Shell Hydrogen – The Evolving Story

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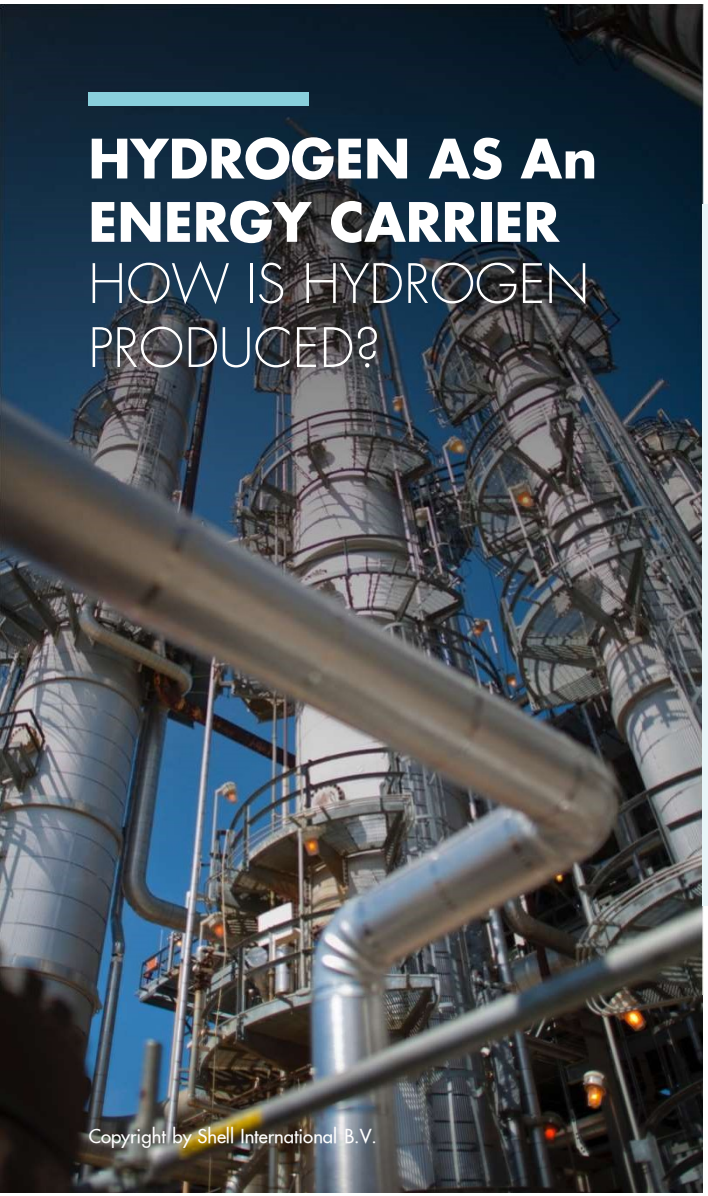
THE SHELL HYDROGEN JOURNEY



HYDROGEN AS An ENERGY CARRIER
HOW IS HYDROGEN PRODUCED?

Hydrogen can be produced by

Natural gas reforming

Methane can be converted into hydrogen.

Gasification

Hydrogen can be made from organic materials like agricultural waste.

