Progress Report on EGCFE

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Expert Group on Clean Fossil Energy (EGCFE)

9-10 Apr. 2025

EGCFE-related APEC Events（2024）①

Asia-Pacific Economic Cooperation

EGCFE（Expert Group on Clean Fossil Energy）

- Joint Meeting of EGCFE2024 & EGEEC 62　(Nanjing,China, May, 2024)
- APERC Clean Hydrogen Workshop associated with EGNRET 60 (Kaohsiung, Chinese Taipei, April, 2024)
- Workshop on Stocktaking Challenges and Opportunities for Energy Transition towards Decarbonization both in Energy Demand and Supply Sides (Nanjing, China, May, 2024)
- APERC Fossil Fuel Reports 2023: Oil(Feb.), Coal(Feb.), Gas(May), Hydrogen(May)

EGCFE-related APEC Events（2024）②

Asia-Pacific Economic Cooperation

◆ APEC Oil and Gas Security Initiative (OGSI)

①The 7th Oil and Gas Security Network (OGSN) Forum
(Osaka,Japan, Mar.2024)

②The 7th and Gas Security Exercise（OGSE)
(Bangkok,Thailand in Sep. 2024)

③Final Report of the Oil and Gas Security Study Series 20 (OGSS)
(Nov. 2024)

◆ new project proposed by Japan

APEC Workshop on Cleaner and More Efficient Operation of the Fossil Energy Industry　(Endorsed in October 2024)

2025 Initiatives Related to EGCFE

Asia-Pacific Economic Cooperation

- EGCFE 2025 meeting at Joint Expert Group Meeting in April in Hon Kong, China
- OGSI（APEC Oil and Gas Security Initiatives）

  ①Oil and Gas Security Exercise (OGSE)　The 8th OGSE will be planned for Indonesia in February

  ②Oil and Gas Security Network (OGSN)　The 8th OGSN Forum in Hong Kong, China in April

  ③Oil and Gas Security Studies (OGSS)　OGSS 21

- APEC Workshop on Cleaner and More Efficient Operation of the Fossil Energy Industry (TBC)
- APERC Fossil Fuel Reports 2024: Oil, Coal, Gas, and Hydrogen

- 〔Items Under Consideration〕
  APEC POLICY GUIDANCE TO DEVELOP AND IMPLEMENT CLEAN AND LOW-CARBON HYDROGEN POLICY FRAMEWORKS IN THE ASIA-PACIFIC

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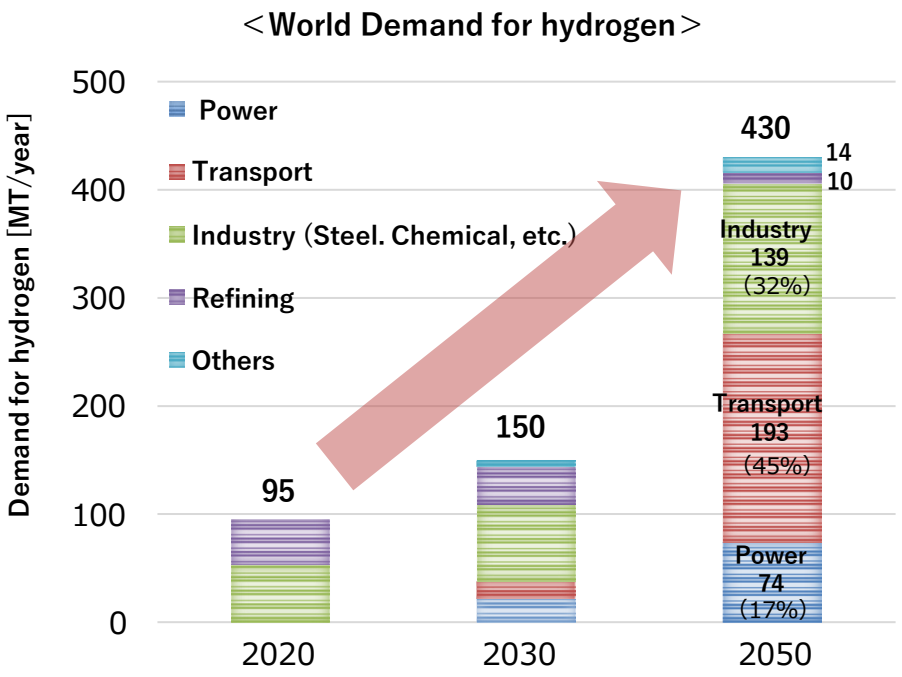
※Together with EGNRET and APERC, we aim to promote this framework. First, we would like to start by having each economy introduce their efforts and best practices regarding hydrogen and its derivatives.

