

Implementation Plan of C-free Ammonia Value Chain

The 2nd Ammonia=Hydrogen 2.0 Conference

August 27th, 2020

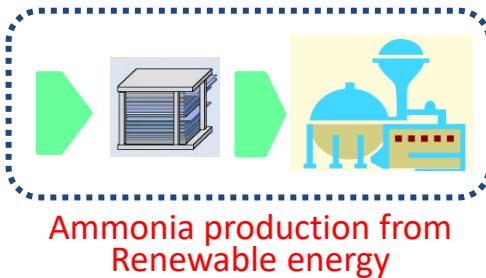
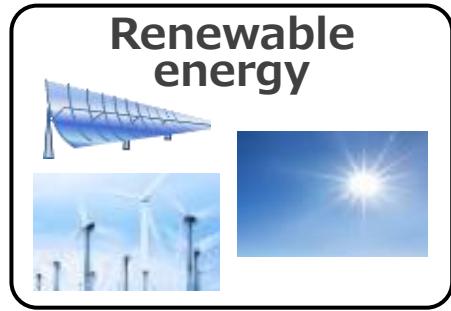
Shigeru MURAKI
Representative Director

The Green Ammonia Consortium



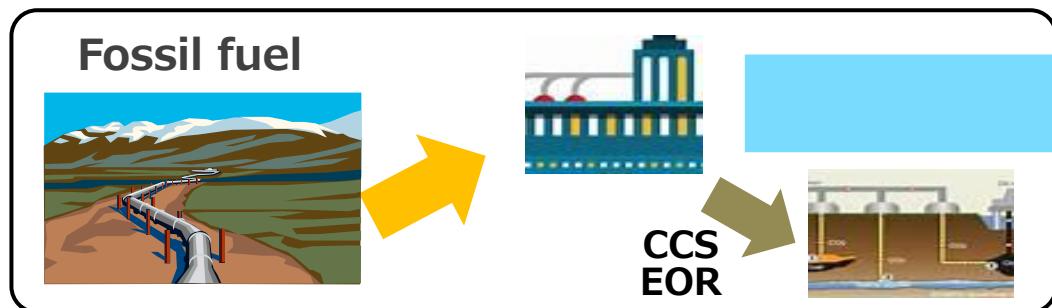
THE GREEN AMMONIA CONSORTIUM

Strategy for Fuel Ammonia



Fuel Ammonia

Feasibility study of
C-free Ammonia Supply Chain



Fuel Ammonia

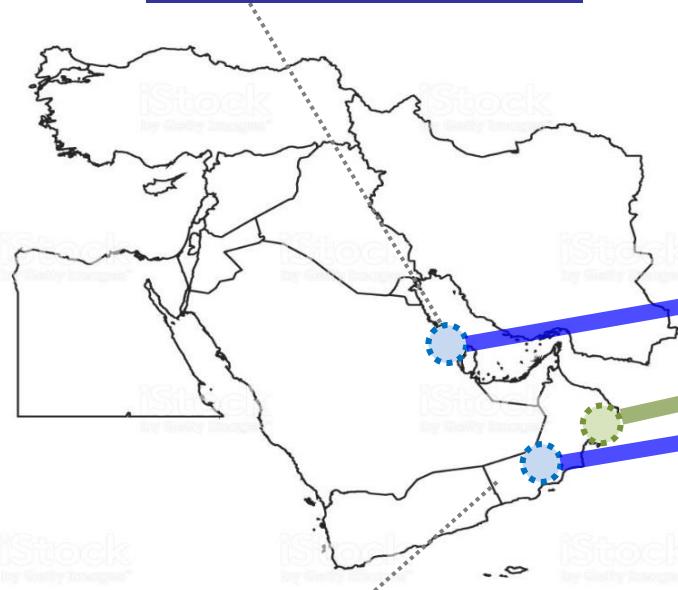
Estimated Price
\$340/ton (\$2/kg-H₂)



