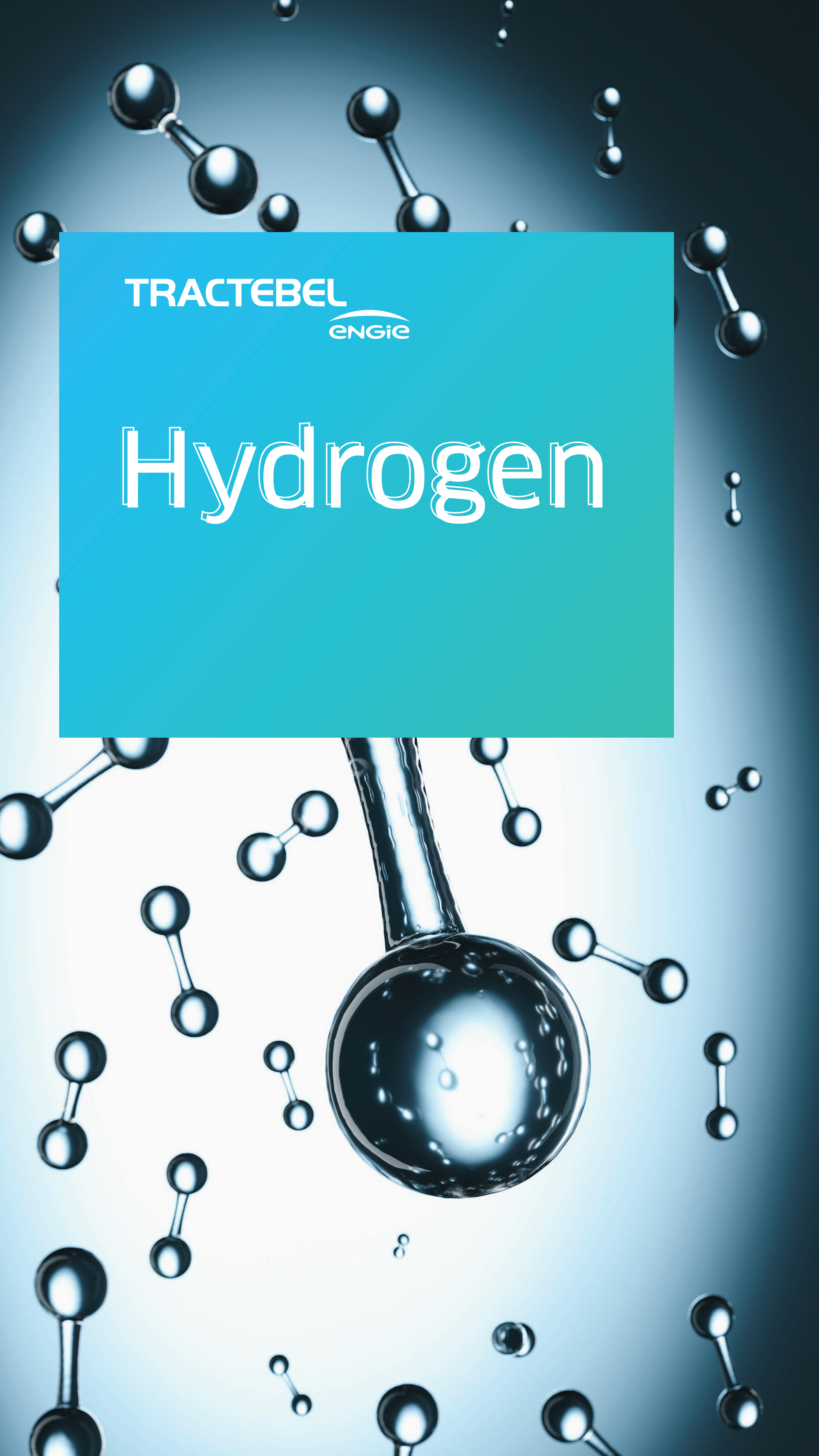


TRACTEBEL
ENGIE

Hydrogen



ENERGY

An integrated and innovative approach to green hydrogen solutions from strategy to operation

With its international, independent and multidisciplinary expertise, Tractebel offers an integrated approach covering all aspects of your green hydrogen projects as Owner's Engineer, Lender's Engineer, Consultant Engineer or Contractor's Engineer.

At the heart of the hydrogen revolution

Leading the energy transition, Tractebel provides a full range of engineering and consulting services to our clients throughout the life cycle of the projects, including design and project management.

For us, hydrogen is a key enabler to decarbonize Industry and transport and a massive energy carrier to manage the intermittency of renewable sources.

We have been working on the development of green hydrogen projects for more than 3 years, covering the entire chain: from production through renewable energy to its final use, either for energy storage, mobility, industry or as raw material for the production of other fuels.

A local player on the global market

On top of our technical strength, we can offer you our local presence in Europe, Latin America, Asia, Australia, etc. As such, we establish project teams which combine long-term experience in project development, assessment, construction and operation with local experts including the specific requirements.