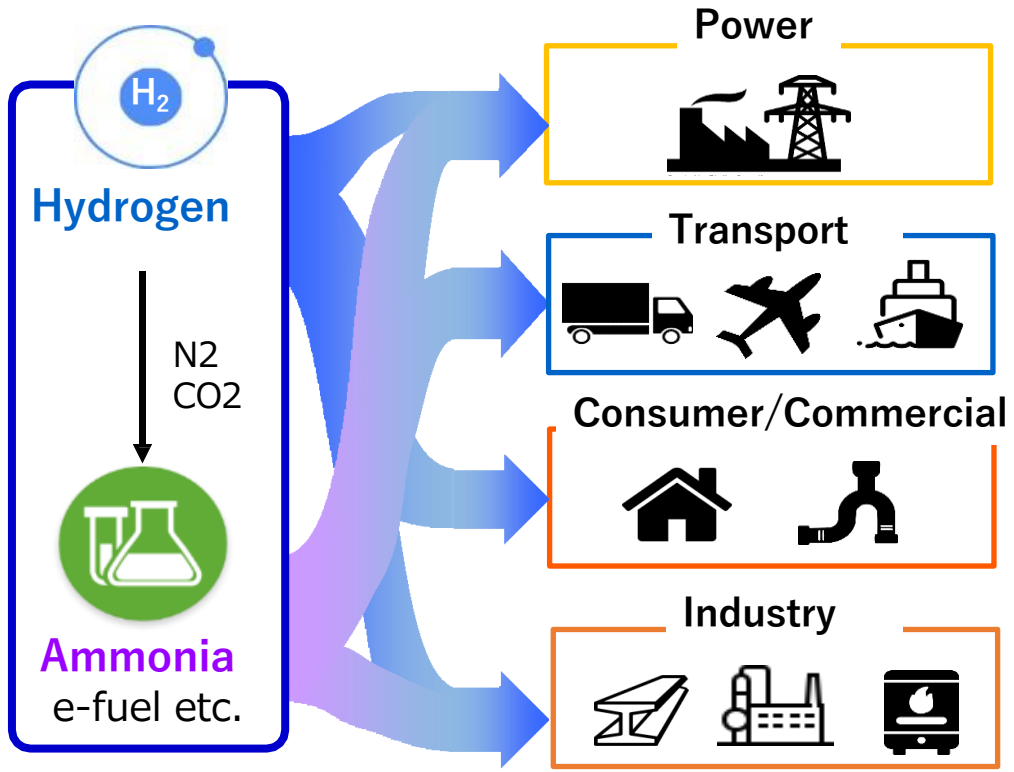
Japan's Efforts Regarding Hydrogen and Its Derivatives

Hydrogen essential for carbon neutrality

- **Global demand for hydrogen and its derivatives (i.e., ammonia, e-methane, and e-fuels) is expected to grow** towards carbon neutrality by 2050.
- They are expected to be utilized in various sectors, including **"hard-to-abate" sectors** such as steel and chemicals, where conversion is difficult due to few alternative technologies, as well as in the **mobility sector** and **power generation**.



Ref : IEA「Net-Zero Roadmap」 (2023/9)
※ Calculated based on NZE (Net Zero Achieved in 2050) scenario



Japan's Hydrogen Policies

- First country to formulate a **national hydrogen strategy, in 2017**, which was then revised in 2023.
- Declared **"2050 carbon neutrality" goal in 2020**.
- Hydrogen/ammonia positioned as one of the priority areas in **the Green Growth Strategy in 2020**.
- Established the **Green Innovation Fund of approximately ¥2 trillion* in 2021**.
  * ¥2 trillion = $13billion (USD/JPY=150)
- Hydrogen (and its derivatives) as **key part of the strategy under the Green Transformation Promotion Act in 2023**.
- Enacted a new **Hydrogen Society Promotion Act in 2024** (enforced on October 23rd).

