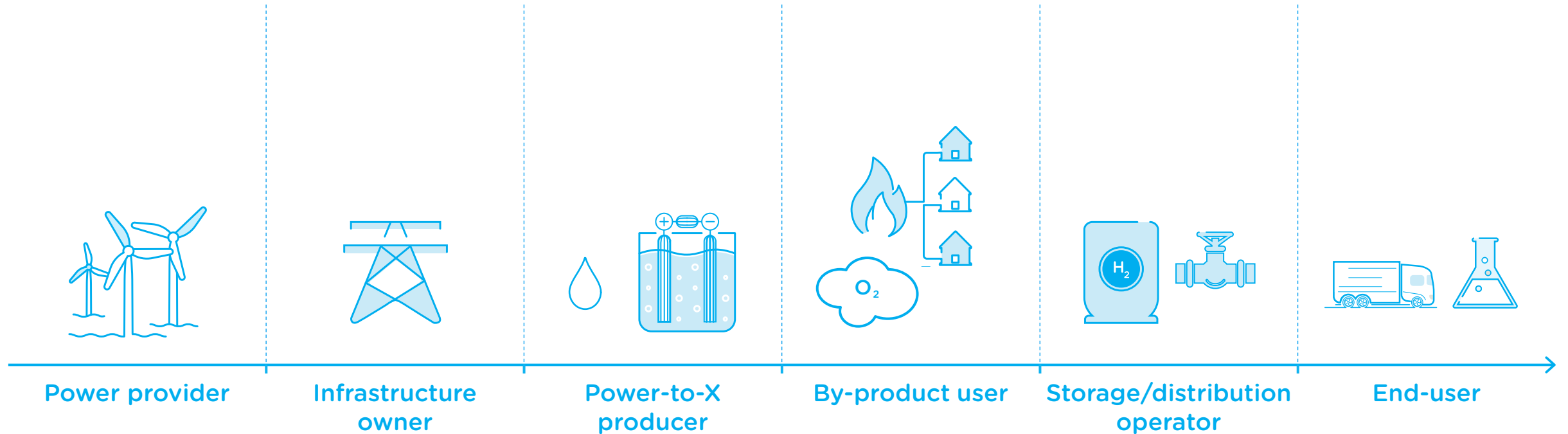


# Project Kristinestad, 200 MW e-methane plant, Finland



# Challenges and good news

# Alignment in time and scale across the value chain is key



# The good news

We need huge amounts of green hydrogen and e-fuels.

We *do* have the technology and solutions to decarbonise before 2030.

The price of this will *only* be 1-4% additional costs for end-users.





# Holistic approach to fighting climate change

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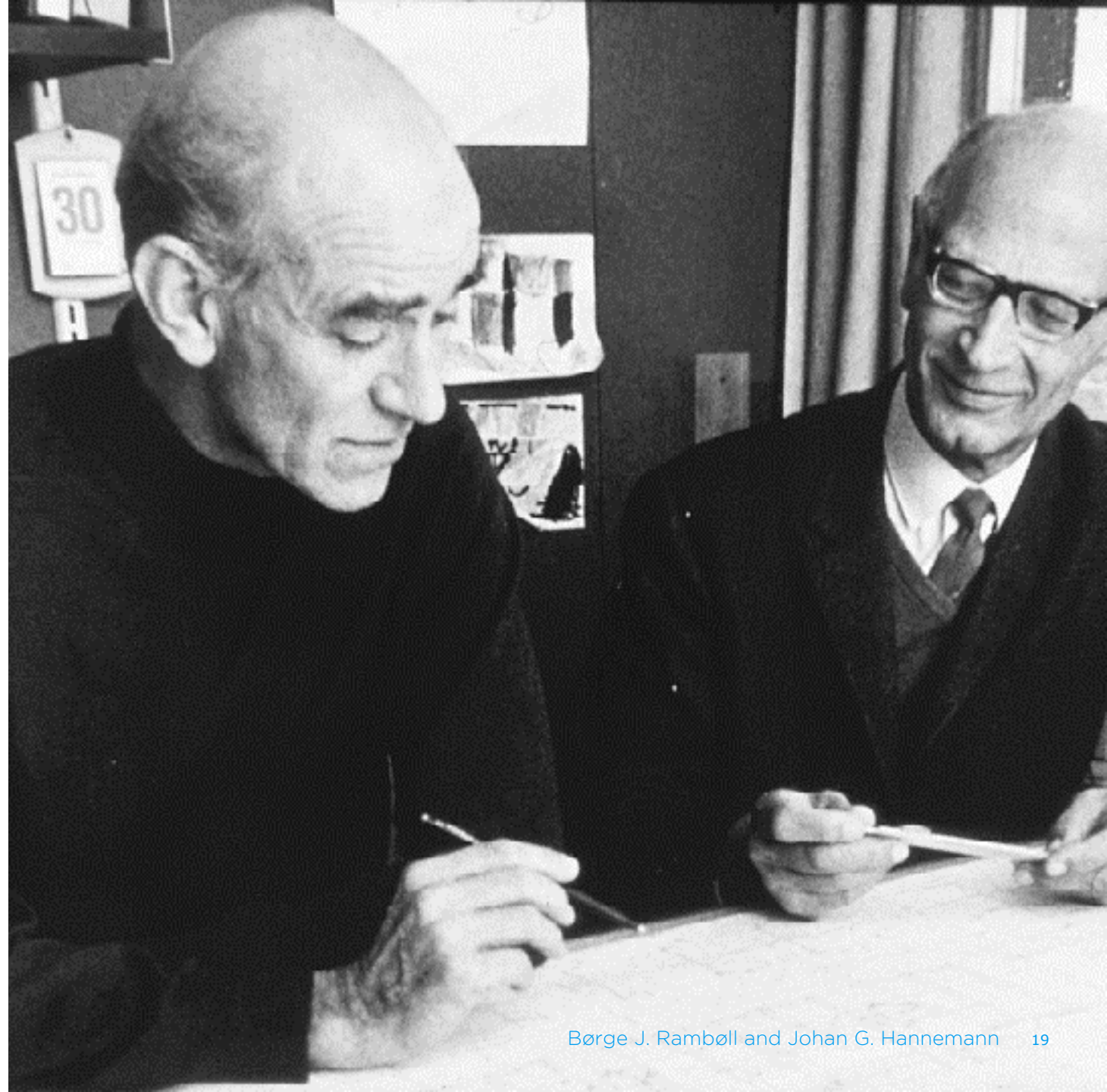
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A bit more about Ramboll

