

The Hydrogen Potential

7th February 2018



About Kawasaki Heavy Industries



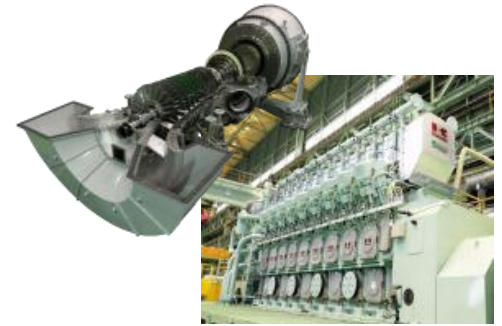
Ships/Marine



Rolling stock



Aerospace



**Gas Turbine/
Machinery**



Plants/Environment



Precision Machinery



Motorcycles and Engines

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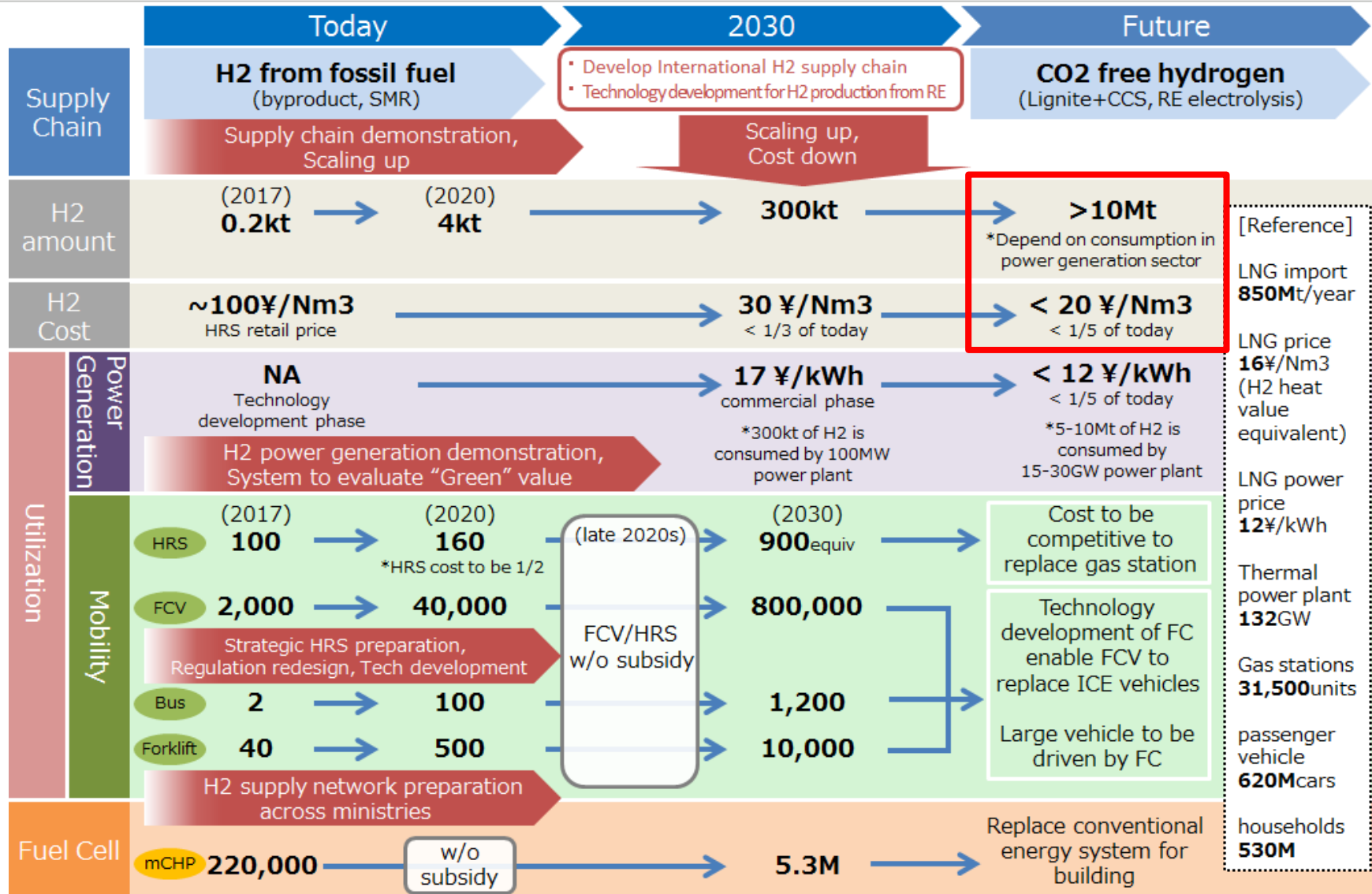
The Japanese hydrogen society (1/2)



- Cabinet decision for “Strategic Energy Plan” in April 2014.
- METI formulated Strategic Roadmap for Hydrogen / Fuel cell in June 2014.
- Prime Minister Abe declared technological development of **hydrogen production, storage and transportation** towards realizing CO₂-free societies at the COP21 Leaders Summit in December 2015.

Source : Ministry of Foreign Affair web site Dec 2015

Basic Hydrogen Strategy (Dec 2017)



Source : METI Basic Hydrogen Strategy Dec 2017

The hydrogen potential (1/2)

The hydrogen vision in the world is...



The hydrogen vision would achieve 20% of the required CO2 reductions by 2050.