Milestones

2017
Basic Hydrogen Strategy

2020
- PM's 2050 CN Declaration
- Green Growth Strategy

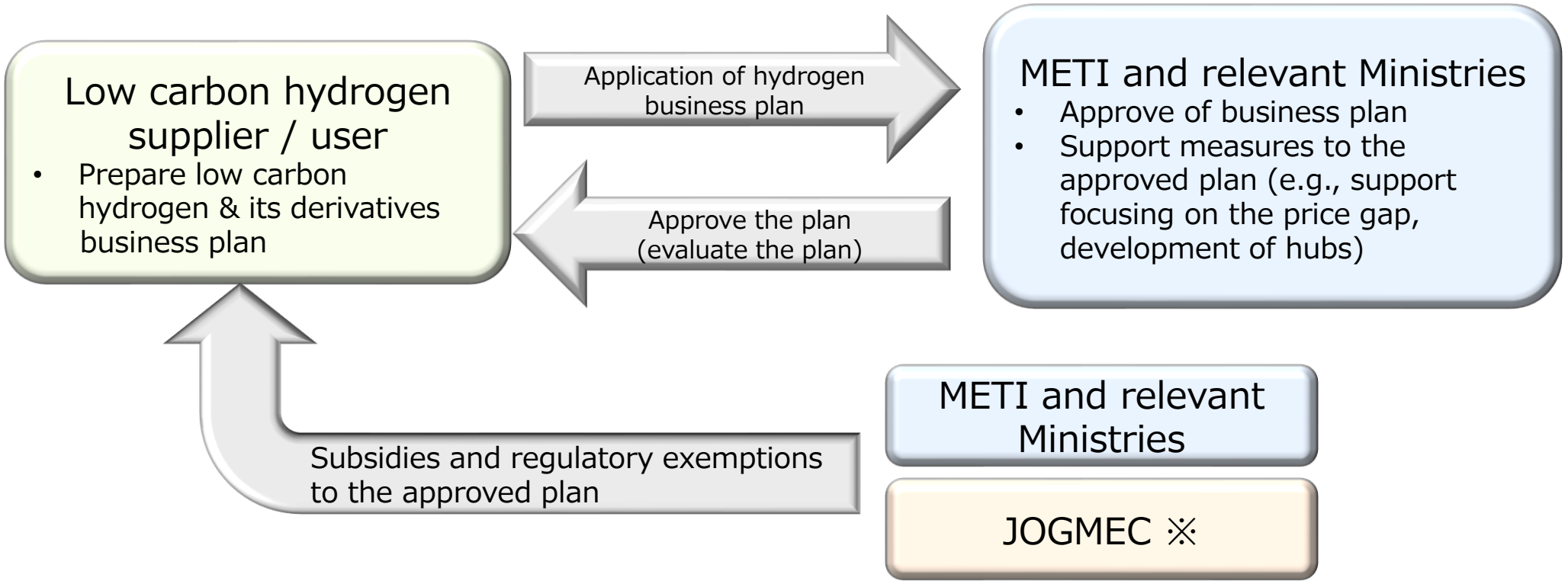
2021
- Green Innovation Fund
- Revised Strategic Energy Plan

