

KHI's Activity for International Liquefied Hydrogen Supply Chain

Kawasaki Heavy Industries, Ltd.



KHI Group Hydrogen Products



Hydrogen Gas Engine



Hydrogen Gas turbine



Hydrogen Boiler



Fertilizer Plant



Water Electrolysis System



Liquefier Plant



Liquefied Hydrogen Tanks

Production

Storage

Realization of Products
with
Corporate Technology Synergy



Liquefied Hydrogen Loading Arm



© : HySTRA

Liquefied Hydrogen Carrier

Utilization

Transport



Fuel Cell Train



High pressure Hydrogen Gas Valve

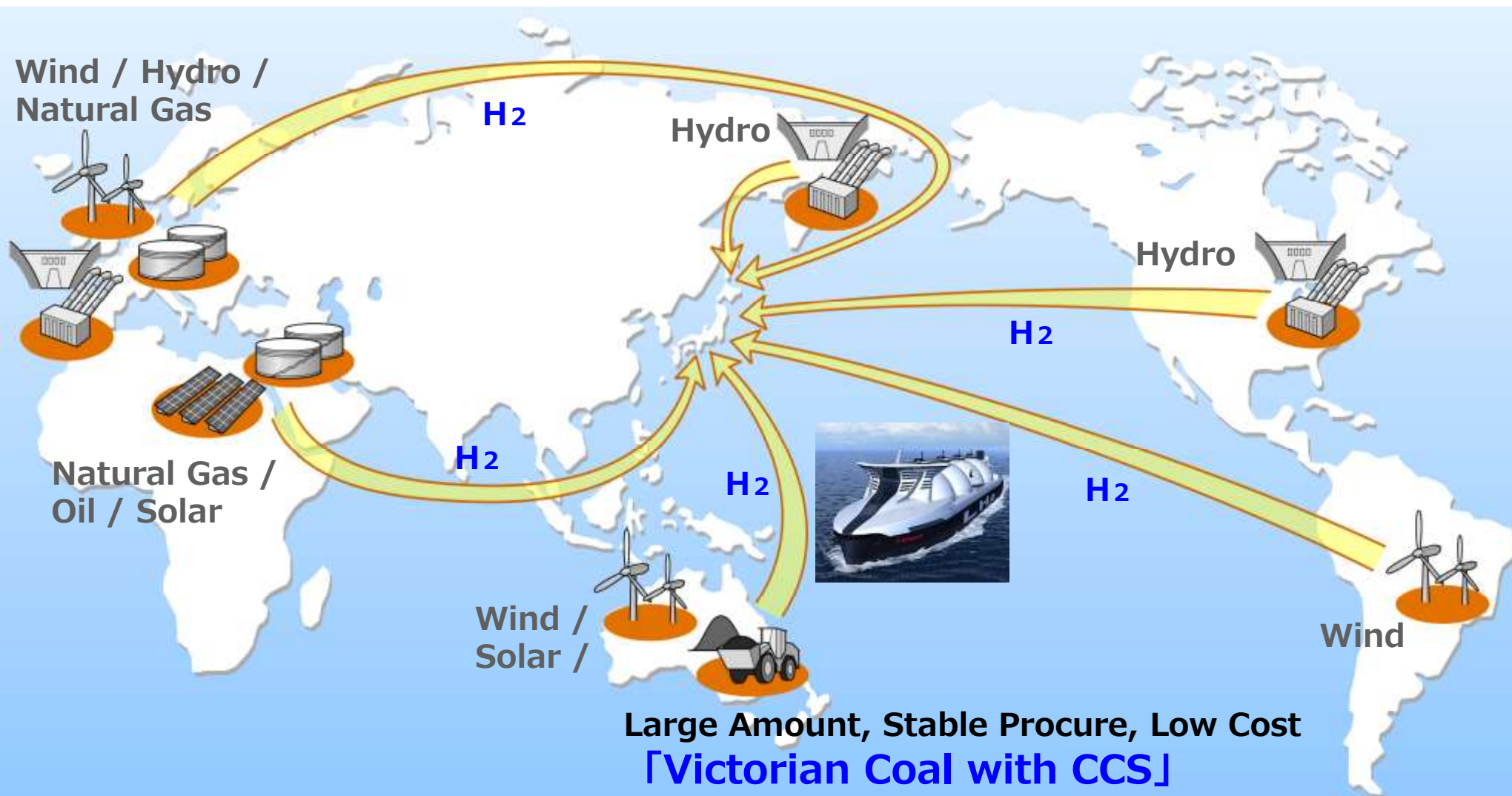


Compressed H₂ Trailer Trucks



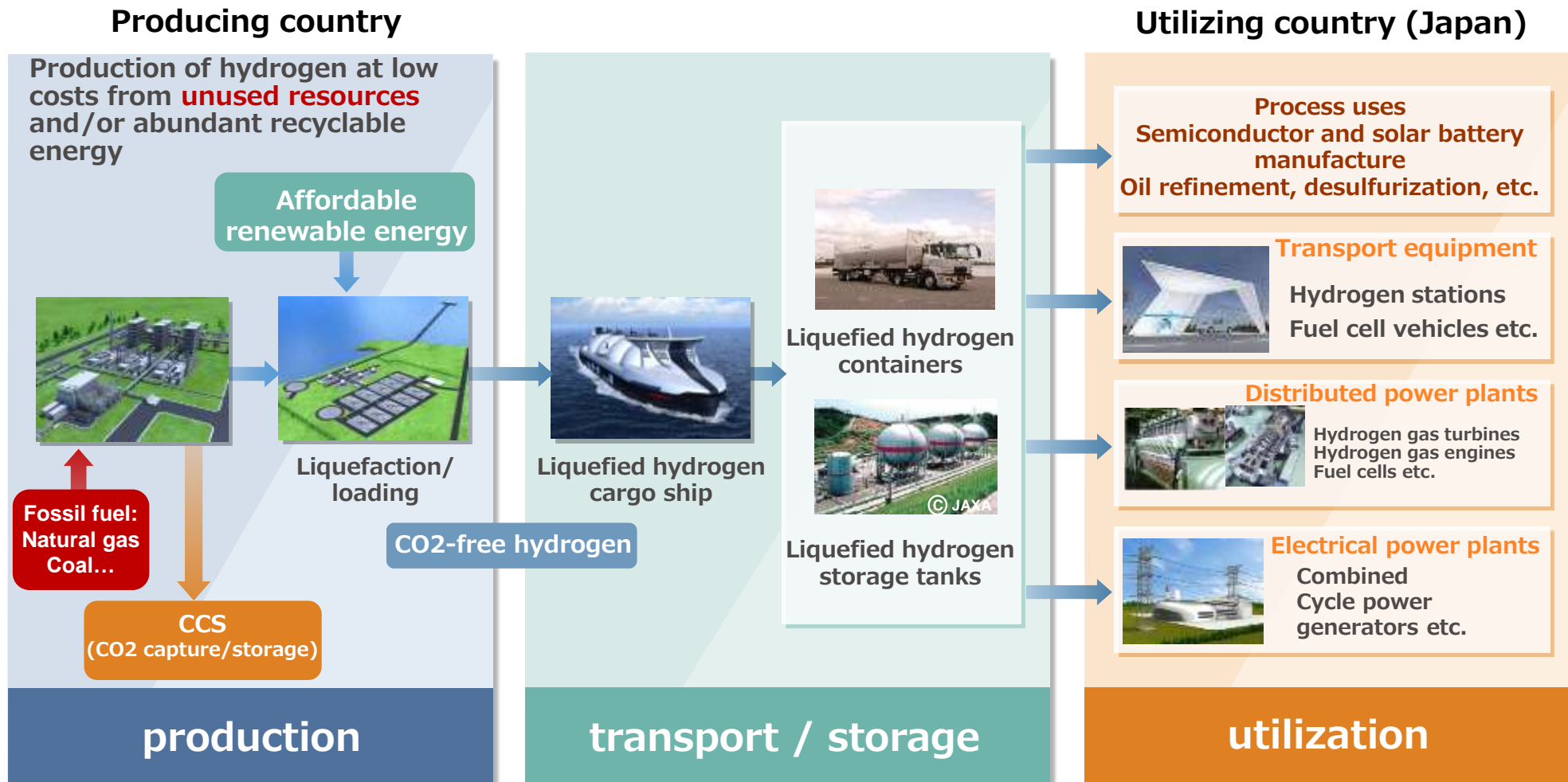
Liquefied Hydrogen Container

Expected CO₂-free H₂ Supply chain



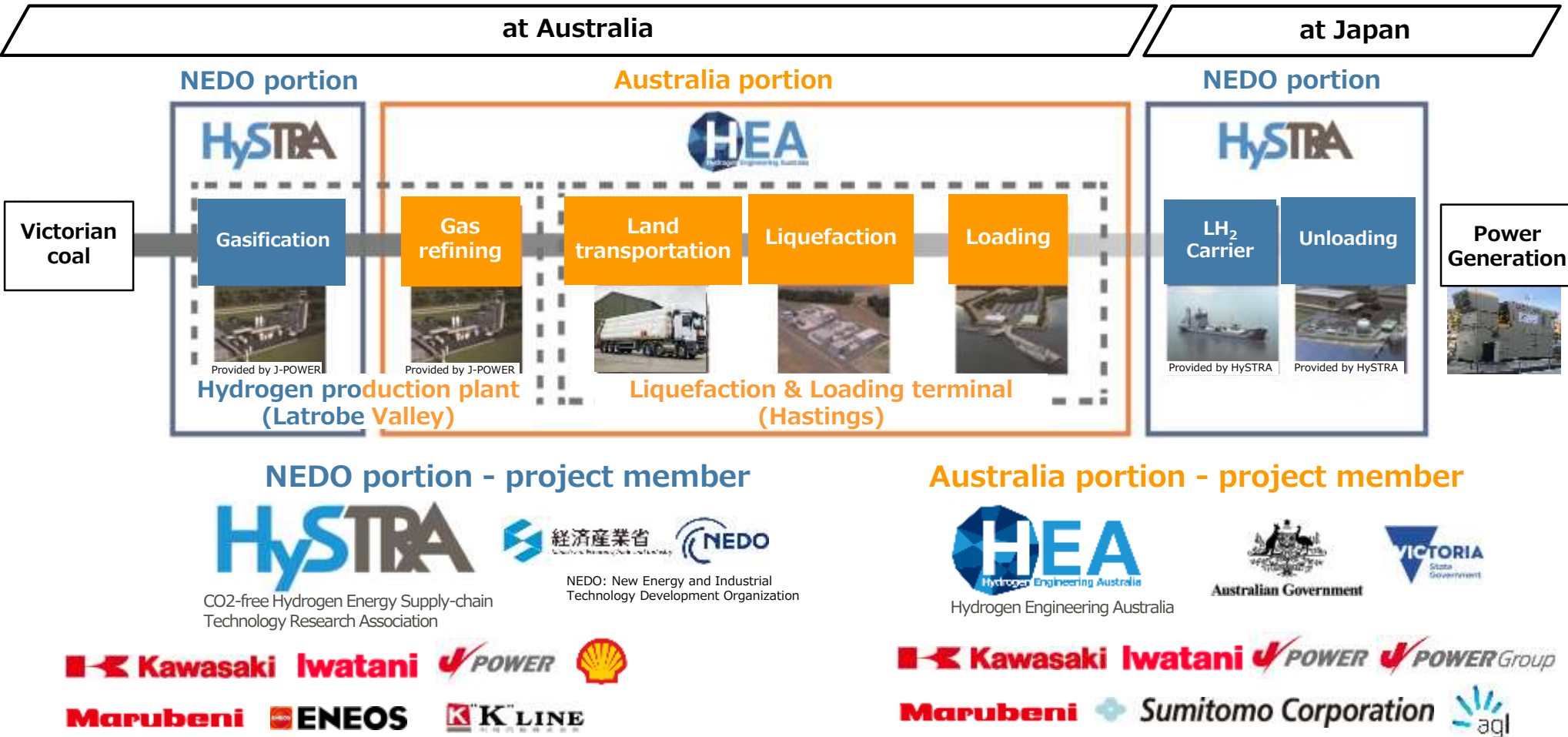
Concept of CO₂-free Hydrogen Chains

Stable energy supply while suppressing CO₂ emissions