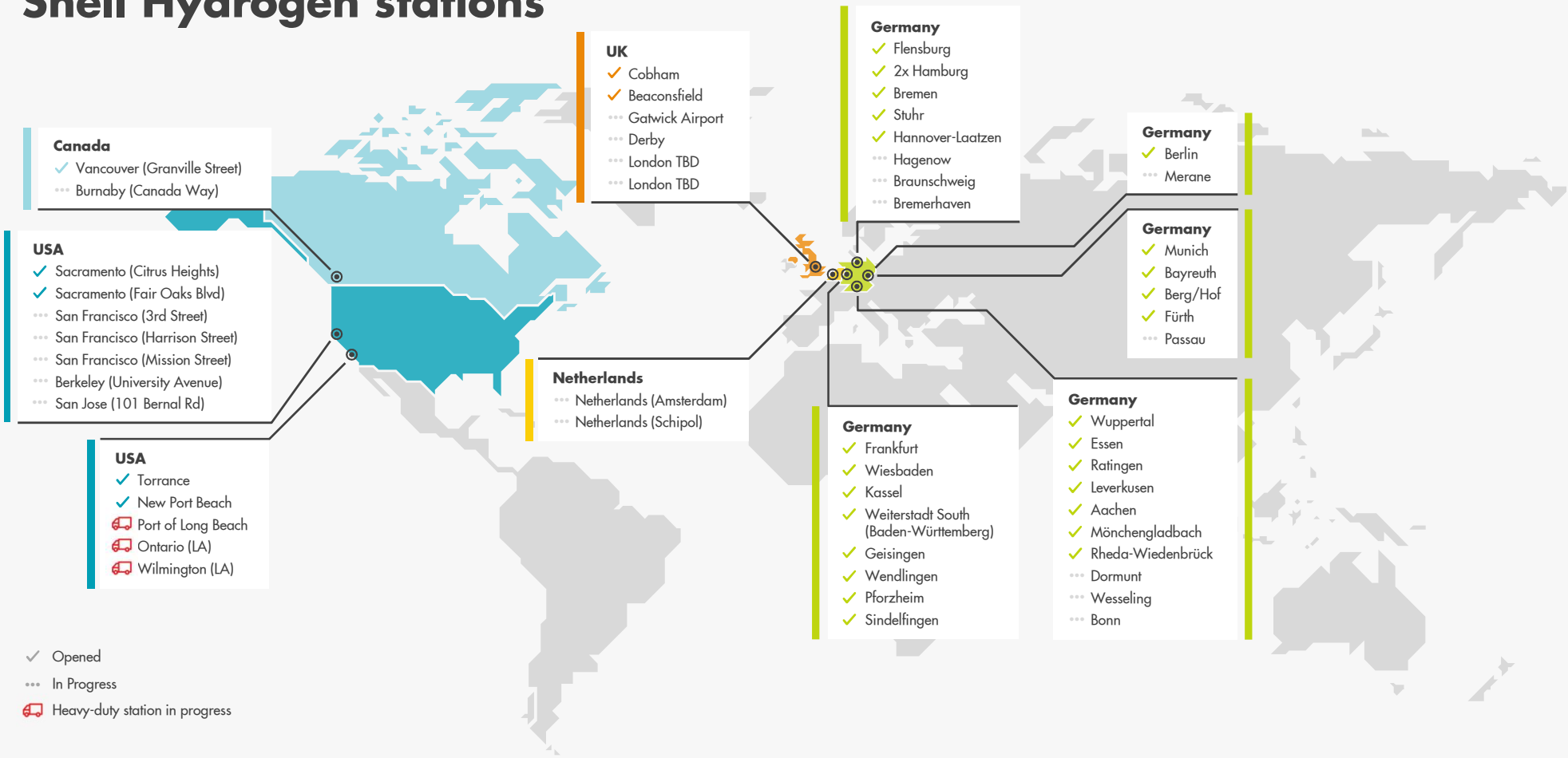
Electrolysis

Splitting water with electricity releases hydrogen and oxygen.

+ Methane from biogas

+ Electricity from renewable sources

Shell Hydrogen stations




COLLABORATION IS
KEY FOR H2 SUCCESS

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The future success of hydrogen as a sustainable transport option will require actions by all players