2023
- GX Promotion Act
- Basic Hydrogen Strategy updated

2024
Hydrogen Society Promotion Act

Hydrogen Society Promotion Act（Passed on May 17th,2024）

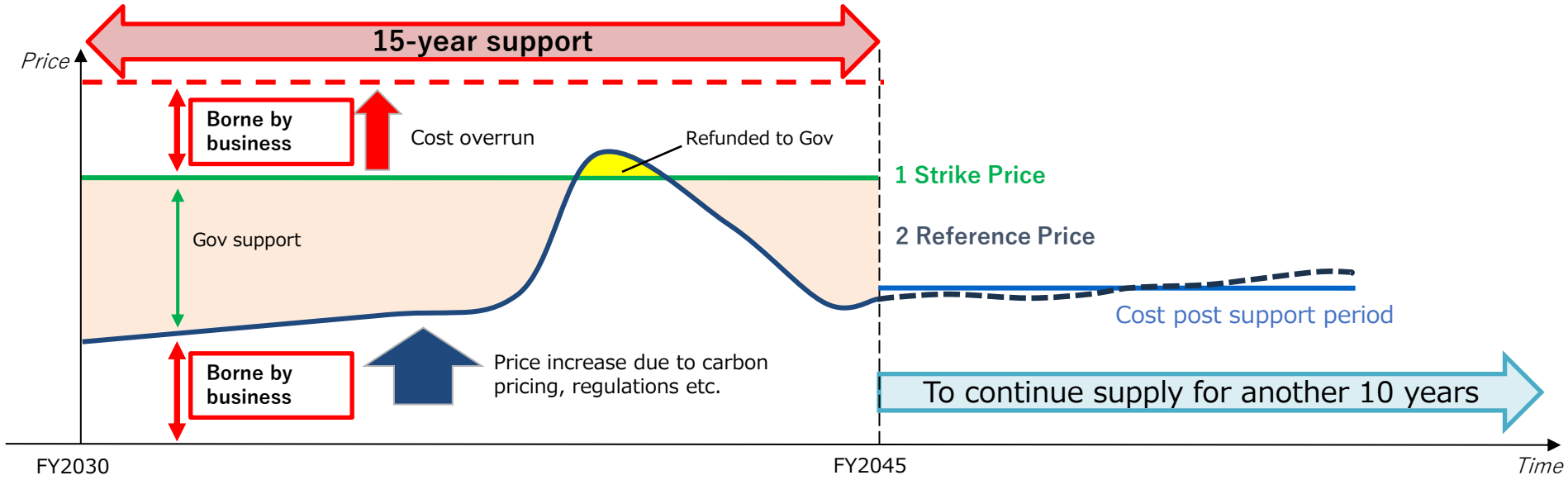
- There are challenges in realizing CN2050 in promotion of GX in hard-to-abate sectors and realization of stable energy supply, decarbonization, economic growth.
- **Hydrogen and its derivatives are key enablers for achieving carbon neutrality** in industrial sectors, including iron and steel, chemicals, mobility and power generation.
- **The Government will provide supporting measures to the approved hydrogen business plans** to promote the supply and utilization of low carbon hydrogen and its derivatives.



※ Japan Organization for Metals and Energy Security

Support Focusing on the Price Gap

- The government plans to provide a 15-year support to **suppliers** who aim to develop a **commercial-scale supply chain** of **low-carbon hydrogen and its derivatives** which meets Japan's primary energy policy. (i.e., S+3E: Safety + Energy Security, Economic Efficiency, Environment)



