Japan’s vision and actions toward hydrogen-based economy

Hydrogen and Fuel Cell Strategy Office

METI

Japan's policy toward "Hydrogen-based Society"

Basic Hydrogen Strategy (Dec 2017)

- First comprehensive national strategy
- H_2 as a future energy option toward 2050
- Detailed strategy with numerical targets
  ($3/kg by 2030 ⇒ $2/kg by 2050)

Japan declared its carbon neutrality by 2050 (Oct 2020)

Green Growth Strategy (Jun 2021)

the Sixth Strategic Energy Plan (Oct 2021)

Hydrogen Prospective Market (Japan)

Supply

Existing By-product → (CCUS) → Clean Hydrogen

(Oil refinery, Steel Plant)

Import Hydogen (Int`l Supply Chains) →

Water Electrolyzer (Domestic Production) →

Demand

FCV, FC bus, **FC truck** → 6 mil. ton

Large Power Plant → 5-10 mil. ton

Steel Plant 7 mil. ton →

Source) METI

Japan Hydrogen Snapshot I

H_2 Mobility

H_2 Station Network

*169 Stations

H2 station for FC bus opened

H_2 Applications

FC bus deployment
106 FC buses

FC Truck development

R&D

6427 FCV

FC train demonstration

FC train

ISUZU HONDA The Power of Dreams
HINO TOYOTA

2020～

FC Truck

Joint Venture for H_2 Infrastructure Development

2018～

Local/regional projects

Fukushima prefecture

a 10M electrolyser with 20M solar PV started

Creating Hydrogen Hubs

"Hydrogen Utilization Study Group in Chubu"

2020

Sumitomo Corporation TOYOTA SMBC and 7 companies

"Hydrogen Utilization Council in Kobe/Kansai area"

Iwatani Marubeni and 9 companies

Japan Hydrogen Snapshot II

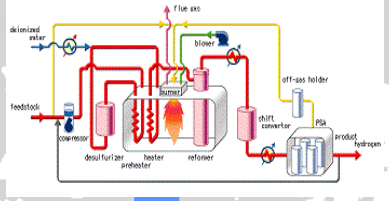
International hydrogen supply chain

Japan-Brunai Pilot Project

AHEAD

Off-gas

Steam Methane Reforming



Hydro-genation*
(TOL→MCH)

Chemical Tanker

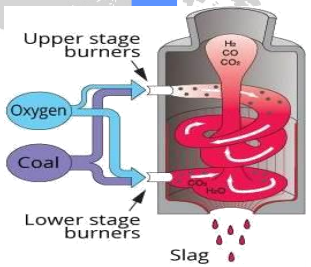
Dehydro-genation*
(MCH→TOL)

Japan-Australia Pilot Project

HySTRA

Brown Coal +CCS

Gasification



Liquefied H_2 Carrier*

Loading Facility*

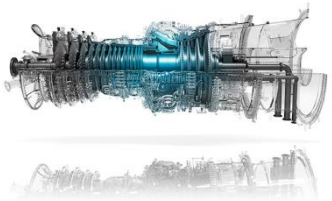
Hydrogen power generation

In Utah State in US, a power generation project started, with a 30% H2 blending by 2025 and 100% H2 by 2045.

LA DWP Los Angeles Department of Water & Power

MITSUBISHI POWER

Plans have also been launched in other states in the United States (NY, VA, OH) and Singapore.