Car manufacturers

to continue developing hydrogen fuel cell vehicles and reduce costs

Governments

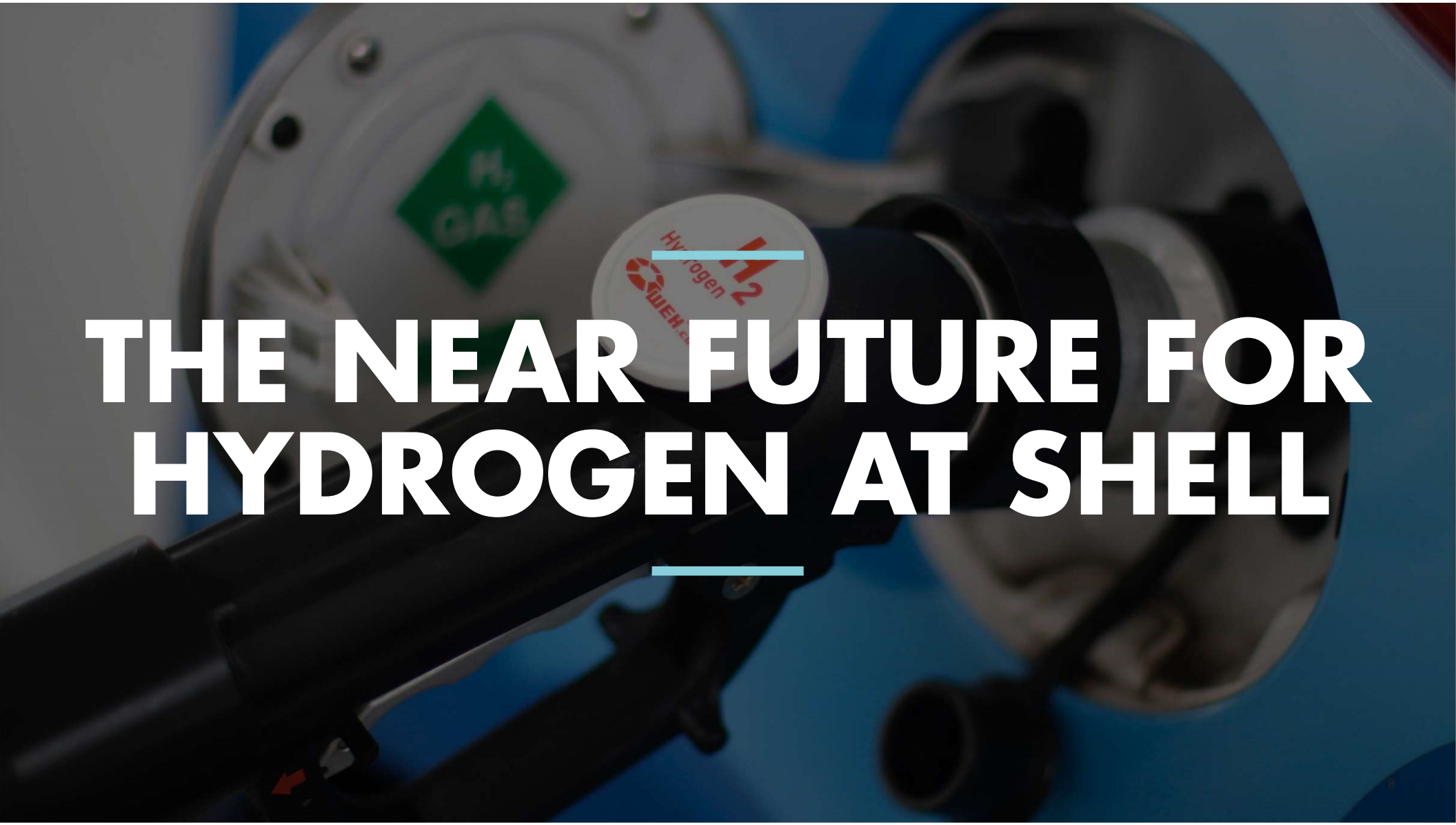
to support the choice for hydrogen fuel cell vehicles

Customers

will require greater hydrogen infrastructure and more hydrogen car models to choose from

Energy industry

to invest in infrastructure and offer fuel at competitive price



THE NEAR FUTURE FOR HYDROGEN AT SHELL

REFHYNE
BUILDING A 10MW PEM ELECTROLYSER

At present, ITM are building a 10-megawatt PEM (polymer electrolyte membrane) electrolyser, the largest of its kind, to produce hydrogen at the Rhineland refinery in Germany.

REFHYNE
CLEAN REFINERY HYDROGEN FOR EUROPE

This project is supported by the European Union.

