

Japanese initiatives to establish Fuel Ammonia Supply Chain

5th annual Ammonia Energy APAC conference
(August 16-18, 2023 at Newcastle, Australia)

Day 2 / 11:00-12:30 Harmonizing certification across the APAC region

Marubeni Corporation

August 17, 2023

1. Introduction of CFAA and Marubeni

Clean Fuel Ammonia Association (CFAA)

Establishment

Apr 1, 2019
Jan 14, 2021

Green Ammonia Consortium
Clean Fuel Ammonia Association

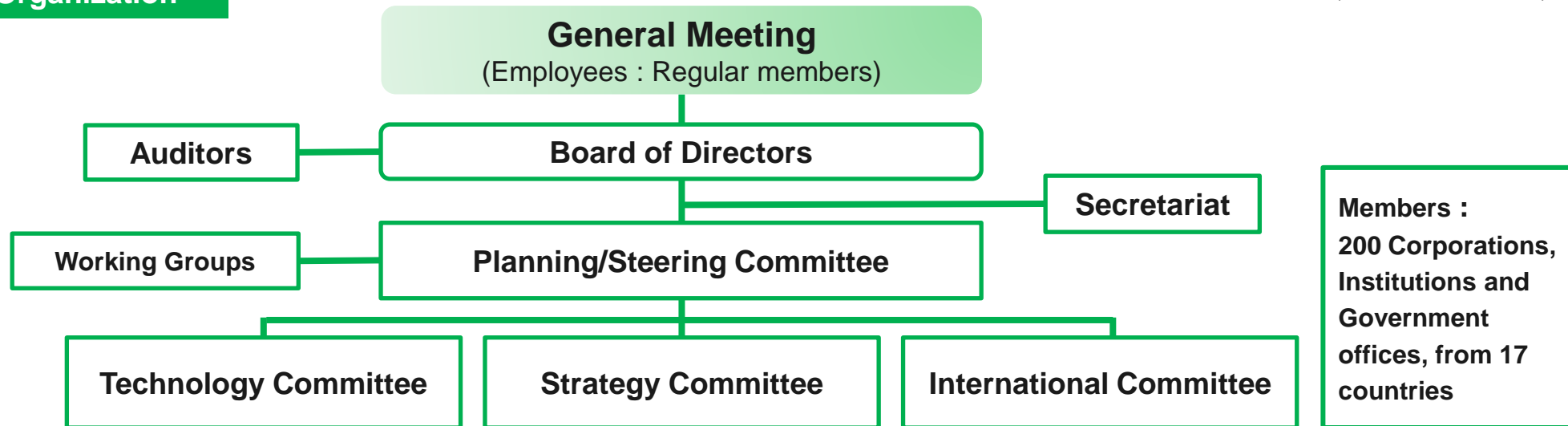
Key Objectives

- Implementation of clean fuel ammonia value chain
- Promotion of policy and regulations
- Coordination of RD&D activities
- International relationship and collaboration

Organization



(President: Dr. Muraki)





○ Marubeni - Company Profile

● Founded	May 1858
● Incorporated	December 1, 1949
● President and CEO	Masumi Kakinoki
● Paid-in Capital	262,947 million yen
● Head Office	4-2, Ohtemachi 1-chome, Chiyoda-ku, Tokyo, 100-8088, Japan
● Number of Branches and Offices	132 branches and offices, consisting of Head Office, 12 Japan branches and offices, 56 overseas branches and offices, and 29 overseas corporate subsidiaries containing 34 branches and offices.
● Number of Employees (non-consolidated)	4,379
● Number of Employees (consolidated)	46,100



(As of March 31, 2022, except * as of April 1, 2022)

○ Marubeni Group by Numbers

Marubeni Group Number of Bases 132 branches/offices <small>* Including Japan, as of April 1, 2022</small>	Number of Consolidated Companies 463 	Number of Group Employees 46,100 	Company Employees Positioned Overseas 822  <small>* As of April 1, 2022</small>
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Volume of Raw Coffee Beans Traded
30 % of Raw Coffee Consumed in Japan
 Marubeni handles approximately 30% of raw coffee beans consumed in Japan.
* As of October 2022

Number of LNG Vessels Owned
16 LNG vessels
 Marubeni owns 16 LNG carriers currently in operation out of the 609 LNG carriers that exist worldwide (as of September 2022, excluding small vessels and FSRUs).
* As of September 2022

Copper Equity Volume
150,000 tons
 Conducting copper mining business in Chile. Equity volume is one of the largest in Japan.