Source: Mitsubishi Power

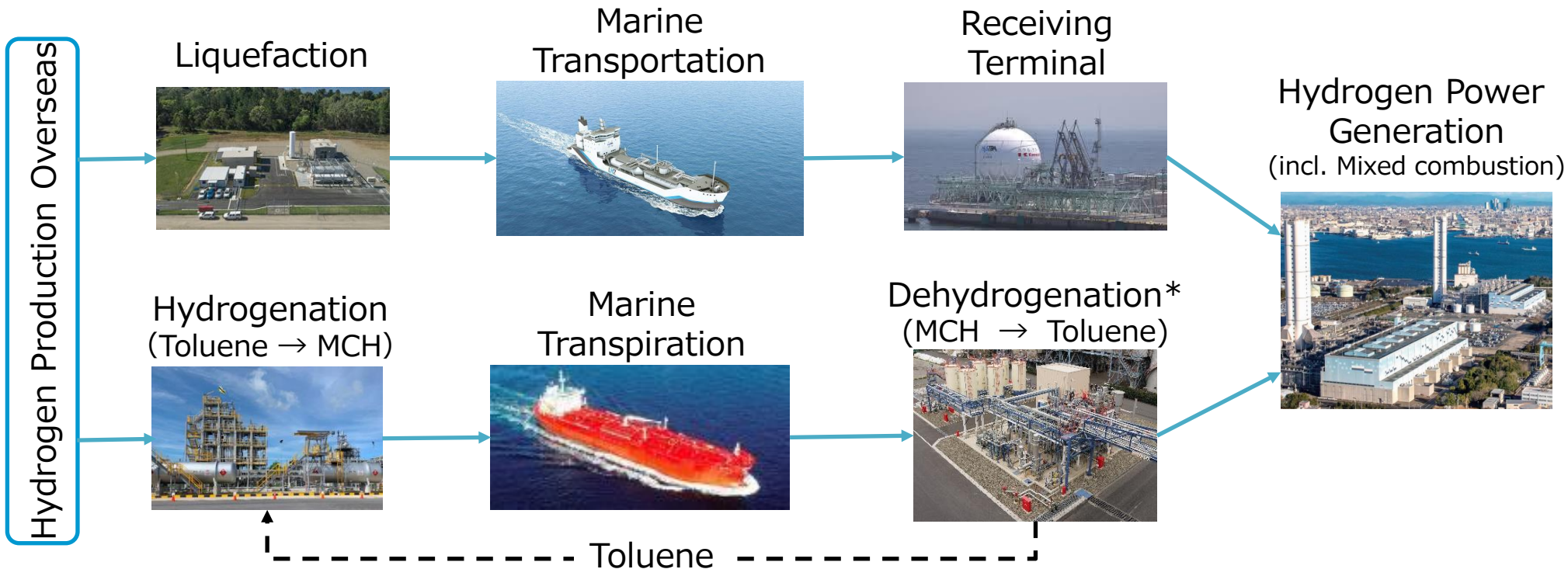
Stationary Fuel Cells at home

FC CHP* for home use: More than 400,000 units installed

GI Fund Project① : Establishing Global Hydrogen Supply Chain

- By using the Green Innovation Fund, Japanese government will support large demonstration projects at the aim of commercializing global supply chain with several carriers and hydrogen power generation no later than 2030 **(~300 Billion Yen)**.
- The goal of this project is to establish a strong technological base to attain the hydrogen supply cost target **(¥30/Nm3 by 2030, less than ¥20/Nm3 in 2050)**

Image of Global Supply Chain of Liquid Hydrogen(LH2) and Methylcyclohexane



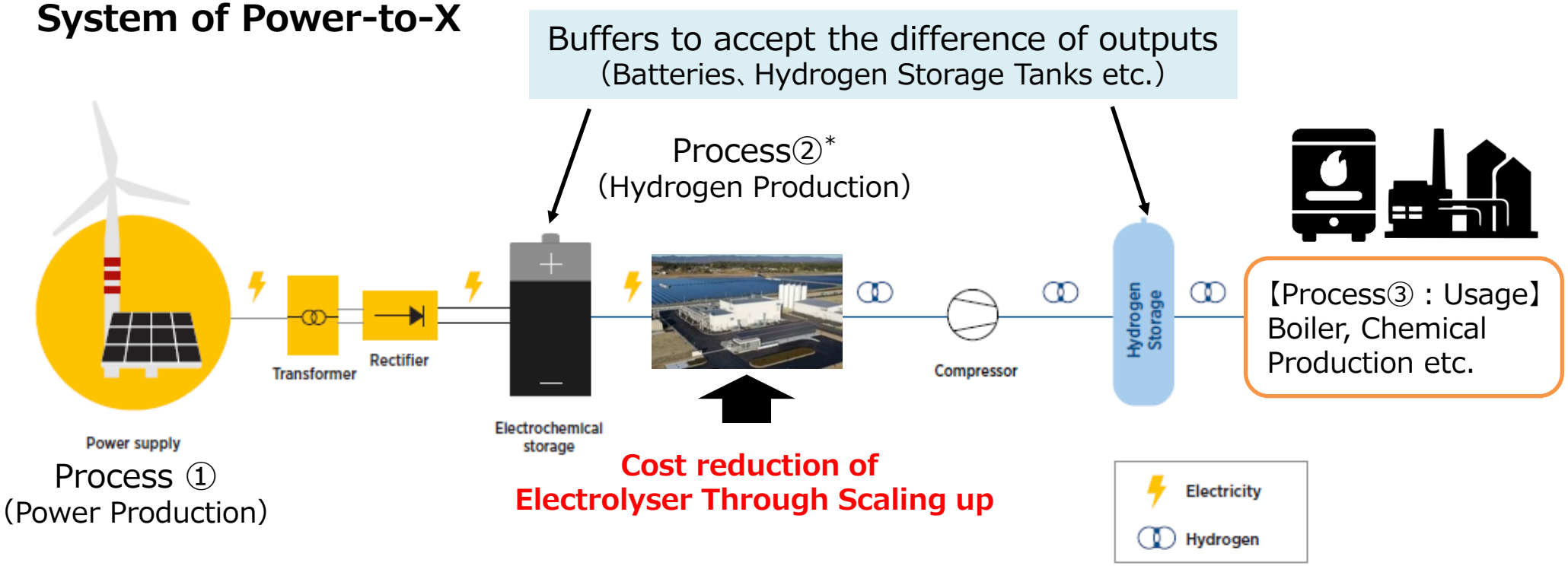
*Try to make the most of the existing assets such as oil refinery plants.

Source : HySTRA、AHEAD, etc.

GI Fund Project② : Scaling up Electrolysers

- To further reduce the cost of electrolysers, Japanese government will support demonstration projects for 1) scaling up electrolysers, 2) implementing superior components and 3) system optimization with several demands(**~70 Billion Yen**)
- The goal of this project is to establish a strong technological base to attain the cost of electrolyer **(up to 1/6 of the current system cost)**

System of Power-to-X



System optimization (i.e. balance the trade off between flexible operation and preparing buffers) is a crucial step to minimize the hydrogen supply cost

Hydrogen Energy Ministerial Meeting

2018

21 countries（**5** ministers）, region and organizations

300 attendees

TOKYO STATEMENT

- Harmonization of Regulation, Codes and Standards
- Joint Research and Development
- Study and Evaluation of Hydrogen's Potential
- Education & Outreach

2019

35 countries（**8** ministers）, region and organizations

600 attendees

GLOBAL ACTION AGENDA

2020

(On-line Special Event)

23 representatives（**14** ministers）from countries, region and organizations

2800 registrations/**+10,000** views

GLOBAL ACTION AGENDA PROGRESS REPORT

2021

(On-line Special Event)

29representatives（**18** ministers）from countries, region and organizations

3200 registrations