Hydrogen Energy Supply Chain (HESC) Pilot Project Overview

Kawasaki is working with a number of partners on a pilot project supported by the governments of Japan and Australia.



Liquefied Hydrogen Carrier "Suiso Frontier"

Launch ceremony (11 December 2019)
at KHI Kobe Shipyard



Cargo Tank Installation (7 March 2020)
at KHI Harima Works



LH2 Receiving Terminal



Vent
Stack

LH2 Tank
2,500 m³

Loading System

Hydrogen Gas Turbine CGS at Kobe Port Island

CGS: Co-generation System

Combined heat and power supply management system using hydrogen and natural gas as a fuel. (Power Generation: 1 MW class)

Partners: Obayashi, Kawasaki, Kobe City, KEPCO, Iwatani, Kenes, Osaka University



Supported by NEDO*

*NEDO : New Energy and Industrial Technology Development Organization

Schedule toward Commercialization



Year	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031
① Pilot demo.	→												
② Large scale technology development	→												
③ Commercialization demo.		FS / FEED / EPC Basic design						Commercialization demo. and confirmation					
④ Commercialization (1st stage)								FS / FEED / EPC Basic design				Detail design and construction	
												Operation	

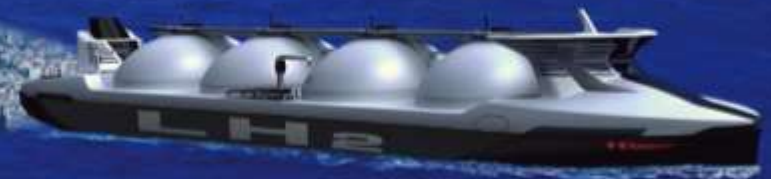
FS : Feasibility Study
 FEED: Front End Engineering and Design
 EPC : Engineering, Procurement, Construction

Policy makers

Investors

Industry

Step up together to unlock hydrogen potential for the decarbonized society!



Thank you for listening

Kawasaki, working as one for the good of the planet

世界の人々の豊かな生活と地球環境の未来に貢献する
“Global Kawasaki”

Kawasaki Heavy Industries, Ltd.
Corporate Technology Division
<https://global.kawasaki.com>