Number of Aircrafts Owned & Managed
250 aircrafts
 Marubeni commenced investment in Aircraftle Limited in 2013, and we are now leasing aircraft to 74 airlines in 44 countries worldwide through this company.
* As of May 2022

Helena Agri-Enterprises, LLC
Nationwide Network in the United States.
Approx. 500 locations
 Helena is the No. 2 agri-input retailer in the United States, which is one of the largest crop producing countries in the world.
* As of September 2022

Cumulative total number of pairs of IFME children's shoes sold
Approx. 30 million pairs
 IFME, a children's shoe brand produced by Marubeni Footwear, boasts the top market share in Japan.
* As of September 2022

Power generation capacity (net)
12,022 MW
 As a leading Independent Power Producer (IPP), Marubeni has world class net power generation capacity and overseas

Provision of Housing in China
Approx. 14,500 units
 Marubeni was one of the first Japanese companies to enter into the Chinese real estate market and has been engaged in such business operations as the development of housing for Chinese homebuyers and complex facilities since 1985.

Population Served by Marubeni's Water Business
Approx. 16.5 million people
 Marubeni operates various water projects, including water supply and wastewater businesses, mainly in Latin America, Asia, the Middle East, and Europe.
* Population served by Marubeni's four concessions in Europe, South America, and Asia, as well as water purification projects in South America and desalination projects in the Middle East. * As of June, 2022

Global Olefin Trading Market
Approx. 30 % share
 Using specialized tankers, Marubeni has secured approximately 30% of the global olefin trading market.
* As of September 2022

Afforestation Business Sites
Approx. 130,000 hectares
 2 projects in 2 countries managing plots of afforestation-possible land roughly equivalent to 60% of the area of Tokyo.
* Leading site area among Japanese companies * As of October 2022

Number of customers in the U.S. financing used car loans
Approx. 1.14 million
 Through Nowlake Technology, one of the top independent used car loan companies in the U.S., we provide loans for used cars throughout the country.
* As of August 2022

Marubeni Group in Oceania - Overview-

Western Australia

- Marubeni Iron Ore Australia
- WA Plantation Resources
- Dampier Salt
- Energy Infrastructure Investments –
 - Telfer - Nifty Gas Pipelines
- Marubeni Australia – Perth Office

Northern Territory

- Energy Infrastructure Investments –
 - Bonaparte Gas Pipeline
 - Wickham Point Gas Pipeline

South Australia

- Energy Infrastructure Investments –
 - Murraylink Interconnector
- Royal Adelaide Hospital

Victoria

- Marubeni Australia – Melbourne Office
- Marubeni Aluminium Australia (head office)
 - Portland Aluminium Smelter
- Energy Infrastructure Investments –
 - Murraylink Interconnector



Affiliated Entities: 22 entities
Expatriates: 36 people
(as of 1 April 2023)

New South Wales

- Marubeni Australia – Sydney Office
- SmartestEnergy Australia
- Energy Infrastructure Investments –
 - Directlink Interconnector
- Hitachi Construction Machinery Australia
- Marubeni Equipment Finance
- Rangers Valley Cattle Station
- Sydney Metro Northwest

Queensland

- Marubeni Resources Development (head office)
 - Investment in Coal Mines
- Marubeni Aluminium Australia
 - Boyne Smelter
 - Gladstone Power Station
- Energy Infrastructure Investments –
 - Kogan North Gas Facility
 - Directlink Inter connector
 - Allgas Distribution Network -GDI
- ACL Group
- Gold Coast Light Rail (GoldlinQ)
- LCA Holdings