Renewable energy Expertise

- Wind and solar resource assessment
- GIS-supported site selection Layout
- Energy yield calculation including losses
- Electrical expertise
- Electrical (MV/HV) design
- Grid code compliancy and power system
- Grid connection design/studies
- SCADA definition
- Ancillary services

A multidisciplinary approach

Project Management Expertise

- Interface management Risk management
- Planning & cost management
- Contract management
- Quality management
- Document management
- Execution strategy
- Works supervision

Gas process Expertise

- Electrolysis
- Compression
- Gas treatment plants (purification, dehydration, etc.)
- Hydrogen Storage (pressurized, underground)
- Liquefaction
- Pipelines
- Hydrogen refueling station
- Fuel Cells
- Methanation
- Steam Methane Reforming
- Gasification
- Oxygen & Heat management

HSE Expertise

- Environmental Impact assessment
- Safety strategy and concept
- Hazard identification (HAZID),
- Process Safety assessment (HAZOP),
- Quantitative risk assessment (QRA)
- Hazardous area classification

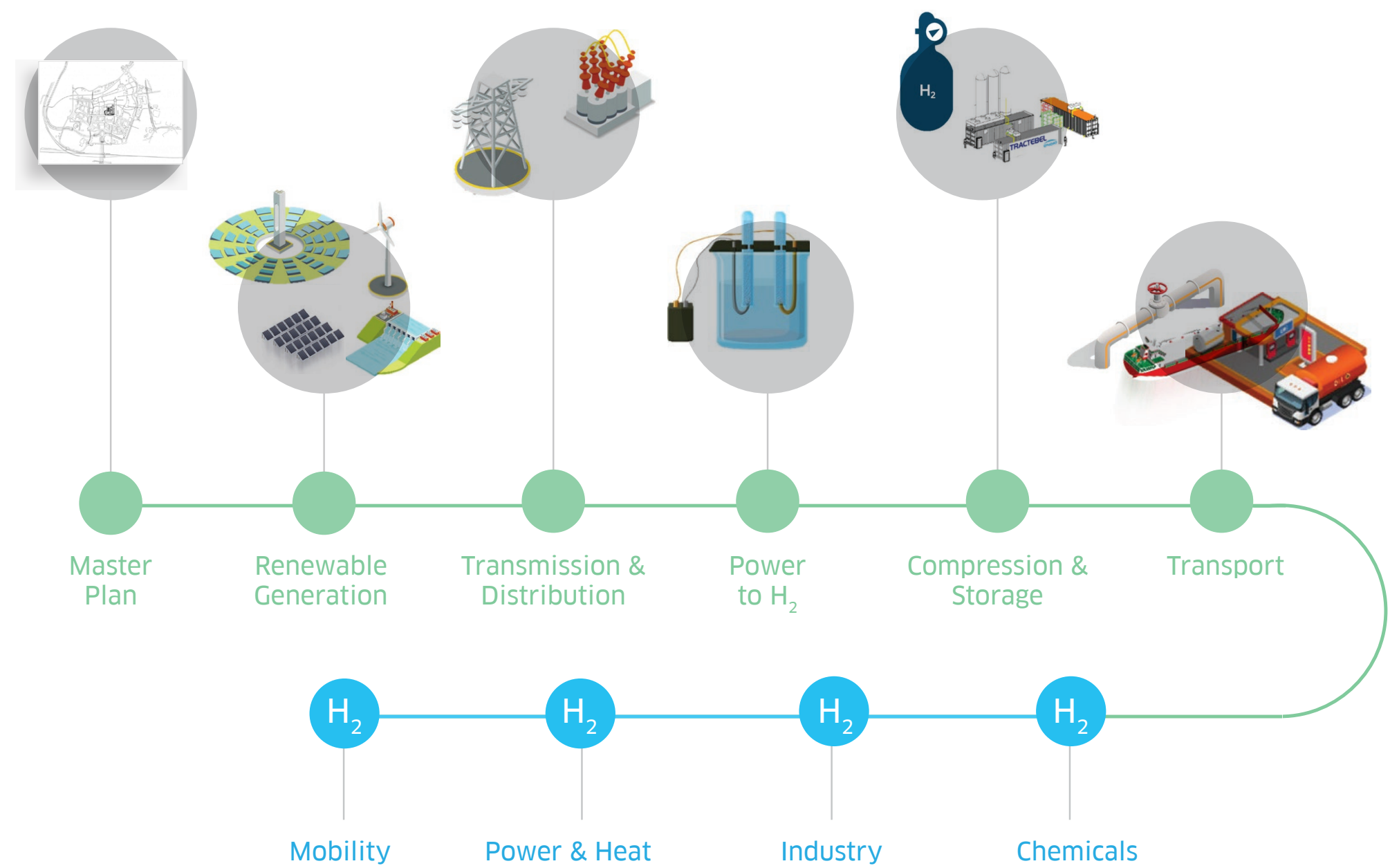
Economics & Finance

- Micro and macro economic modeling
- Taxation and pricing
- Market and project structure
- Contractual strategy



Tractebel has all the competences and state-of-the-art software needed to successfully bring your hydrogen project to life and meet your project goals.

A Renewable Hydrogen Solution Provider



Some References

MOBILITY

Belgium - Revive*, creation and coordination of the consortium: 8 cities and 8 industrial partners. Trial of 15 refuse trucks in their operating environment, compile the evidence base for continued rollout of the technology

France - Zero Emission Valley, EPCM mission for 20 hydrogen refueling stations for various kind of vehicles

Chile - Rhino mining Transport Decarbonization, a proof of concept of the H₂ supply chain and one retrofitted truck before scaling up the whole fleet of 40 trucks

POWER & HEAT

Australia - Boomerang, feasibility of PV-batteries-hydrogen power plant

Singapore - REIDS, micro-grid on island, pre-feasibility and implementation of renewable energy integration demonstrator

INDUSTRY

The Netherlands - HyNetherlands,

future large scale green hydrogen production at Eemshaven

France - Green hydrogen for food industry, feasibility study for the development of green hydrogen supply via on-site electrolysis for a batch process

CHEMICALS

Chile - HyEx, pre-feasibility study for green ammonia production from renewable hydrogen

Australia - Yuri, pre-feasibility and feasibility study for the development of green hydrogen production for ammonia plant

France - Power to Methane, EPCM missions for two Power to Methane pilot projects combining CO₂ from AD plant and green hydrogen from renewables. Two different methanation technologies will be installed



ENGiE