METI
Ministry of Economy, Trade and Industry

Low-carbon gases in Japan's Strategy reaching Net Zero by 2050

March 2022

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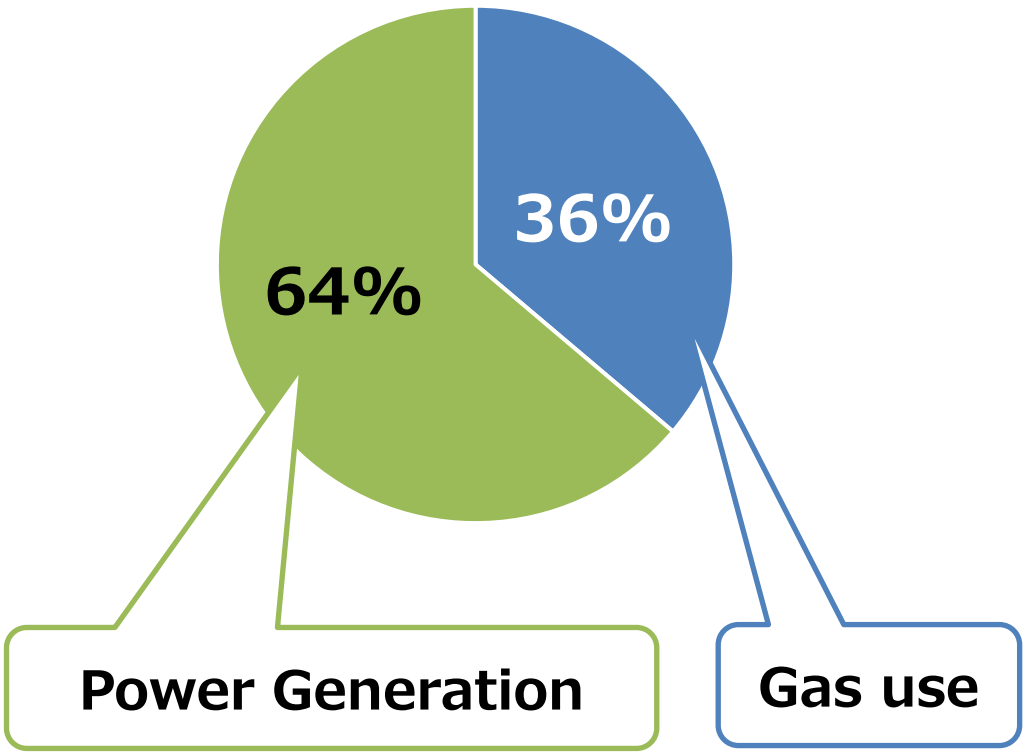
the Ministry of Economy, Trade and Industry (METI)