New Zealand

- Marubeni New Zealand
- Marusumi Whangarei



Papua New Guinea

- Marubeni Australia – Port Moresby Office
- Merlin Petroleum Company

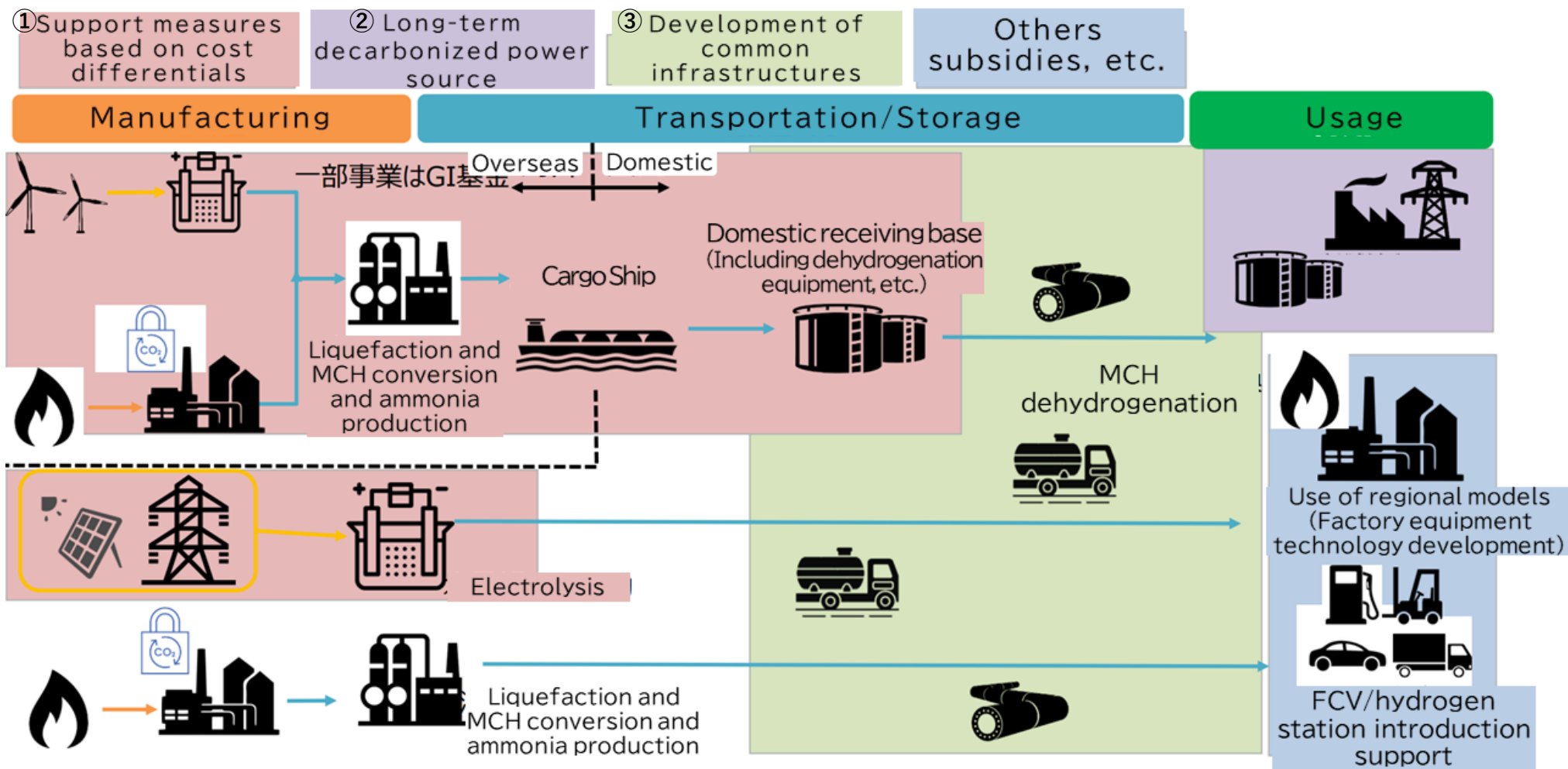


2. Govt Support for Ammonia Supply Chain

Ammonia Supply Chain - Support Mechanism

Japanese Govt sets 3 mechanisms to enhance realization of fuel ammonia/hydrogen supply chain, i.e.

- ① Support measures based on cost differentials,
- ② Auction for long-term decarbonizing electricity, and
- ③ Development of common infrastructures.



3. Draft definition of Clean Ammonia by CFAA

Draft Definition of Clean Ammonia

(to Achieve Increased Use and Steady Decarbonization)

