

Hydrogen H₂

RAMBOLL

Bright ideas.
Sustainable change.

Where are the low-hanging fruits: The green hydrogen hierarchy

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H₂ **HYDROGEN POWER**
CLEAN ENERGY OF THE FUTURE





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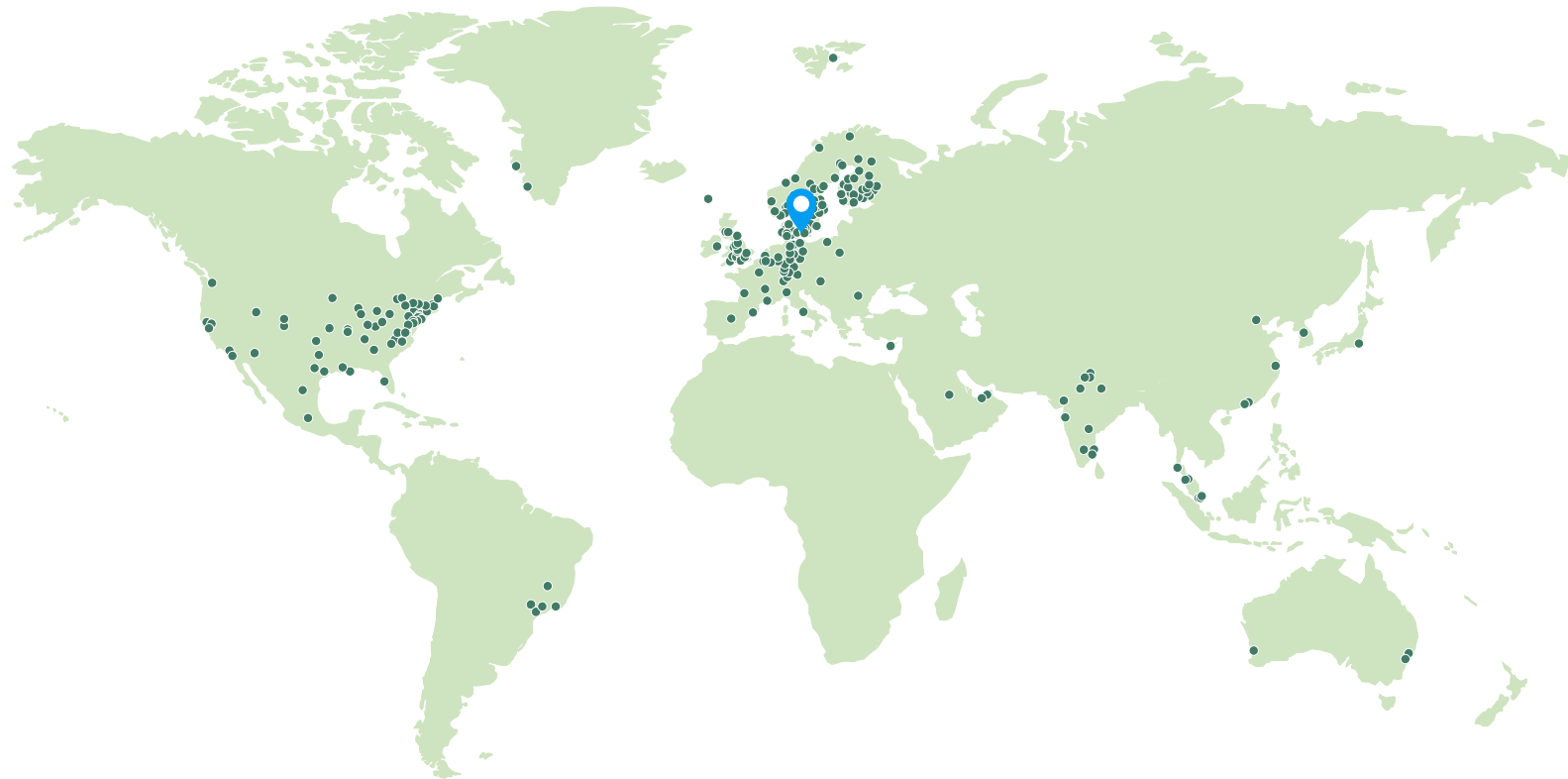
Profile/Background:

- 10+ years of experience in management consulting, strategy and M&A
- Global experience within green transitioning and decarbonization across sectors, mainly energy sector and energy-intensive industries

Ramboll projects/roles:

- Projects related to renewables, PtX, CCUS, Energy infrastructure
- “Thought Leader” within PtX

Ramboll has global presence across nearly 300 offices in 35 countries



● Ramboll Head Office ● Ramboll offices

We are an independent engineering, architecture, and consultancy company founded in Denmark in 1945.