Overviews on gaseous energy uses in Japan

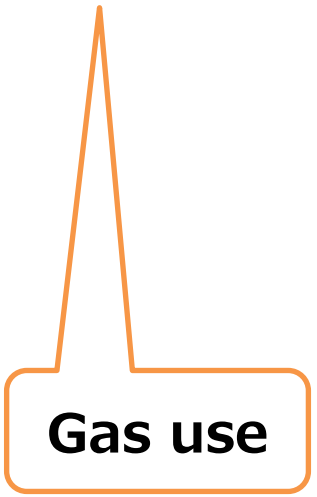
LNG Consumption

73 million tons（FY2019）

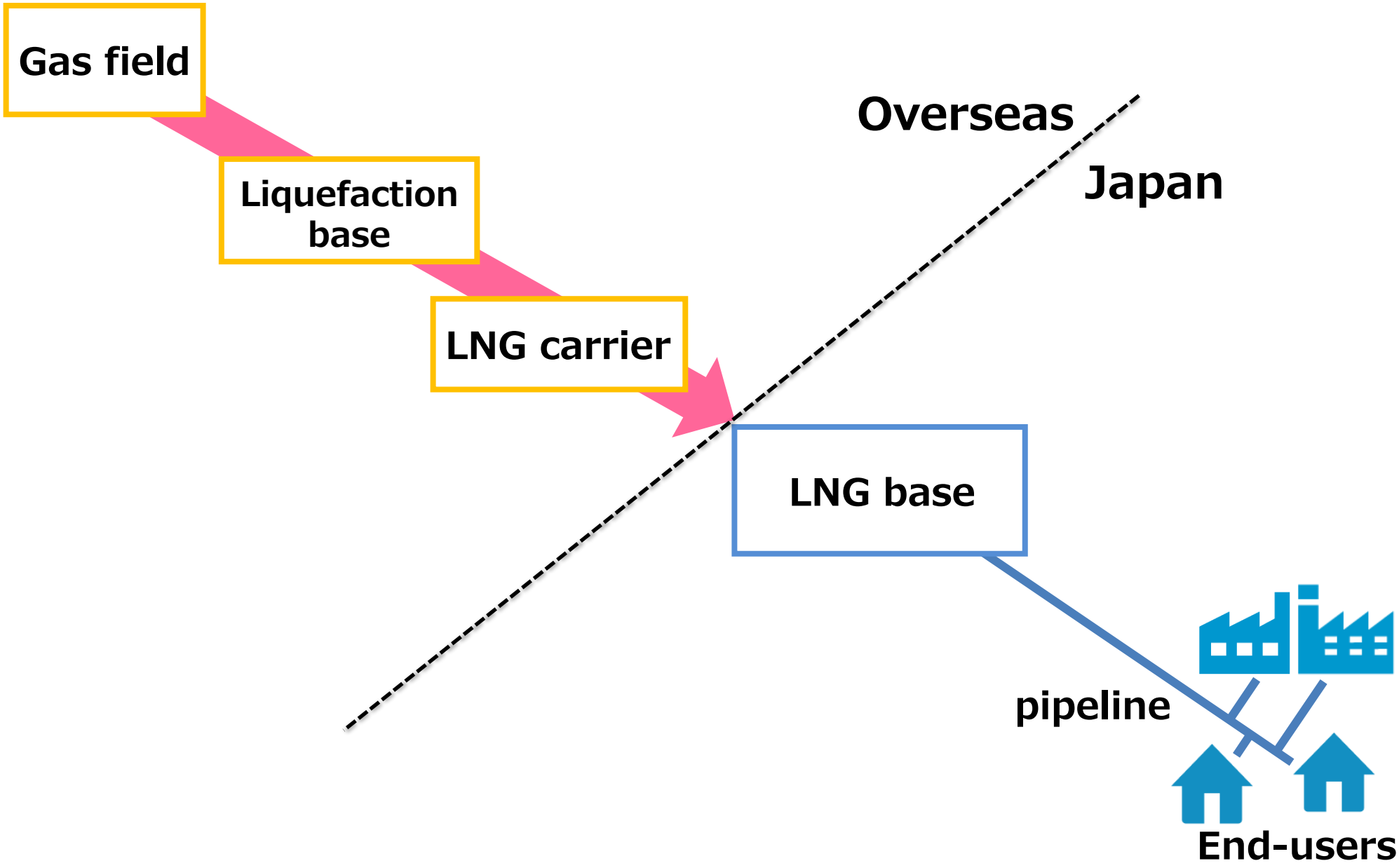


LPG Consumption

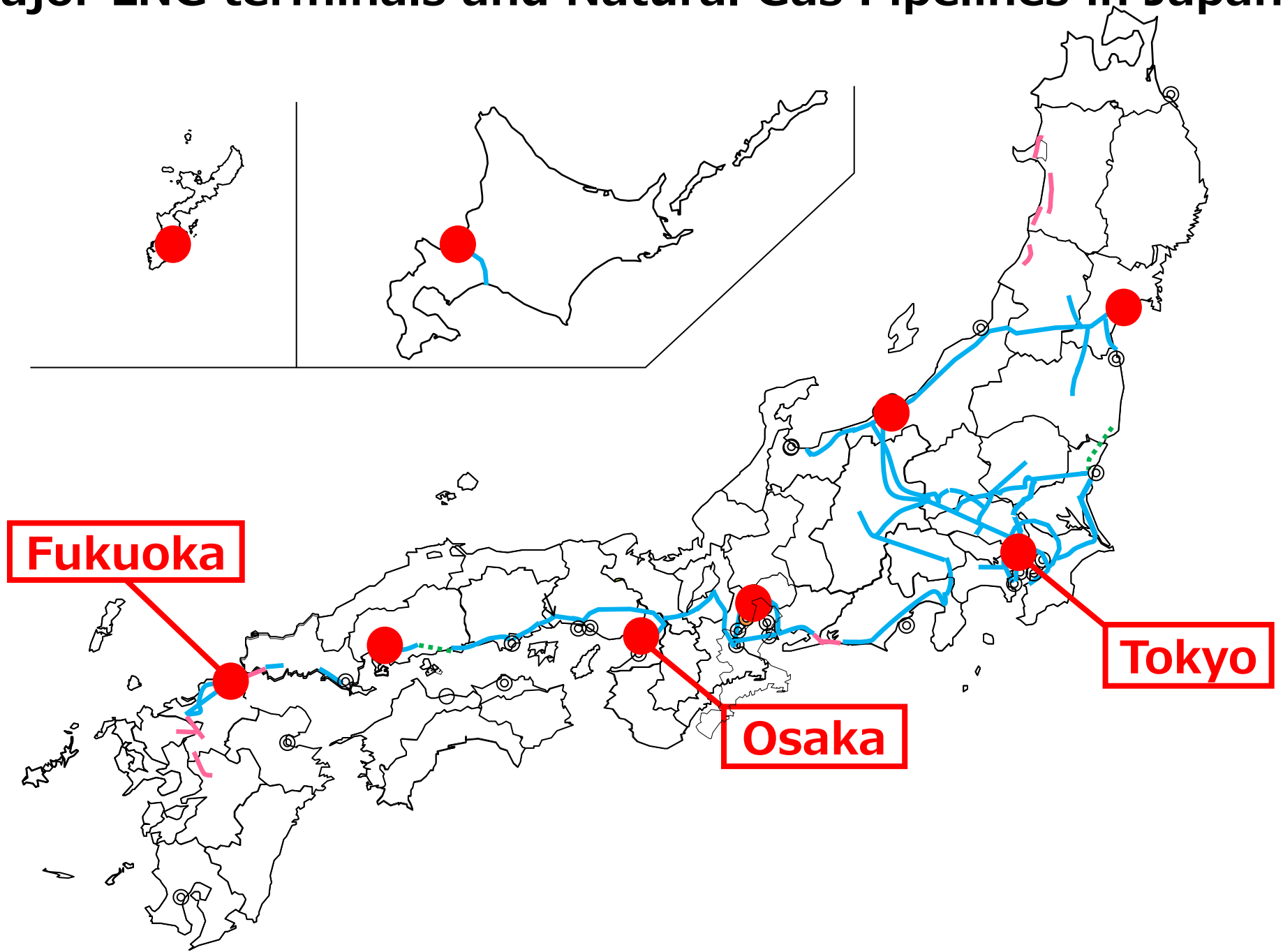
14 million tons（FY2019）



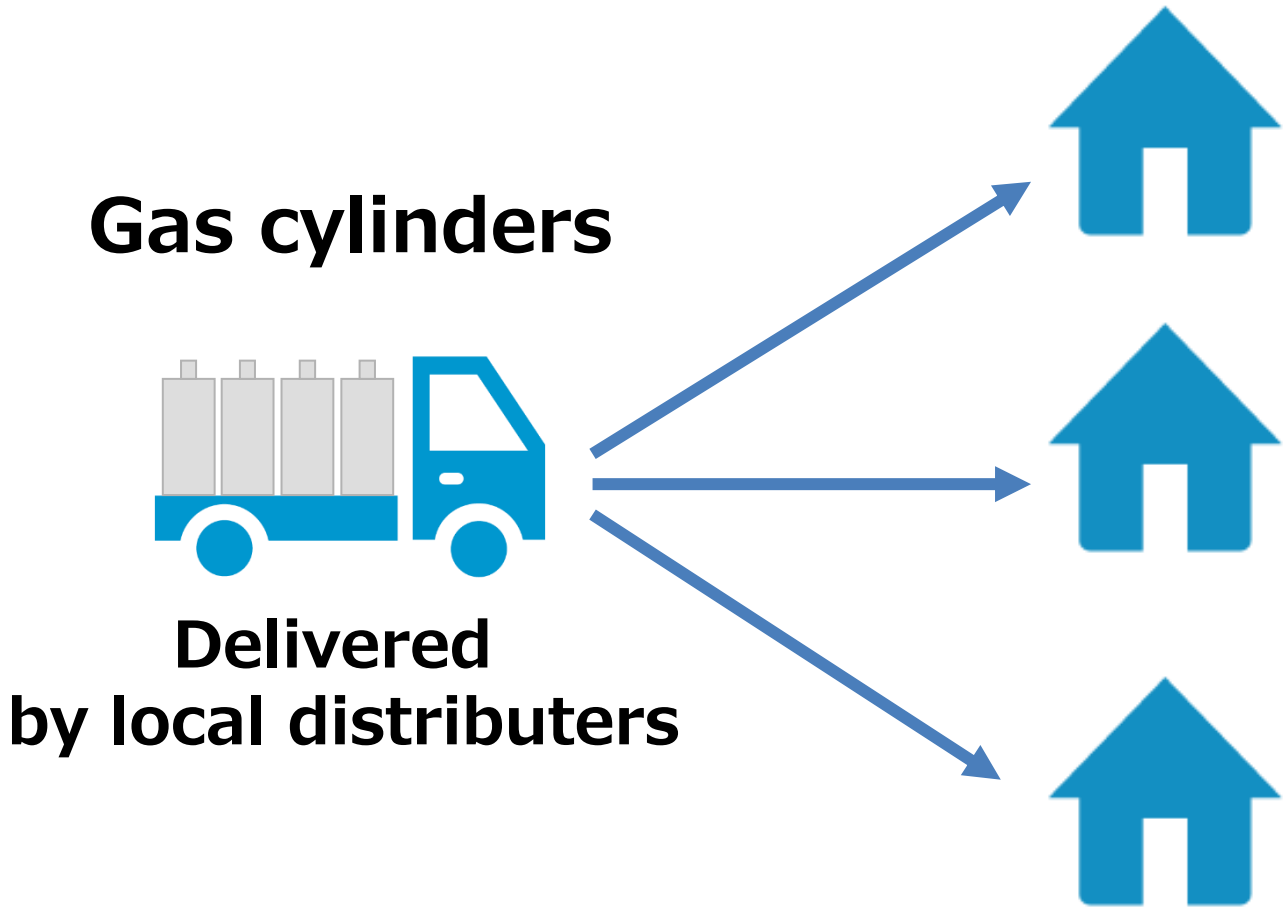