Taking into account all cost components, transmission and distribution of hydrogen as ammonia is likely the cheapest mechanism for imports to Japan from Australia
(IEA Hydrogen Report for G20 in 2019)

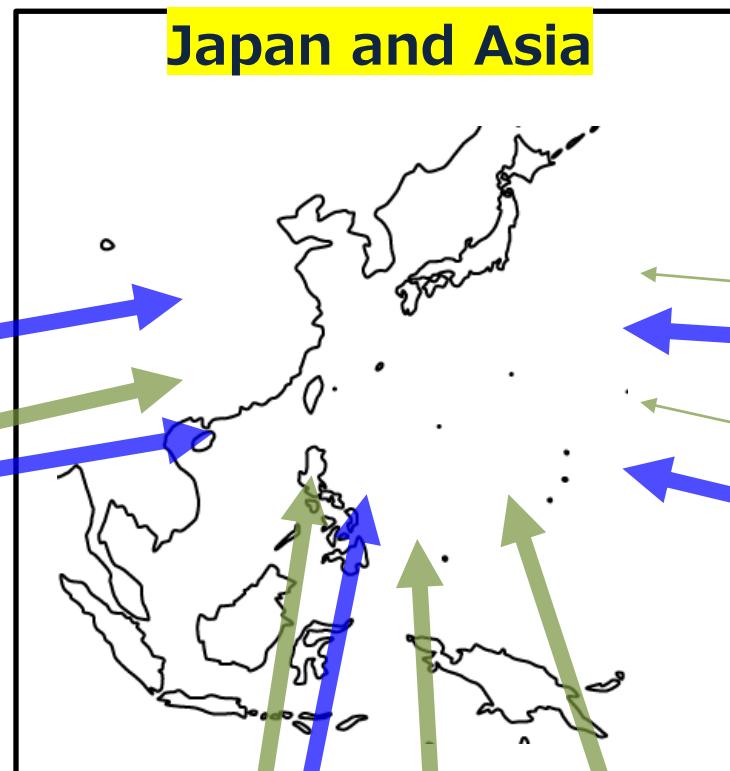
Potential Supplies of Blue and Green Ammonia

Saudi Arabia



Oman

Japan and Asia



Australia
Western, South, Queensland



Canada



USA

→ Natural Gas (Blue)
→ Renewables (Green)