Across the world, Ramboll combines local experience with global, multidisciplinary knowledgebase to create sustainable businesses and societies.

We combine insights with the power to drive positive change to our clients, in the form of ideas that can be realised and implemented.

Sustainability, and supporting the energy transition is at the core of Ramboll's strategic ambitions.

Our mission: **Create sustainable societies where people and nature flourish.**

 300

Global offices in 35 countries

 18,000

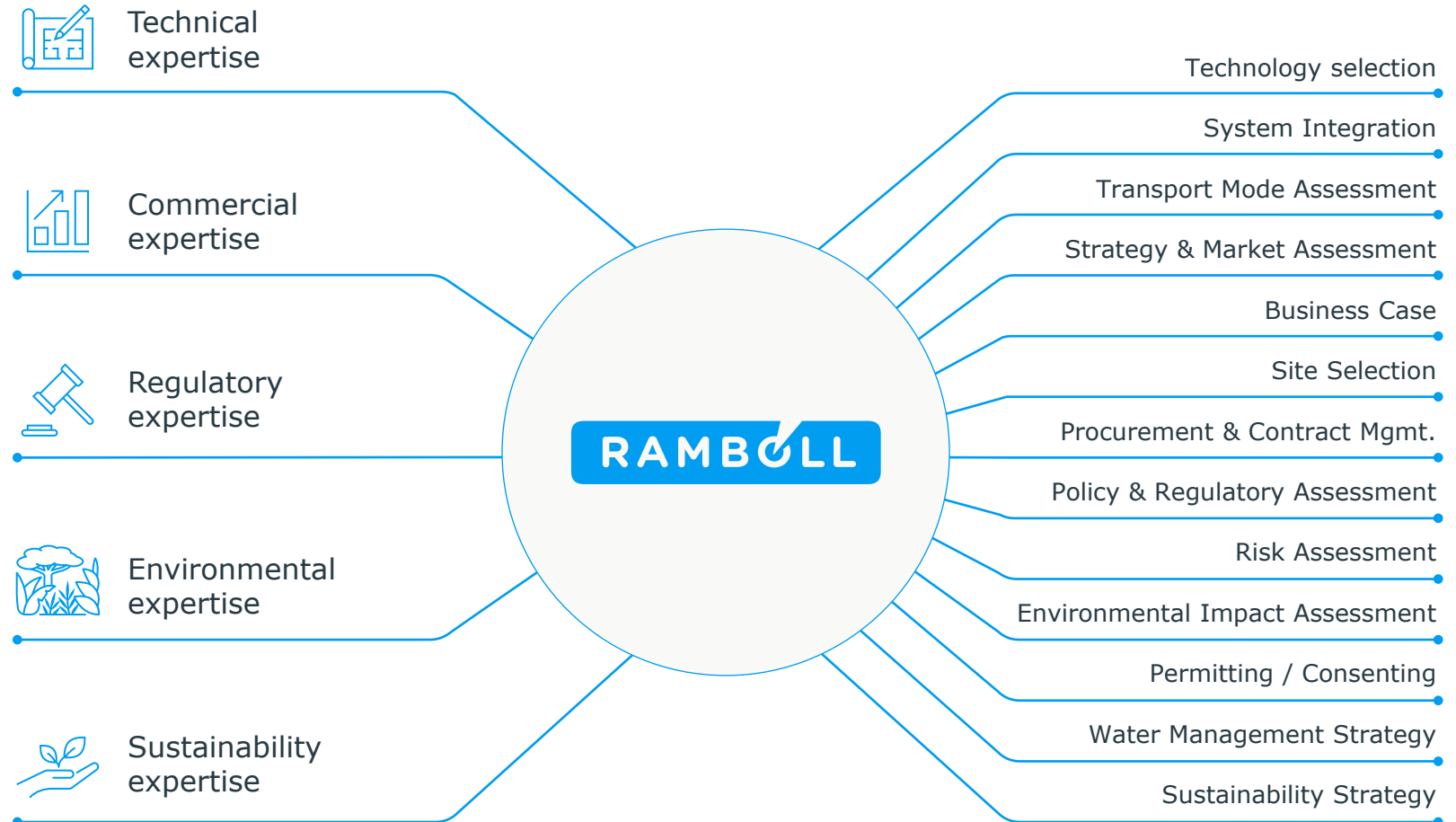
Employees

 2.25B

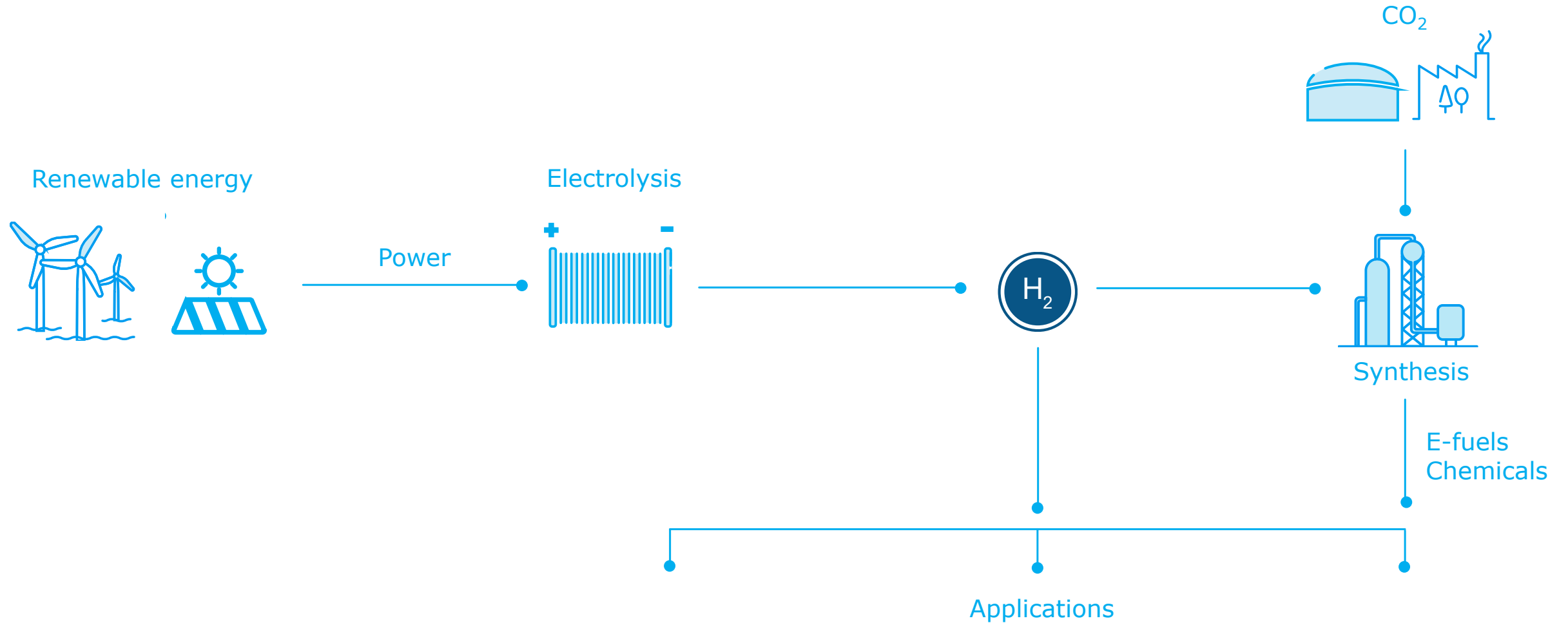
Global revenue, in 2020 across all markets

- Ramboll offers specialized knowledge to clients by covering all phases of a PtX project.
- We work across the entire value chain of sustainable fuels production.
- We are at the forefront of the development of current and future technologies.
- 500+ specialized strategy and management consultants possessing deep commercial expertise on PtX
- Our environmental experts provide support to clients with multimedia and multi-agency permitting and compliance.
- We also cover other aspects of PtX such as water and transport.
- We combine global expertise combined with in-depth market insights and understanding through our strong local presence.

We have comprehensive, multidisciplinary expertise across all PtX aspects



Hydrogen, e-fuels and Power-to-X in short



Hydrogen hierarchy

A photograph of several offshore wind turbines in the ocean. The turbines are white with blue and yellow accents. The sky is a clear, light blue, and the water is a deep blue. In the background, a city skyline is visible on the horizon.

