

Hydrogen and Fuel Ammonia Strategies in Japan

The Emerging Hydrogen Economy in the Asia Pacific Region

July 21, 2021

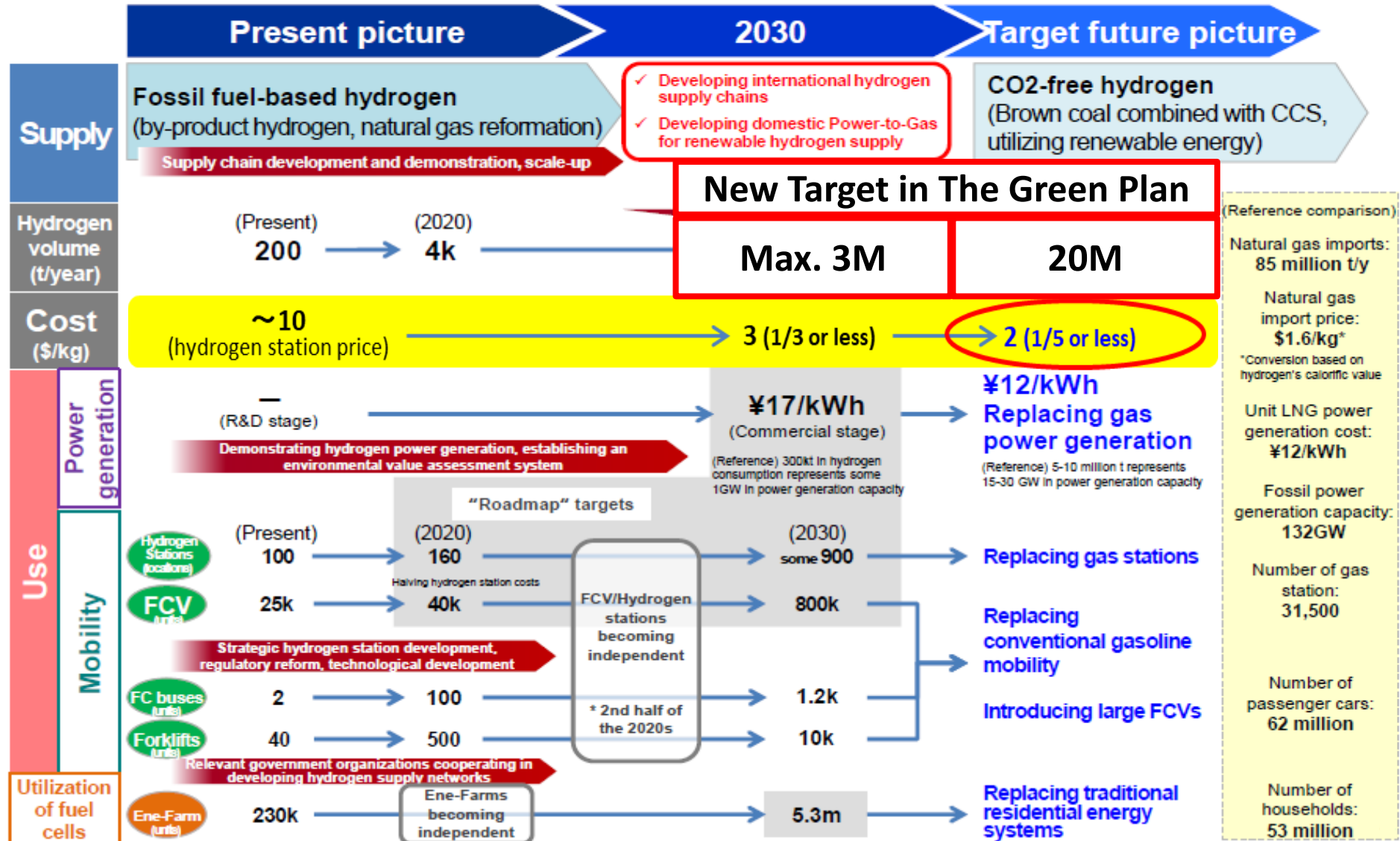