# A strong heritage

- Founded in 1945 in Copenhagen, Denmark
- Founders: Professors Johan G. Hannemann and Børge J. Rambøll
- Talented engineering combined with social visionary aspects
- Strong principles and philosophy



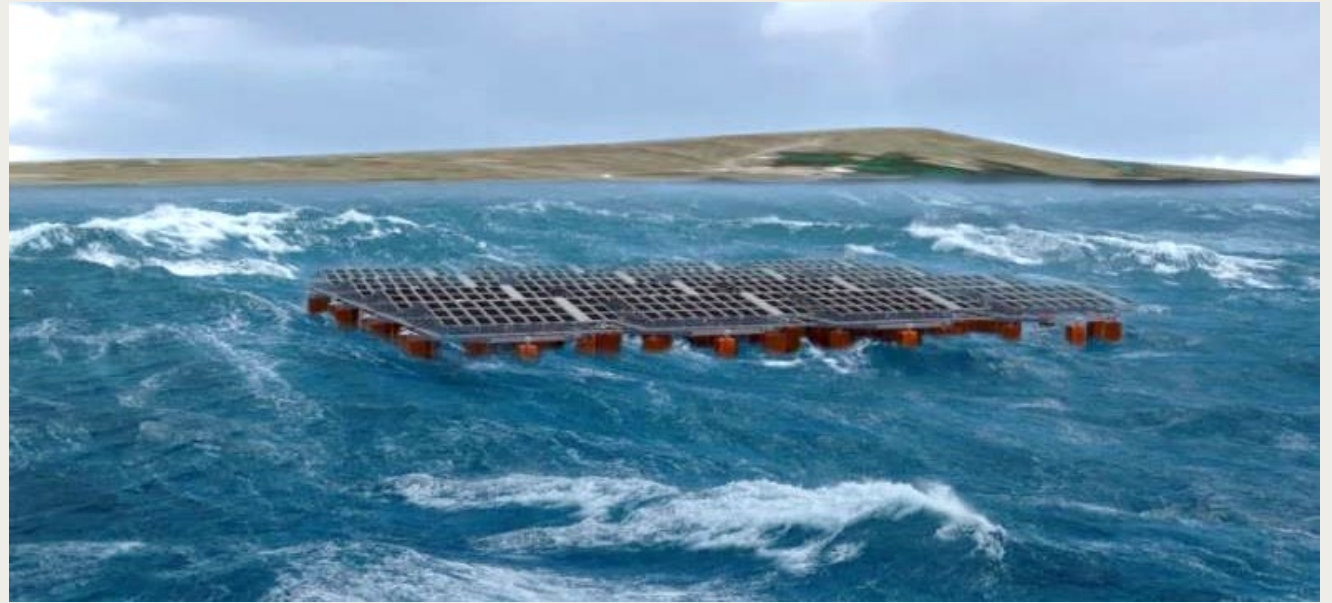
# Energy and sustainability

- 50 years of experience in planning, design and implementation of energy solutions
- Expertise on full spectrum of technologies
- 2,000 specialists
- Top 10 energy consultancies in Europe
- “All in” on sustainability and decarbonisation



# Innovation and cutting-edge technologies

- Master planning of energy island
- Floating solar demonstration
- Offshore hydrogen production
- System integration innovation and sector coupling
- Future energy technologies



## Explore with confidence

- World-class technical expertise on Hydrogen and Power-to-X
- 200 successful hydrogen projects in 2020-2023
- Holistic and multi-disciplinary approach
- Excel in integration of complex systems
- Co-create the best solutions with and for our partners
- Top 100 Innovators in Hydrogen 2023

Decarbonising for net zero

The partner for sustainable change



Thank you!



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