Value Chain of the City Gas Business



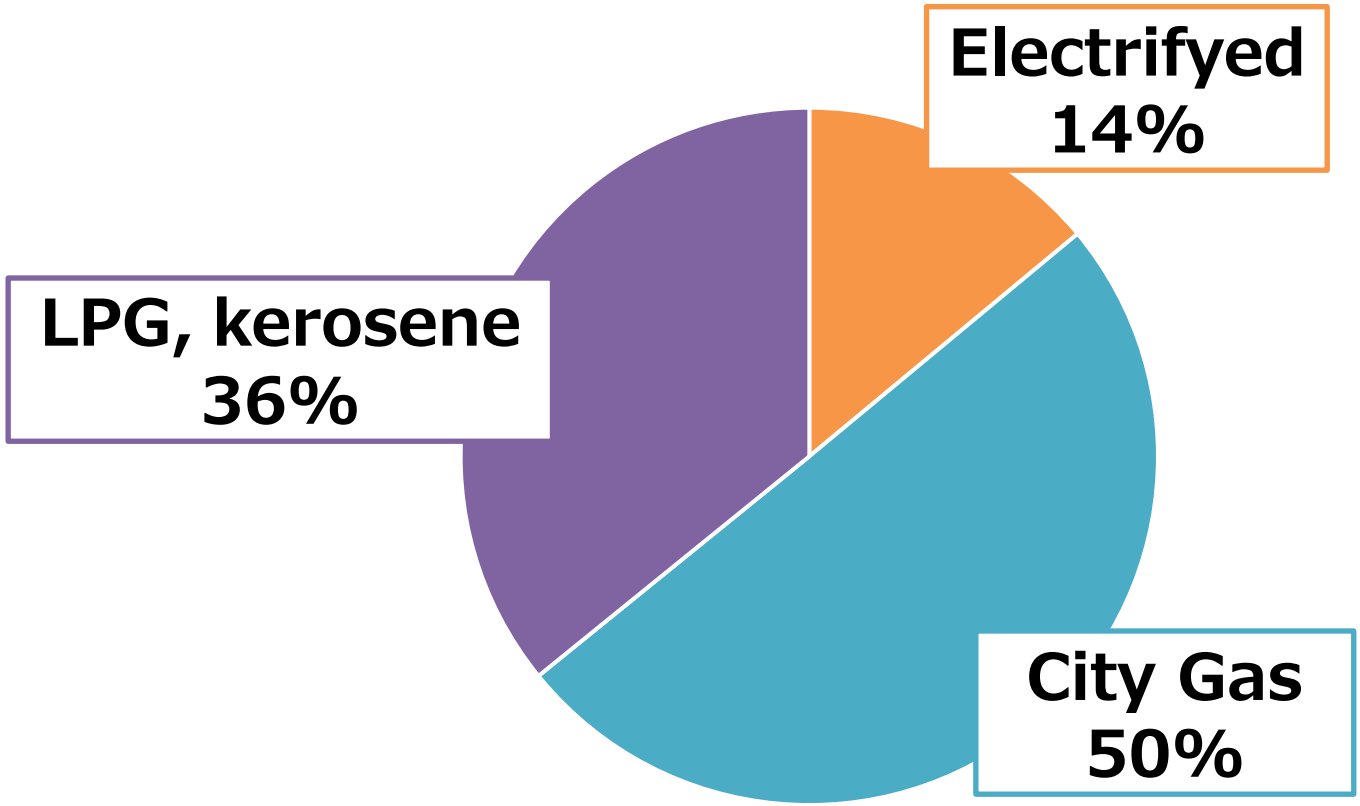
Major LNG terminals and Natural Gas Pipelines in Japan