Key requirements

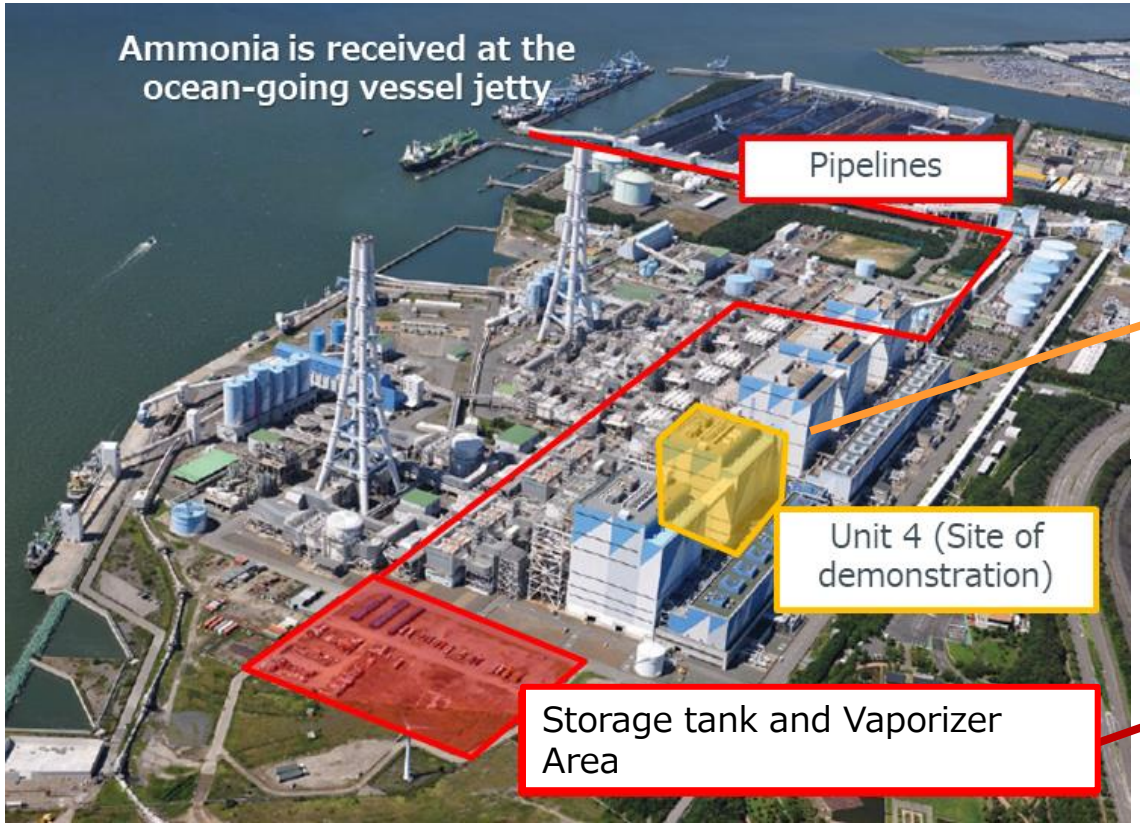
- **Supply to hard-to-abate sectors**, such as steel, chemical and transportation industries
- **Start supply by FY2030 and must continue for another 10 years** following the support period

* In the approval process, business plans are to be reviewed holistically from Japan's energy and GX policy perspectives

Ammonia power generation

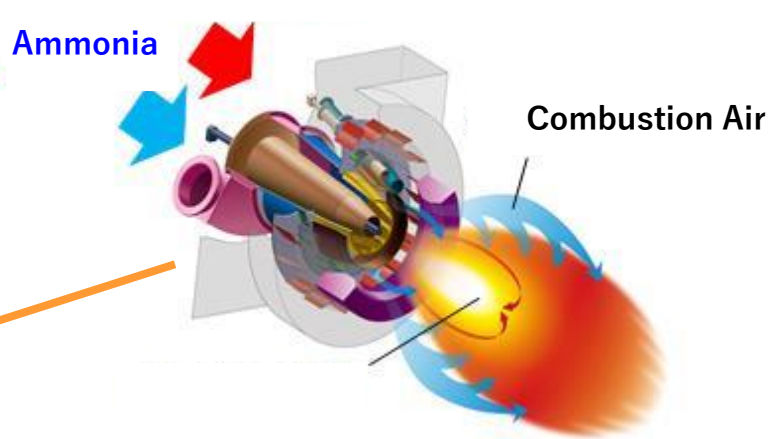
- As Japan's original technology, **stable combustion and reduced NOx emissions with 20% ammonia co-firing have been already achieved**. The **demonstration using actual large-scale equipment (a 1 GW power plant)** was **completed in 2024**.