HYDROGEN AS AN ENERGY CARRIER

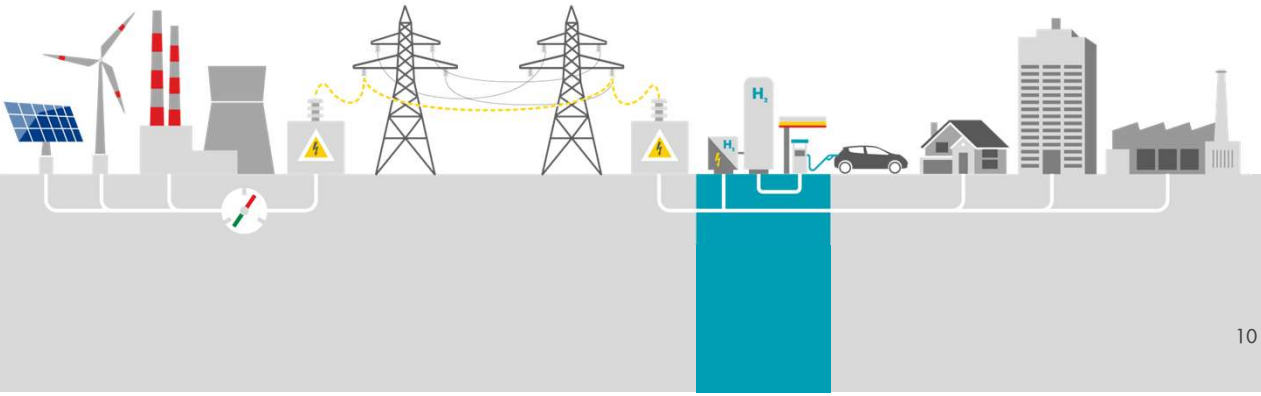
CO_2 reduction

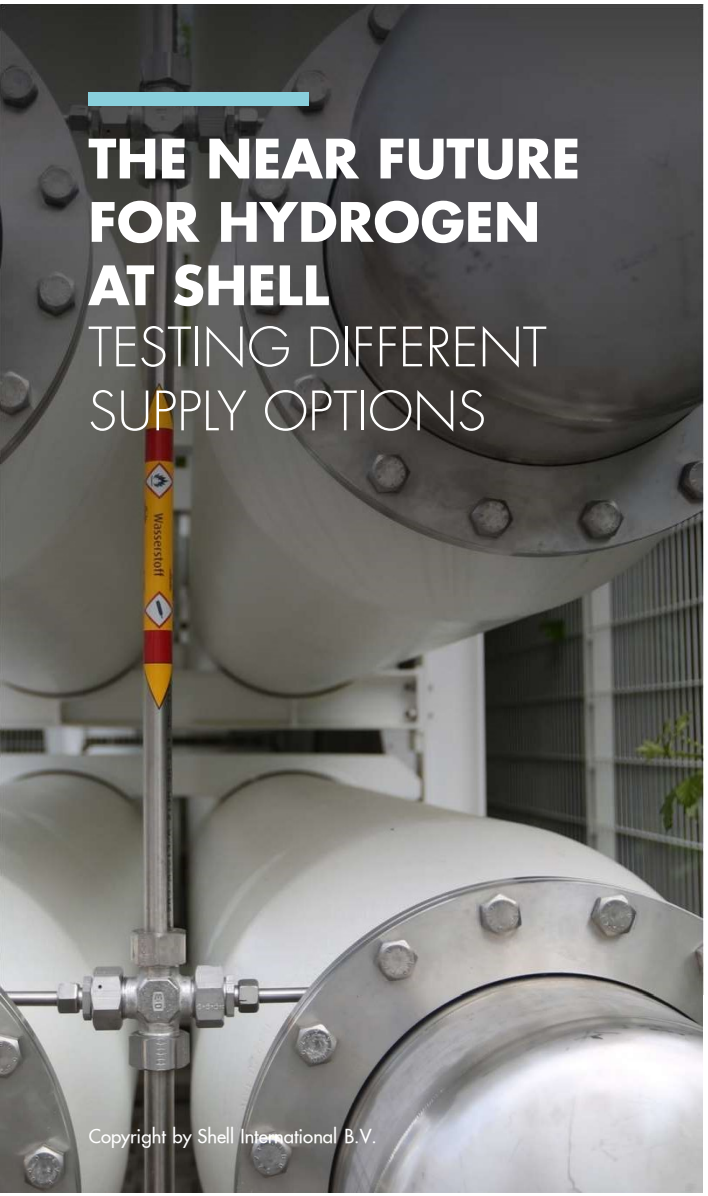
Hydrogen can be made with electricity from renewable sources or using biogas.

