MHI Group Capabilities around Hydrogen

The MHI Group has a vast range of technologies and end-to-end solutions for hydrogen value chain

Production

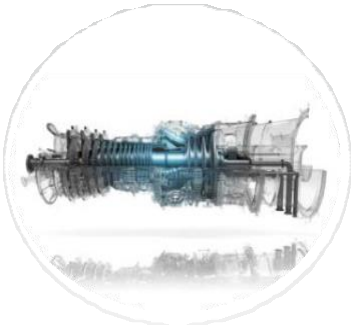
Gasification Plants

CO_2 Capture Plants

Transportation

Ammonia & Methanol Co-production Plants

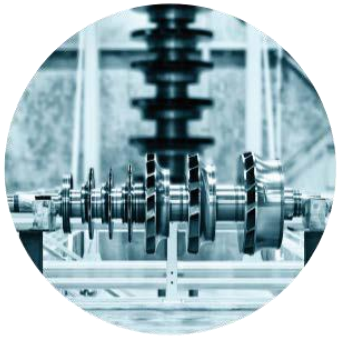
Demand



Hydrogen Gas Turbines

Hybrid Fuel Cell

Offshore Wind Turbines



Compressors/Pump

Gas Carriers

Steel Making (DRI Process)

Hydrogen Gas Engine

Rocket

Expanding this value chain by R&D activities and partnership initiative

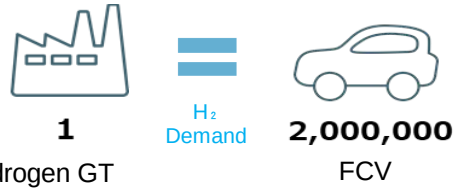
Hydrogen Power Generation

World‘s most advanced Hydrogen combustion technology

Hydrogen GT

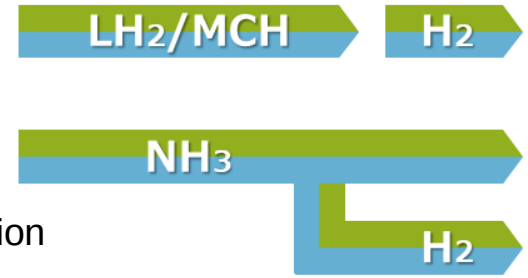
- **Saving Investment Costs**
  Can be applied to existing power plant facilities with minimum modifications

- **Stimulate Large-scale Hydrogen Demand**
  Expansion of hydrogen supply chain and reduction of costs



- **Carrier Flexibility**
  Low purity hydrogen is usable and can be transported with any carrier

- **Power Output range**
  40 – 430 MW (60 Hz)



- **Timeline**
  2018 Achieve 30% H_2 Co-combustion
  2025 Achieve 100% H_2 Combustion

Fuel Cell (SOFC)

- Multi-fuel capability (hydrogen, natural gas biogas, etc.)
- Rated Output：200kW～1MW
- Power Generation Efficiency: 53%
- Overall Efficiency: 73%（when supplying hot water）
- Can be applied to SOEC (hydrogen production)

Hydrogen Flagship Projects

MHI group has been actively developing Green and Blue Hydrogen/Ammonia projects in US, Europe and Asia Pacific

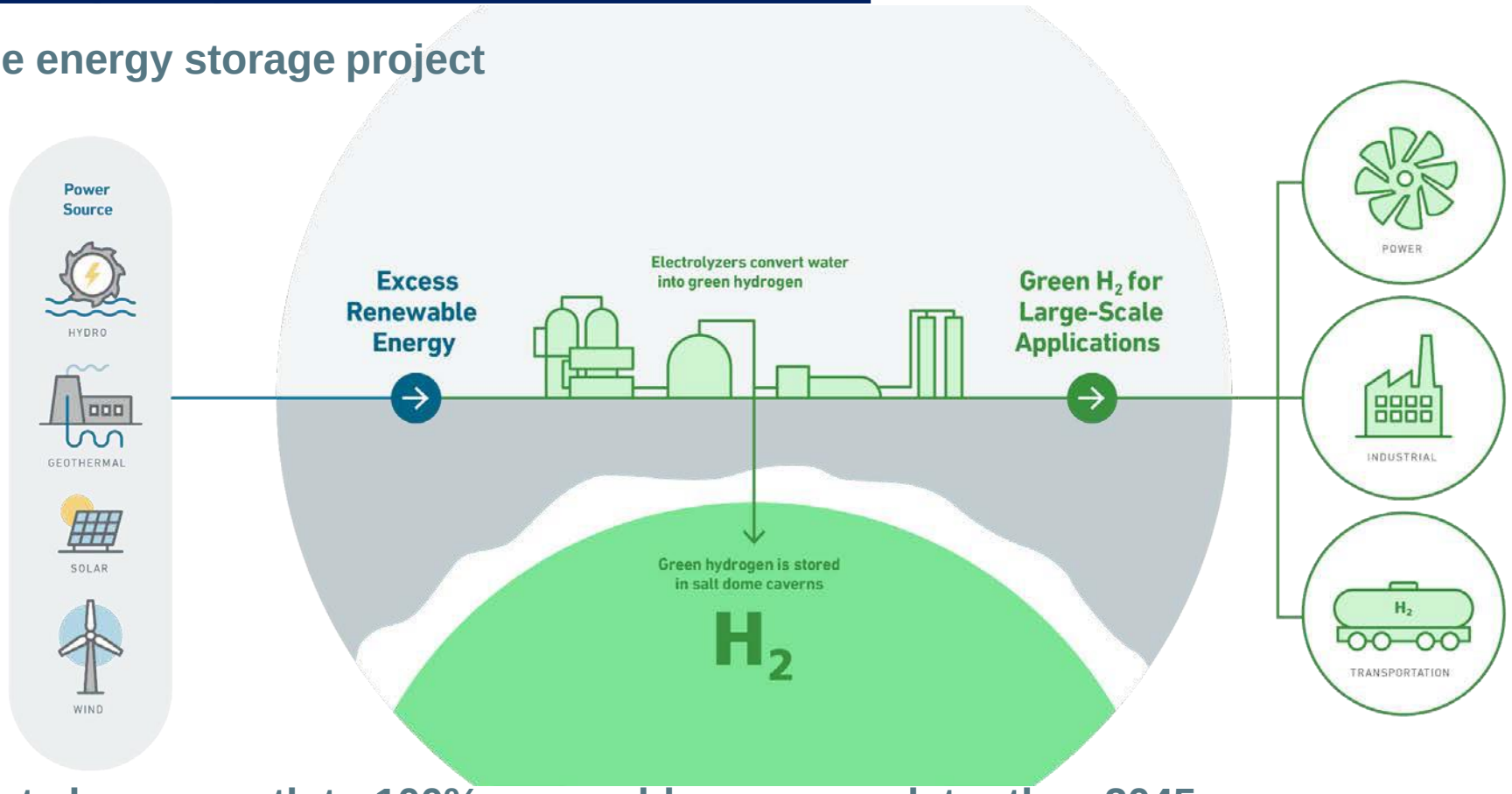
US: Advanced Clean Energy Storage Project & Intermountain Power Plant

The world's largest renewable energy storage project

Storage Capacity	150 GWh
Location	Utah, USA

Technology for Renewable-Hydrogen Energy Hub

Gas Turbine Model	M501JAC
Power Output	840 MW (by 2 CCGT)



This utility-scale project shows a path to 100% renewable power no later than 2045.