JERA Hekinan Thermal Power Station



Source: JERA press release, revision by ANRE

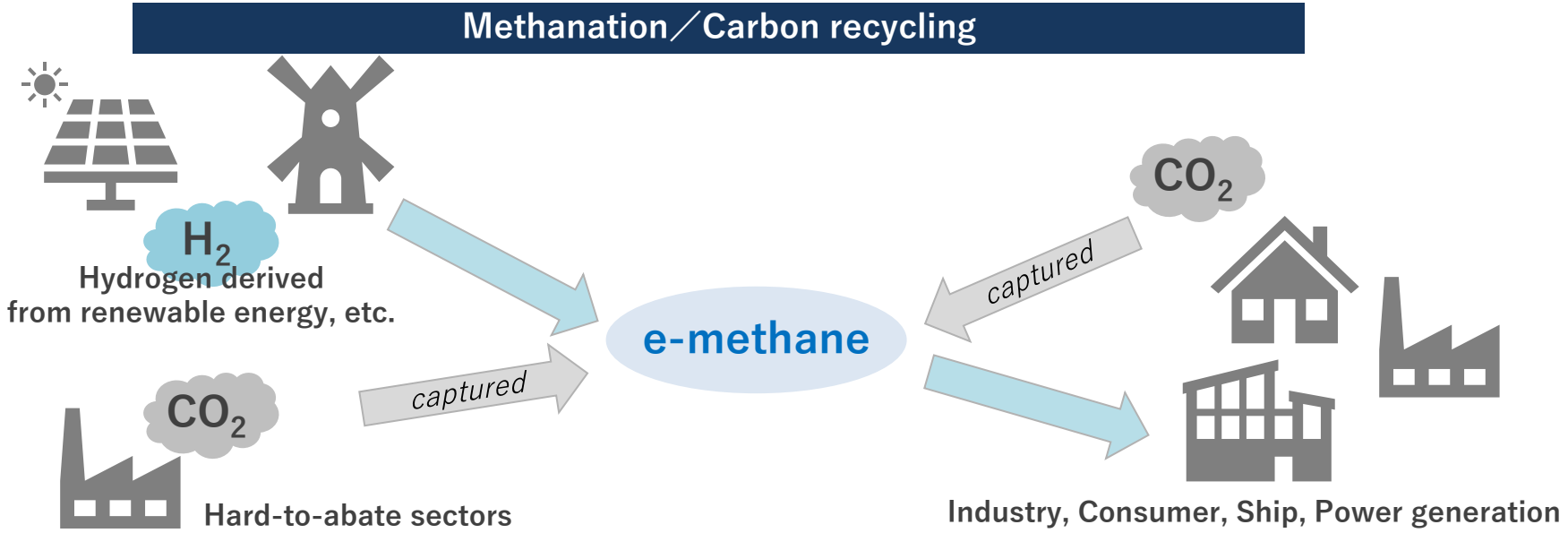
Co-firing burner（image）



Ammonia Storage Tank

e-methane

- **Effective for carbon neutrality in heat demand**
  → *e-methane can achieve decarbonization in the high temperature zone.*
- **Contributing to low carbon and carbon neutrality**
  → *No new CO_2 is additionally emitted.*
- **Existing LNG and natural gas infrastructure** can be used for e-methane.
  → *Decarbonization can be achieved while keeping equipment costs down.*



Future direction in Strategic Energy Plan (2021)
→ Inject 1% e-methane into existing infrastructure by 2030

Global e-methane projects

- **e-methane projects are being promoted by companies around the world.**

Nordic Ren-Gas
Construction to begin in 2025-27

- **Shell,** Tokyo Gas, Osaka Gas – supply chains study
- **ENGIE**, Osaka Gas – MOU for Asian market
- **Total Energies**, Toho Gas, Toyota Tsusho Corp - FS

INPEX, Masdar, Tokyo Gas, Osaka Gas – FS in UAE

TES, Tokyo Gas, Osaka Gas, Toho Gas, Mitsubishi Corp., engie, Sempra, Total Energies

e-NG COALITION

IHI, Pertamnia – FS near existing LNG plants

Osaka Gas, IHI, Petronas FS (biogenic e-methane)

Santos, Tokyo Gas, Osaka Gas, Toho Gas– Pre-FEED (Cooper Basin)

Green Plains
TALLGRASS ENERGY
Daigas Group

Osaka Gas, Tallgrass Green Plains – FS in U.S. Midwest

Mitsubishi Corporation, Tokyo Gas, Toho Gas, Sempra Infrastructures Partners
- FS Cameron LNG terminal

https://www.inpex.co.jp/news/2023/2023-7_b.html
https://www.tokyo-gas.co.jp/news/press/20240319-02.html
https://www.meti.go.jp/shingikai/energy_environment/methanation_suishin/pdf/010_05_05.pdf
https://www.ihi.co.jp/all_news/2022/resources_energy_environment/1198113_3473.html

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Thank you for your kind attention.

We would like to see more Project Proposals coming through EGCFE.