*GT = Gigatonnes

Source: Hydrogen Council *Hydrogen Scaling Up* Nov 2017

The hydrogen potential (2/2)

The Hydrogen Council

- **Establishment** : January 2017 (1st CEO meeting in Davos)
- **Mission** : Global initiative of leading energy, transport and industry companies with a united vision and long-term ambition for hydrogen to foster the energy transition
- **Focus** : 1) Provide long-term and stable policy frameworks. 2) Develop coordination and incentive policies. 3) Facilitate harmonization of industry standards
- **Members investment plan** : c. \$2.7 billion per year



Source: Hydrogen Council web site Jan 2018

Hydrogen uses



Power generation



Power Generation



Distribute energy across sectors and regions



Pipeline



Act as a buffer to increase system resilience



Help decarbonize transportation



Fuel Cell Train



Refueling Station



Fuel Cell Vehicle



Fuel Cell Truck



Fuel Cell Forklift



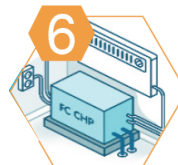
Help decarbonize industrial energy use



Iron / Steel



Cement



Help decarbonize building heat and power



Static Fuel Cell



Serve as renewable feedstock for industrial use



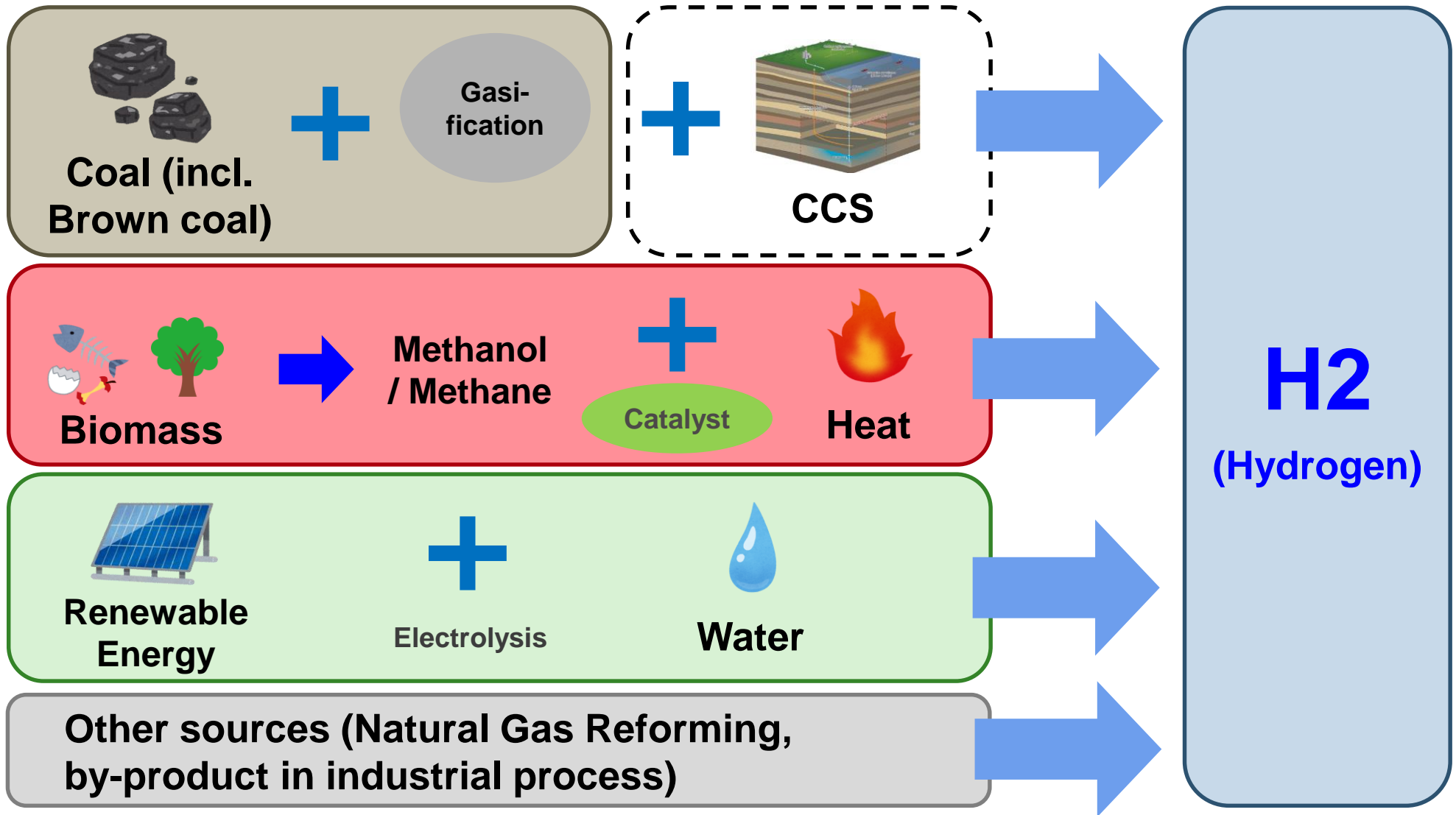
Oil Refinery



Chemicals

Picture Source : Hydrogen Council, CO2CRC, Toyota, Linde, Nikola, Alstom, Tokyo-gas, Cosmo Eng., Teijin Eng., Kobe-Steel, Mitsubishi Material

Hydrogen production



Source: NEDO hydrogen energy white paper , Apr 2017

The opportunity for Australia

- Australia has big potential for leading hydrogen society in the world given abundant resources such as brown coal.
- There is potential for significant economic growth and job creation in the Latrobe Valley with new hydrogen related industries.



Thank you

Kawasaki, working as one for the good of the planet

“Global Kawasaki”

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