

Introducing

tde energy

delivering

**technology
for**

clean and affordable energy

becoming

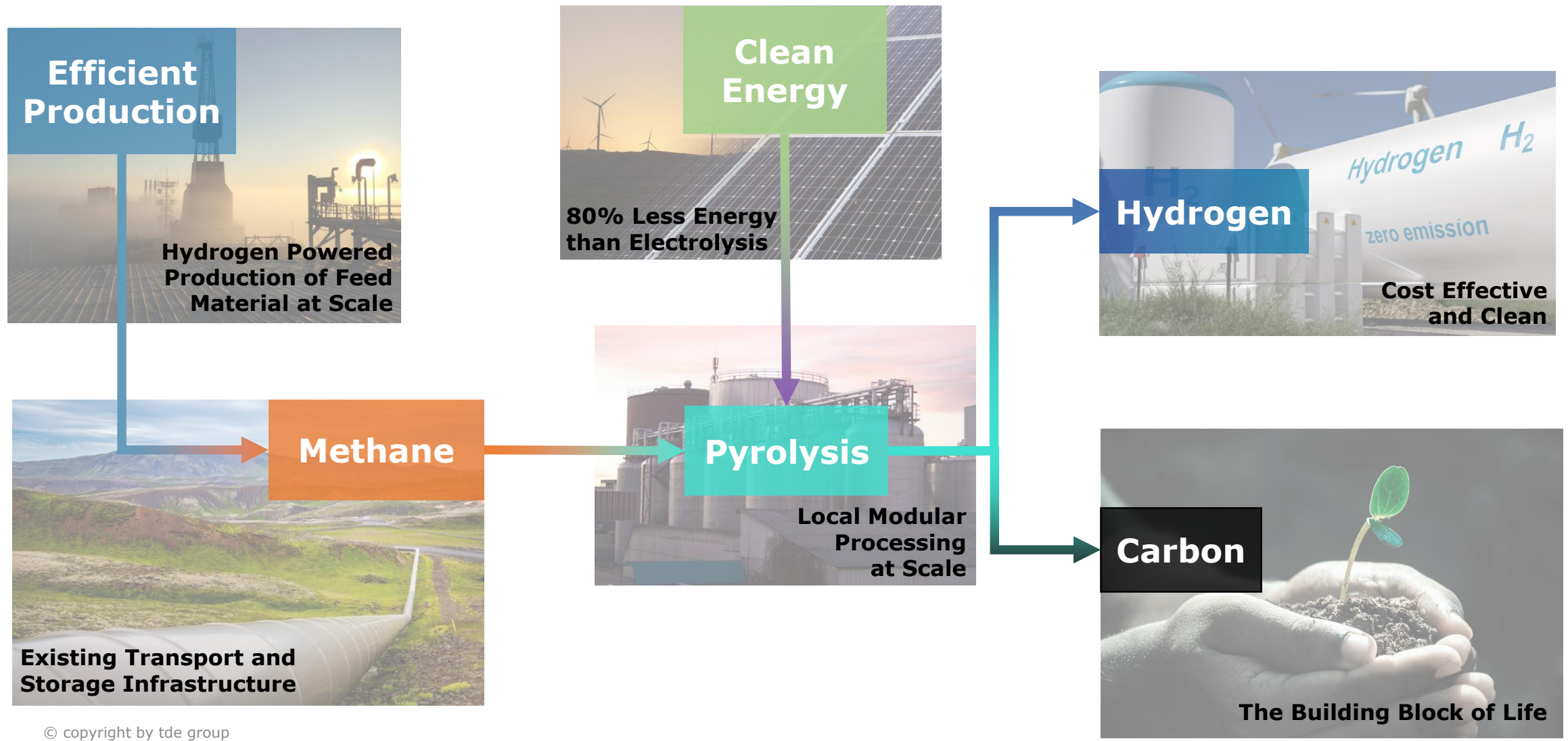
**a leading hydrogen and carbon
technology provider**





