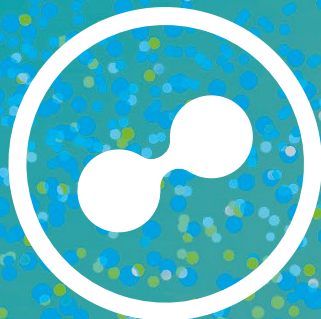




S I N G L E

Producing hydrogen
in one single step



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The problem

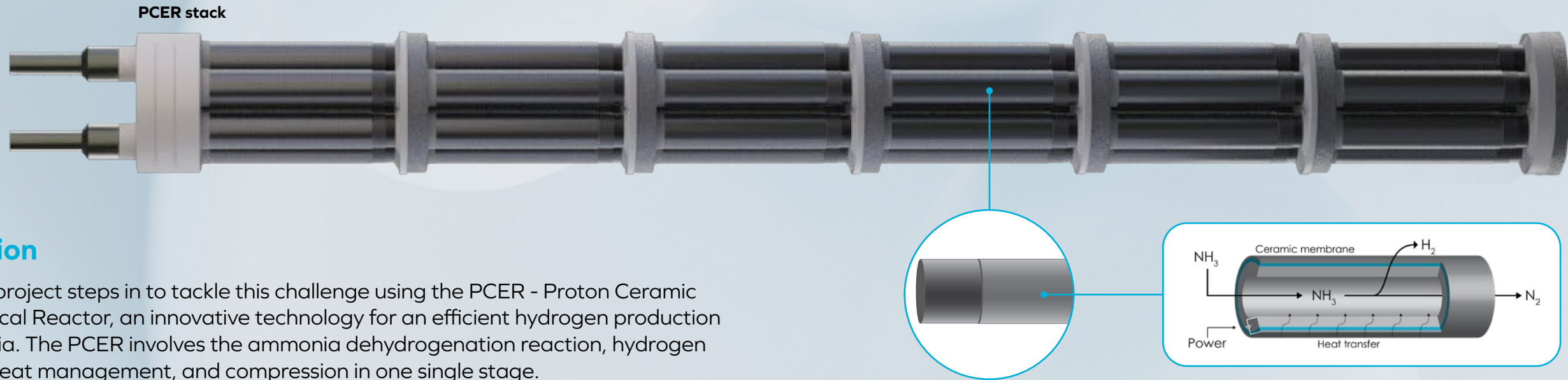
Hydrogen, due to its physical features, requires a reliable carrier for transportation and storage, with ammonia's hydrogen-rich composition offering a promising solution. However, the hydrogen extraction process from ammonia involves energy-intensive steps, challenging the efficiency for hydrogen production.

The project

SINGLE aims to showcase the competitive advantages of PCERs in the direct production of high-purity, pressurized hydrogen (up to 20 bar) from ammonia. This goal will be achieved through the implementation of an innovative PCER stack design integrated into a module capable of operating at a scale of 10 kg H₂/day. To reach this capacity the module will comprise 20 individual stacks.

The solution

The SINGLE project steps in to tackle this challenge using the PCER - Proton Ceramic Electrochemical Reactor, an innovative technology for an efficient hydrogen production from ammonia. The PCER involves the ammonia dehydrogenation reaction, hydrogen separation, heat management, and compression in one single stage.





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 SINGLE H2 PROJECT

To reach the project's goals, SINGLE will:

- ▶ Optimize the PCER catalytic activity for ammonia dehydrogenation
- ▶ Optimize and qualify PCER stacks and system components
- ▶ Fabricate PCER stacks
- ▶ Design, assembly, construct, and test the 10 kg H₂/day module
- ▶ Assess the life cycle, value chain economics and critical raw materials
- ▶ Carry on dissemination, communication and standardization activities



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