Shigeru MURAKI

Vice Chair, WEC Asia Pacific and South Asia

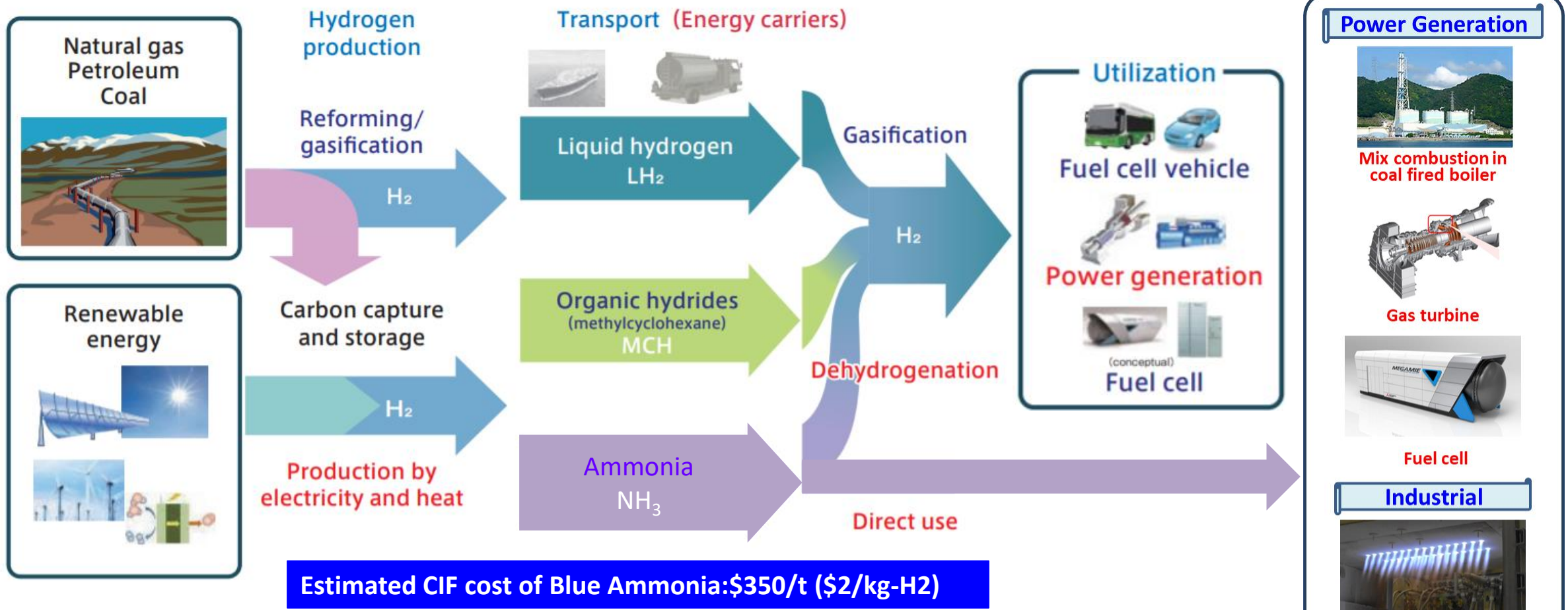
Representative Director, Clean Fuel Ammonia Association