We believe in a holistic approach to fighting climate change

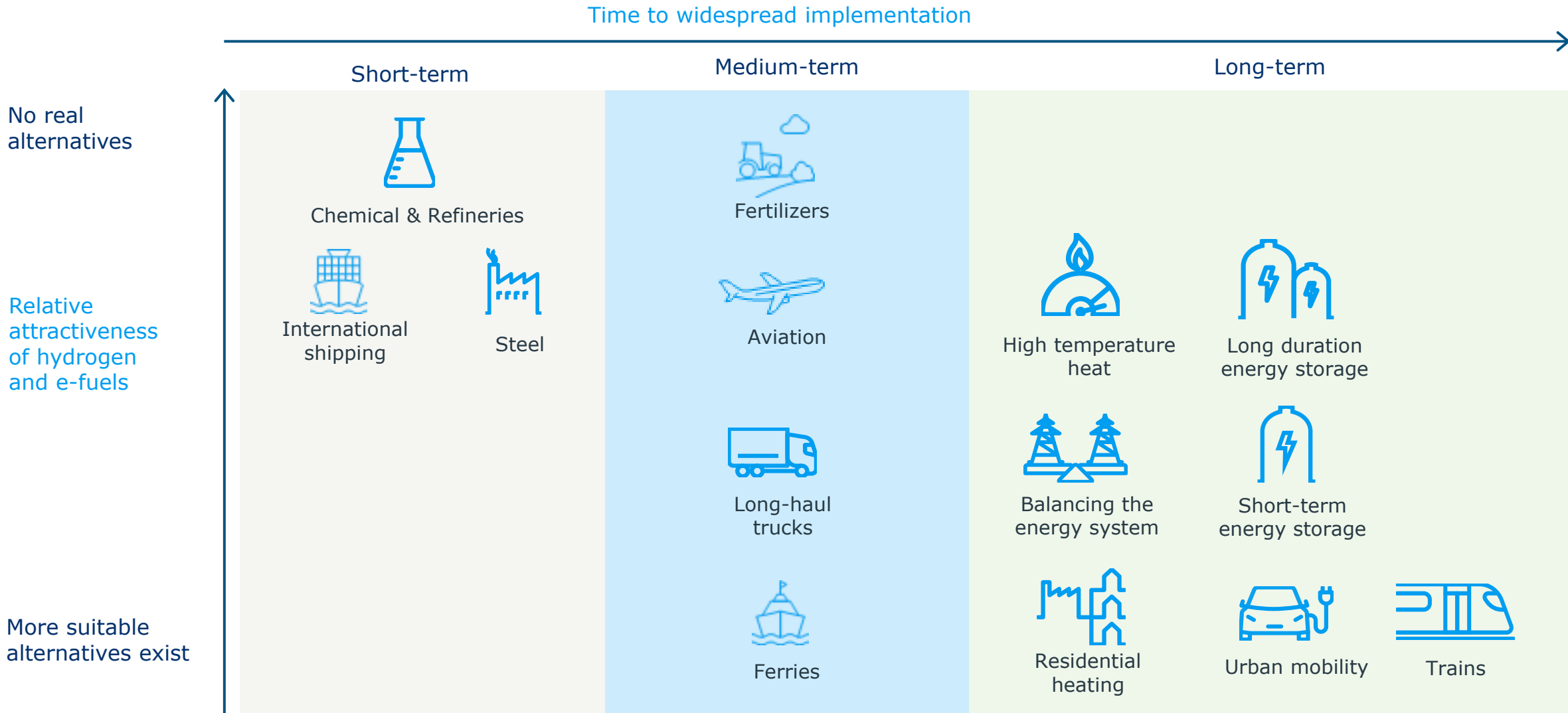
Reduce GHG emissions by

- Reduce energy demand
- Transform the power supply Fossil fuels → Renewable energy
- Only *then*, the green hydrogen and e-fuels will help reduce CO₂ 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



Project examples



Assessment of PtX investment potential in the light of decarbonisation hierarchy and other emerging technologies



The challenge

- An infrastructure investor engaged Ramboll's To enhance their investment strategy and incorporate new technologies related to the clean power transition.



Our approach

- **Comprehensive market analysis** focusing on energy storage and industrial decarbonization, including electrification and Power-to-X (PtX); Covered market and technological maturity, regulatory landscape, market trends, and overall outlook.
- Ramboll **identified and prioritized attractive market opportunities**, ensuring the investment strategy becomes more tangible and relevant for institutional investors.



The result

- Through this project, the client gained a **solid understanding of the opportunities within clean power transition** in Europe and North America. Moreover, Ramboll's analysis identified the most relevant and **attractive opportunity spaces** within these markets, enabling the client to make **informed investment decisions**.



PtX market and regulatory study for the Baltic Region



The challenge

- Client needed a market study to understand the **upcoming European and global markets** for e-fuels and Power-to-X (PtX), and which applications and geographies to prioritise based on their location and local conditions.



Our approach

- Comprehensive analysis of potential **global market dynamics** and **regulatory developments** to forecast future 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 (geographically, products and applications) to **focus their strategic efforts** in the European PtX market.

Thank you!

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