tde energy Technology Summary

Clean and affordable energy for the world



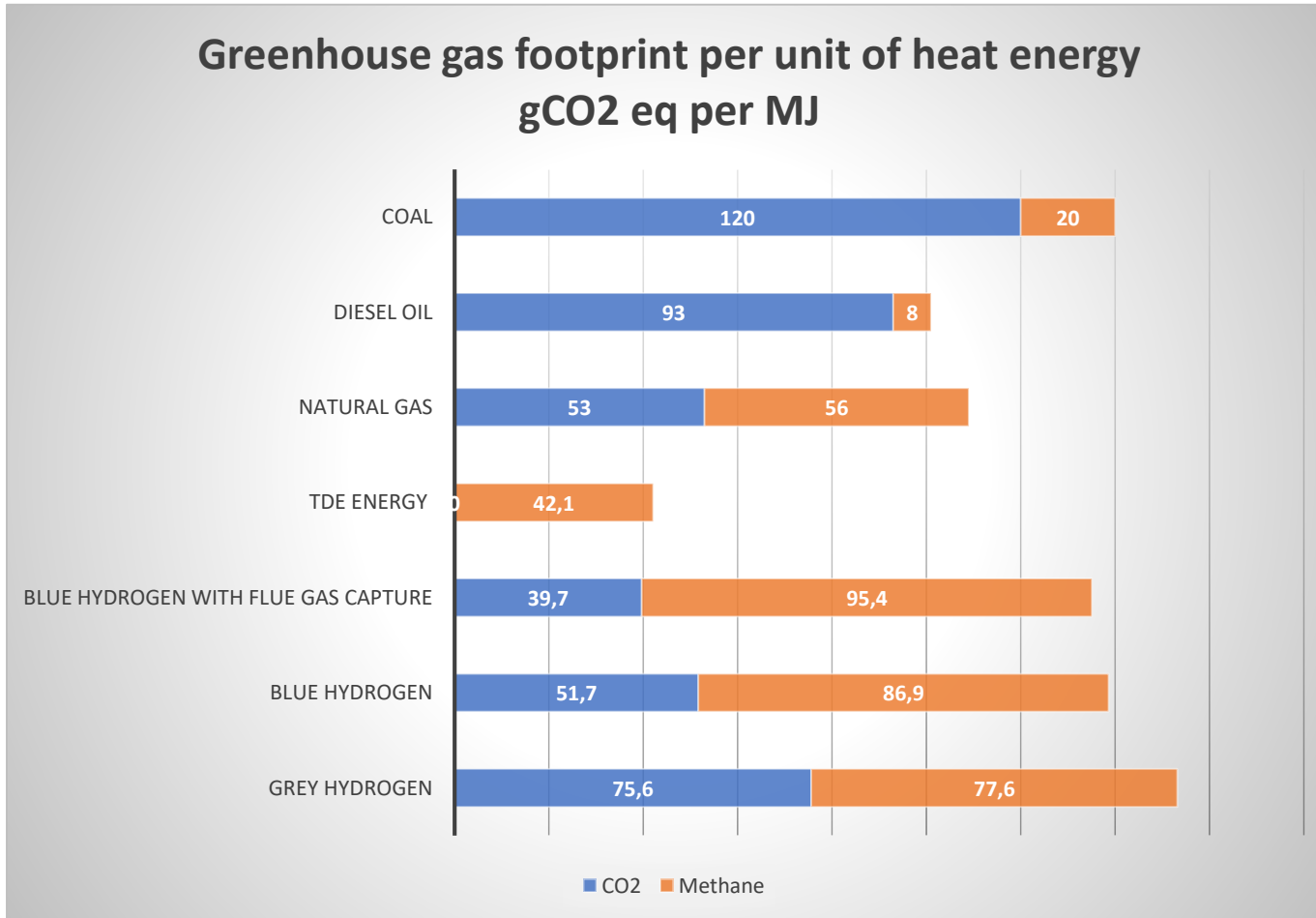
Global hydrogen technology objectives

A sustainable path to scalable energy supply

- **Supplying the heavy industry** with **CO₂ neutral** and **affordable** hydrogen at industrial scale
- **Utilize existing** natural gas infrastructure
- **Utilize carbon** – the building block of life – as valuable secondary raw material
- **Water free** – no water is needed
- **Low energy** – only 20% percent of energy demand compared to other hydrogen processes