LPG Distribution in Japan



Heat and Hot-water supply for household in Japan



The Government strategy toward 2050

Jun.2021 : the Green Growth Strategy

Oct. 2021 : the 6th Strategic Energy Plan

Soon : the Clean Energy Strategy NEW

Energy supply-demand structure in the carbon neutral era in 2050

Efficiency in energy consumption will be improved by thoroughly advancing energy efficiency. In addition, the power sector will be decarbonized through introducing decarbonized power sources. Areas of the non-power sector that can be electrified will be electrified by decarbonized power sources.

In the industrial sector, decarbonization will be promoted through the practical application of hydrogenreduced iron making, CO2 absorption type concrete, cement capturing CO2, and artificial photosynthesis. On the other hand, in sectors such as with high-temperature heat demand where electrification is not feasible, decarbonization will be promoted through the use of hydrogen, synthetic methane, biomass, etc.

In the commercial and residential sectors, electrification will be promoted, and decarbonization will also be promoted through the use of renewable heat, hydrogen, synthetic methane, etc.

In the transport sector, decarbonization will be promoted through the expanded introduction of EVs and fuel cell vehicles (FCVs), along with the use of synthetic fuels that utilize CO2.

Despite the progress in energy efficiency and decarbonization in each sector, there are some sectors where CO2 emissions are unavoidable. CO2 from those sectors can be removed by specific measures such as Direct Air Carbon Capture and Storage (DACCS), Bio- Energy with Carbon Capture and Storage (BECCS), and forest sink measures.