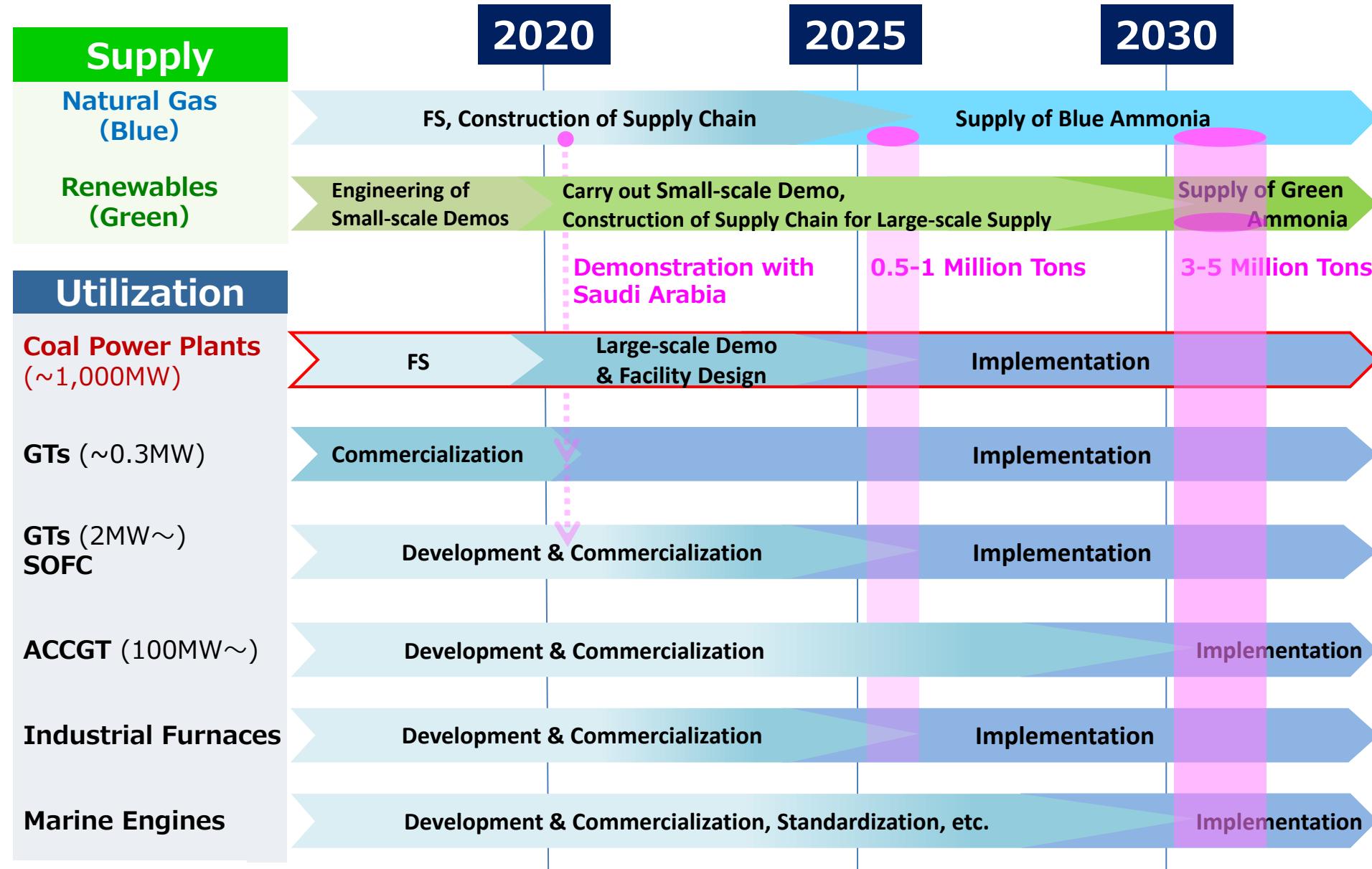
THE GREEN AMMONIA CONSORTIUM

Implementation Plan of C-free Ammonia Value Chain

Phase	Utilization	Supply
I	<ul style="list-style-type: none">▪ Mixed Combustion in Coal Power▪ Development of NH₃ Supply Infrastructure (Primary Receiving Terminal + Delivery system)	<ul style="list-style-type: none">▪ Market Entry by Cost Effective Blue Ammonia
II	<ul style="list-style-type: none">▪ Distributed Power (Small & Medium GTs, SOFC)▪ Mix Combustion in ACCGT*▪ Industrial Furnaces▪ Marine Engines <p>*ACCGT: Advanced Combined Cycle Gas Turbine</p>	<ul style="list-style-type: none">▪ Expansion of Market by Blue Ammonia▪ Introduction of Green Ammonia▪ Scale up of Green Ammonia Supplies▪ Cost Reduction of Green Hydrogen Production
III	<p>“C-free Power Generation”</p> <ul style="list-style-type: none">▪ Single Fuel Ammonia ACCGT▪ Replacement of Coal Power to ACCGT	<ul style="list-style-type: none">▪ Large Scale Green Ammonia Supplies & Continuous Supplies of Blue Ammonia for Global Fuel Ammonia Market



Roadmap of Ammonia Supply Chain



Key Actions

- Bilateral partnership between Australia and Japan to develop Ammonia Value Chain -
 - Bilateral technical and engineering collaborations.
 - Support for pilot, trial and demonstration projects.
 - Responsive policy and regulatory frameworks to develop consistent approaches for efficient value chain and investment environment.
 - Partnership between governments to develop common standards, regulations and certifications.
 - Partnership between industries to develop markets, trade scheme and long-term investment.