Hydrogen and carbon technology

Carbon footprint of pyrolysis in comparison



Note:

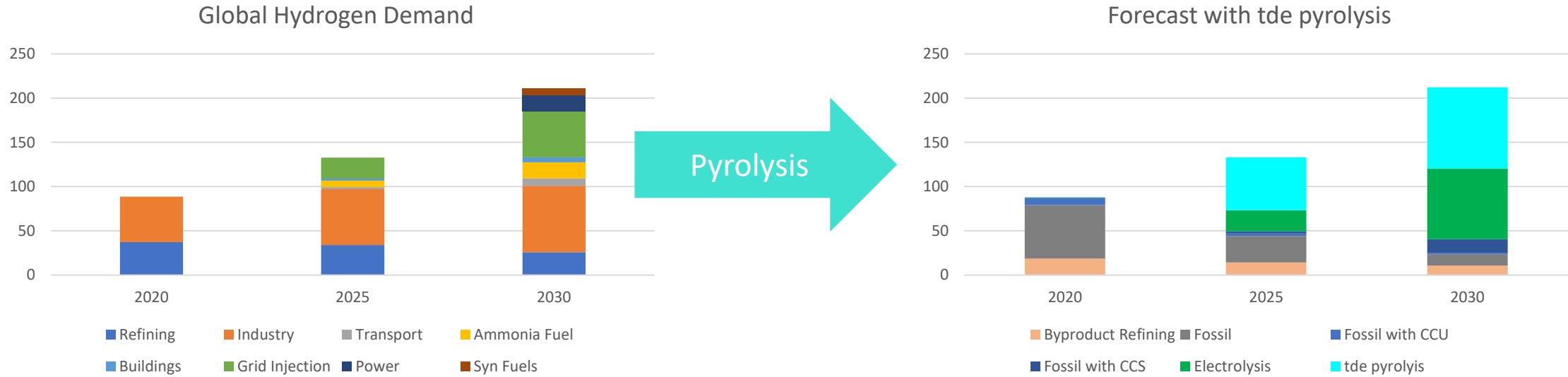
- **tde energy** process driven by green energy
- **tde energy** process demands lower temperature compared to other pyrolysis processes resulting in lower emission

<https://doi.org/10.1002/ese3.956>

„Green House Gases Comparison Worst Case Scenario“, after Horwarth et al.“

hydrogen and carbon technology

Rapid disruption of hydrogen market by **tde energy**



- Expected use profile of hydrogen generated by **tde energy** is **well aligned with sector usage**
- Pyrolysis replaces hydrogen production in industrialized sectors such as industry, fertilizer production and refining. These sector have already **an existing network** (infrastructure, gas connection etc.)
- Pyrolysis facilitates fast **decarbonization in otherwise “difficult to decarbonize”** sectors.

Product Development and Investment Roadmap

Modular production units at industrial scale

2021: 1kg/h

Process concept
Laboratory scale testing
Carbon utilization concepts

2022-25:

Pilot: 10kg/h to 100 kg/h

Pilot pyrolysis plant
Mass and energy balances
Material streams
Gas separation and treatment

2023-25:

Industrial Module 1,000kg/h

Upscaling of pilot module
Continuous process established
Planning of industrial manufacturing of modules

Large carbon utilization demonstration

Carbon delivery contracts secured

2026:

Plant >94,600 tons/year (12 modules)

Modular industrial plant in operation
Upscaling to industrial plant completed
Role out of technology to large scale market

Hydrogen and carbon technology contracts operating