Hydrogen can help balancing the electricity grid

The production of hydrogen can enable the use of electricity which would otherwise be lost to be stored and used either in mobility, industrial or domestic applications.

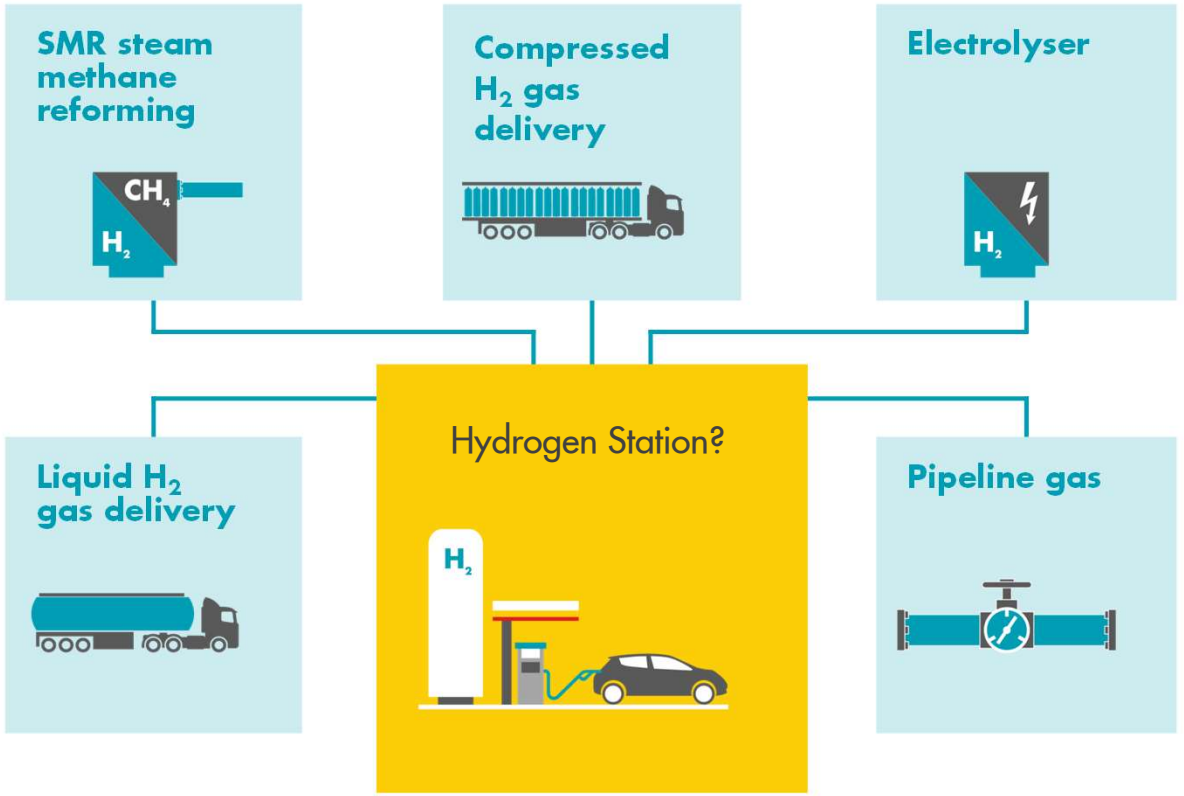
This helps to optimise the power markets and balance the intermittencies brought about by the introduction of more electricity from renewable sources.





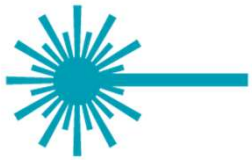
THE NEAR FUTURE FOR HYDROGEN AT SHELL

TESTING DIFFERENT SUPPLY OPTIONS

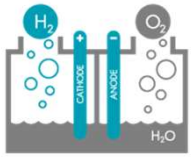


THE NEAR FUTURE FOR HYDROGEN AT SHELL

HYDROGEN RESEARCH & DEVELOPMENT

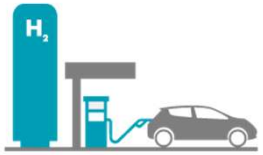


Quality control



Electrolysis

CH2P



H_2 dispensing

Developing other aspects of the value chain, e.g. wind to hydrogen + Leader in establishing standards for safe dispensing