Scenario for Basic Hydrogen Strategy in Japan



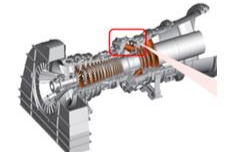
Hydrogen Energy Carrier



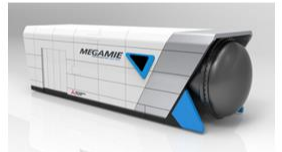
Power Generation



Mix combustion in coal fired boiler



Gas turbine



Fuel cell

Industrial



Furnace

Maritime

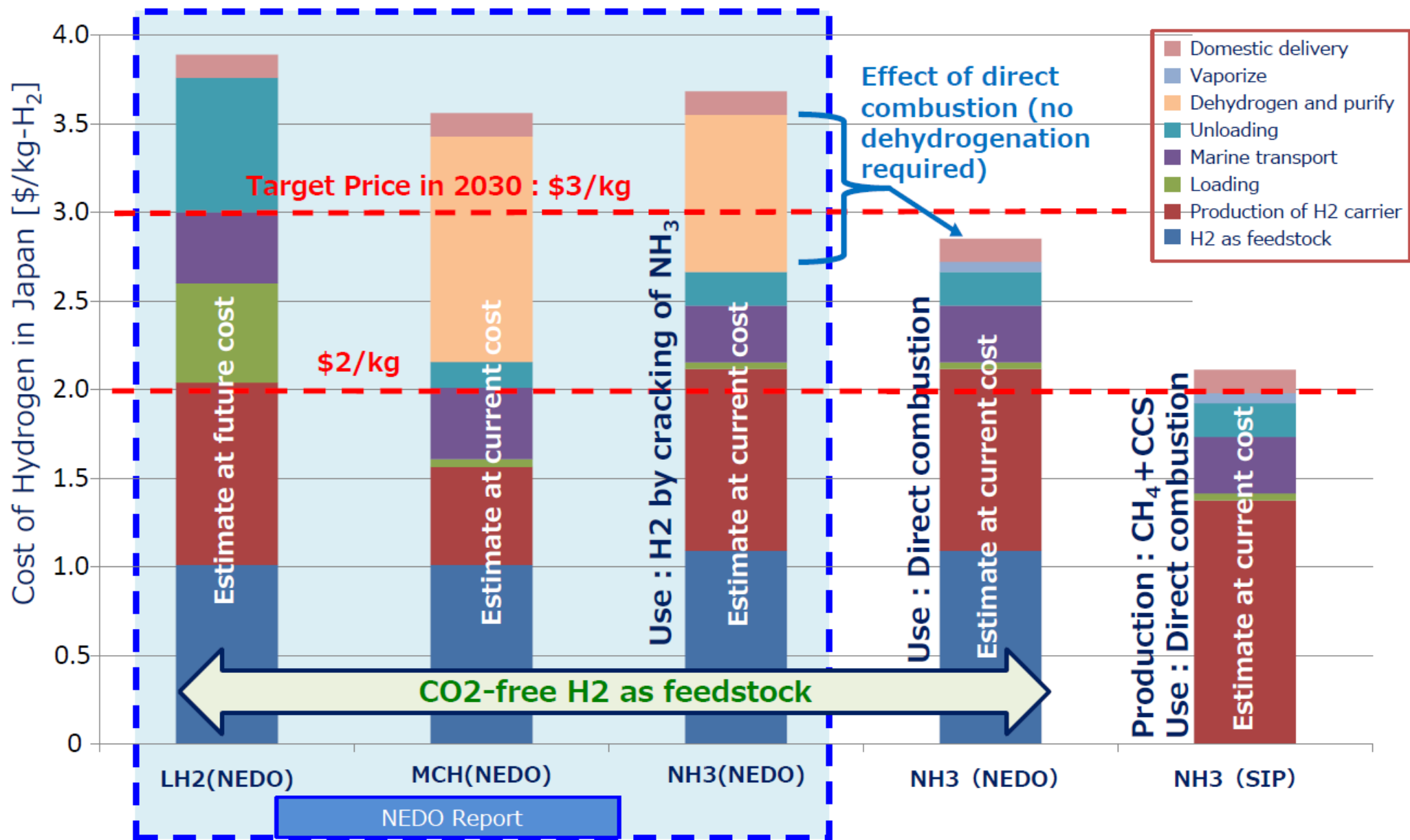


Deep-sea shipping

Transportation across the Ocean by H_2 Energy Carriers (Ammonia, LH_2 , and Organic Hydride) from Australia to Japan, **Ammonia is likely the cheapest mechanism**
 (“The Future of Hydrogen”; prepared by the IEA for the G20, Japan in 2019)



Cost Comparison of Hydrogen Carriers



Ongoing Projects of International H2 Supply Chain

Japan-Brunai Pilot Project

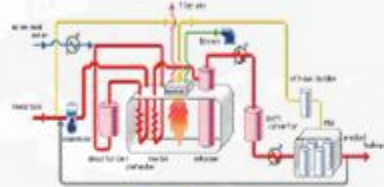
2020~



Off-gas



Steam Methane Reforming



Hydrogenation*
(TOL→MCH)



Chemical Tanker



Dehydrogenation*
(MCH→TOL)



Japan-Australia Pilot Project

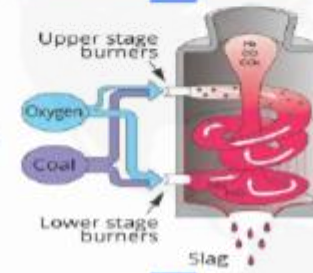
2020~



Brown Coal + CCS



Gasification



Liquefied H₂ Carrier*



Loading Facility*



Roadmap of Fuel Ammonia Value Chain