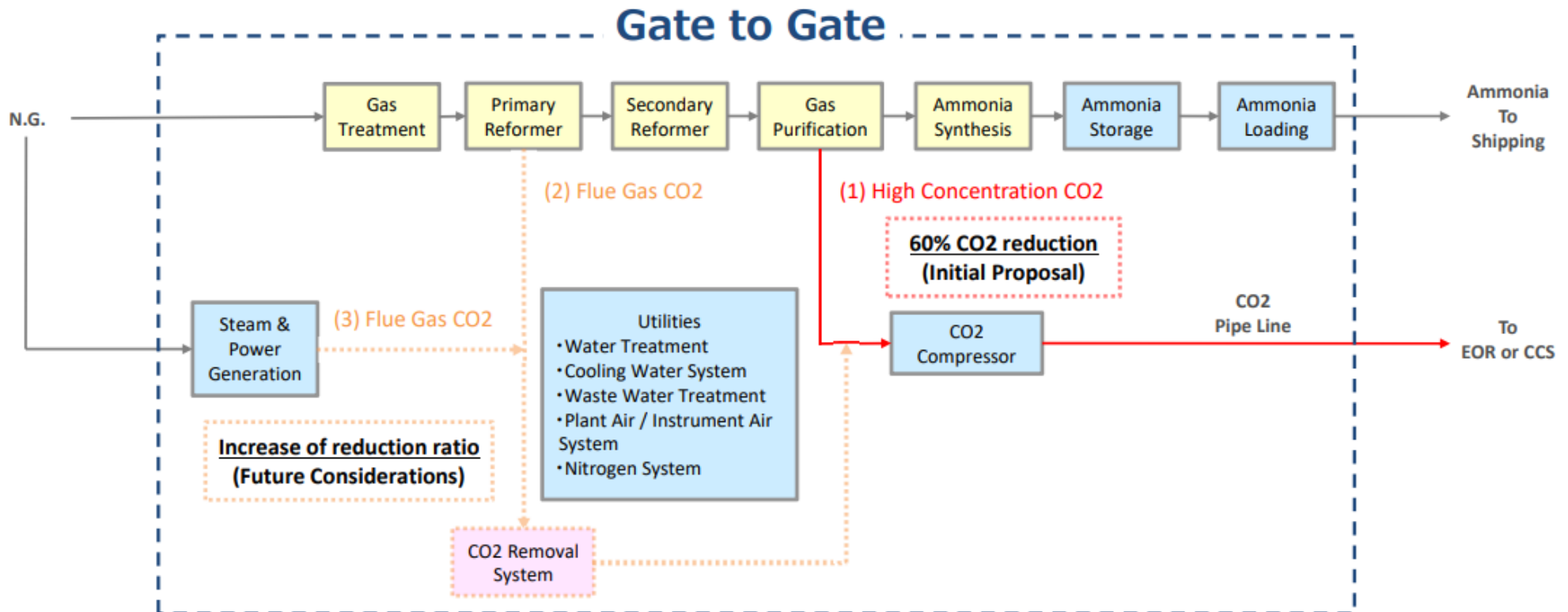
Item	Initial Proposal	To discuss in future
Threshold (Tentative)	<p><u>0.84t-CO2e/t-NH3 or Lower</u></p> <p>(At least 60%* CO₂ reduction, at conventional SMR process)</p> <p>* utilization of existing plant considered</p>	<p>Increase of <u>reduction ratio</u>, reflecting latest technologies</p>
Calculation Boundary	<p>"Gate to Gate", due to lack of CI of feedstock natural gas</p>	<p>"Well to Gate", subject to availability of CI of feedstock natural gas</p>
CO2 Reduction Method	<p><u>CCS and EOR*</u></p> <p>* EOR is eligible, if "equivalent to CCS"</p>	<p>Additional methods, such as <u>offset</u> and <u>CCU</u></p>



Definition of “Gate to Gate” at SMR process

CO2 to be recovered from

- (1) Gas Purification (CO2 Absorber) **as Initial Proposal**, and
- (2) Primary Reformer (3) Boiler for Power Generation for **Future Considerations**



4. International Certification Scheme

○ Initiatives of leaders for clean ammonia supply chain

In April 2023, global leaders met to discuss various issues including ammonia at G7 held in Japan.

“G7 Climate, Energy and Environment Ministers’ Communiqué” Sapporo, April 16, 2023]

Low-carbon and renewable hydrogen and its derivatives such as ammonia: We recognize low-carbon and renewable hydrogen and its derivatives such as ammonia should be developed and used where they are impactful as effective emission reduction tools to advance decarbonization across sectors and industries, notably in hard-to-abate sectors in industry and transportation.

We also note that some countries are exploring the use of low-carbon and renewable hydrogen and its derivatives in the power sector to work towards zero-emission thermal power generation if this can be aligned with a 1.5°C pathway and our collective goal for a fully or predominantly decarbonized power sector by 2035,

We affirm the importance of developing international standards and certification including for a GHG calculation methodology for hydrogen production and mutual recognition mechanism for carbon intensity-based tradability, transparency, trustworthiness and sustainability.

(item no 67)



○ Necessity of Definition/Certification

Parties involved in supply chain need clear definition and certification scheme;

- Ammonia producers: for FID on the ammonia production project.
- Ammonia consumers: for FID on plant modification & receiving facility construction (e.g. electricity company)
- Financiers: for financing toward “clean” energy supply chain.

Issues

- As clean ammonia supply chain is targeted to be realized by 2030, all elements of the supply chain need to move into development phase within a few years. =5 years gap=
- Producer/Financier needs predictability for the investment decision on production facility including CO2 abatement requirements, which need to be ensured that rules will not change later.



Our thoughts

- Discussion on the definition/certification for “clean” ammonia are progressing in many countries. There is a concern that the producers will be inclined to build facility matching with condition of importing country that sets the ‘**strictest**’ standard, if there is no harmonization among concerned countries/companies. As it may result in unexpected cost increase and schedule delay, progressing harmonization effort within APAC and other ammonia producing countries is desirable.
- Japanese METI has stated the threshold “0.84t-CO2e/t-NH3” in the Hydrogen Basic Strategy announced on June 6, 2023, and it seems a reasonable guideline for at least initial projects.

We look forward to working with you for clean ammonia supply chain!

If you have any question, please contact me in following address.

Thank you very much!

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