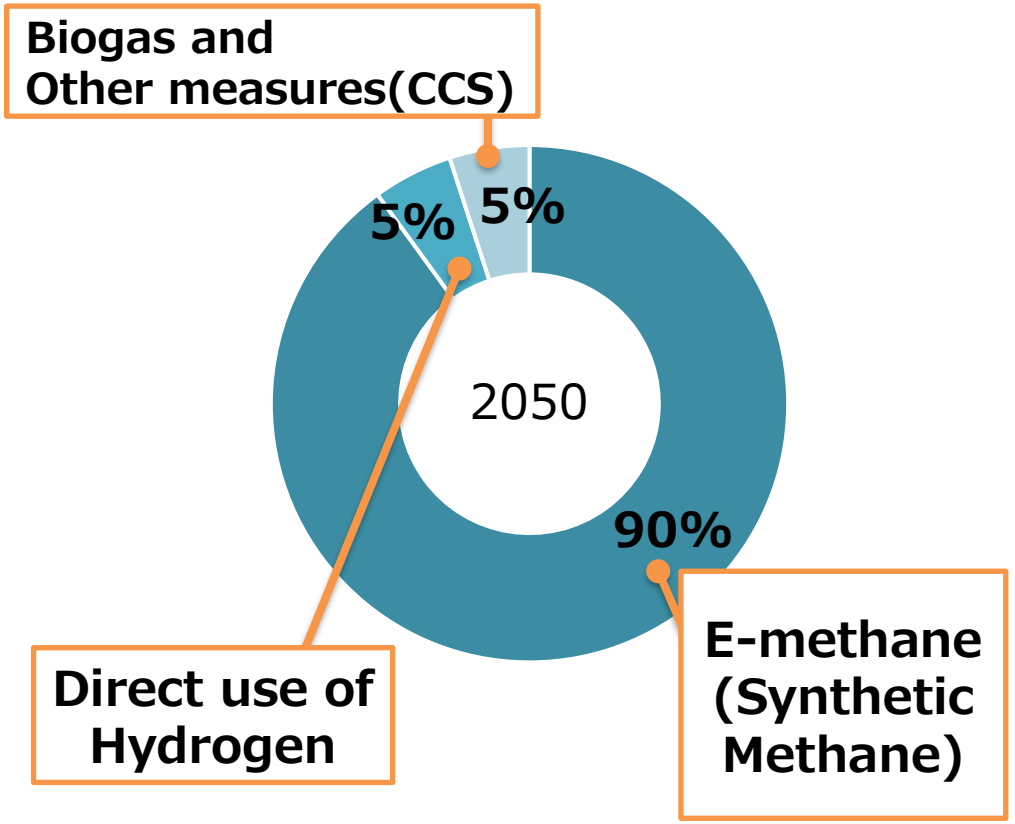
Total power generation mix as an ambitious goal in 2030

renewable energy	36～38%
Hydrogen and ammonia	1%
Nuclear	20～22%
LNG	20%
Coal	19%
Oil	2%

Targets in 2050

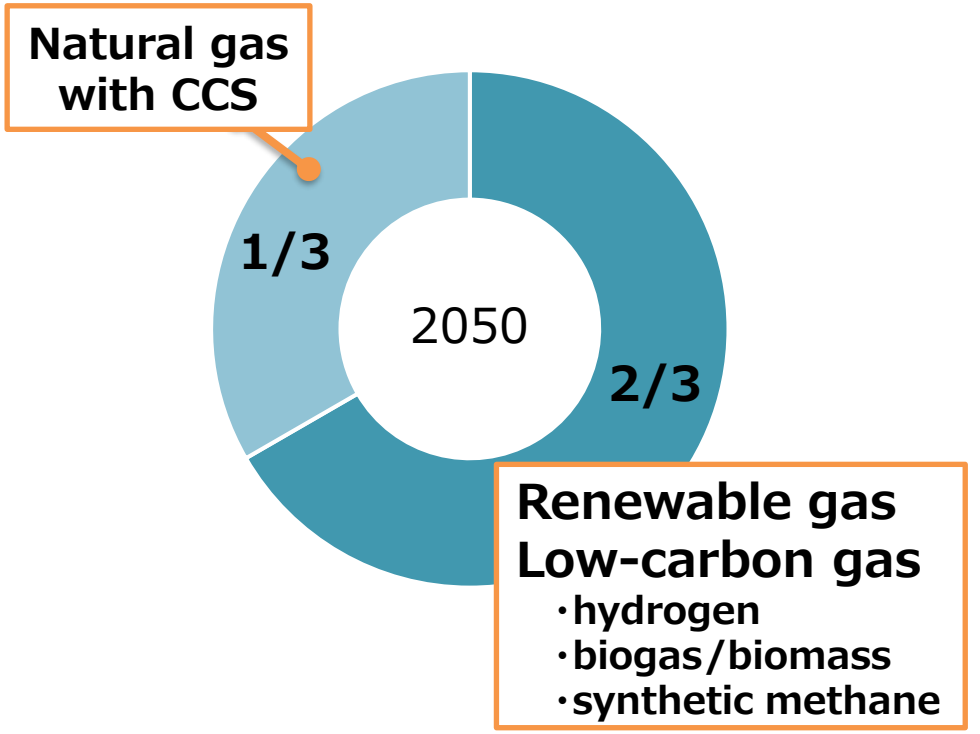
JAPAN
The Green Growth Strategy
The 6th Strategic Energy Plan

City Gas consumption of gaseous fuels



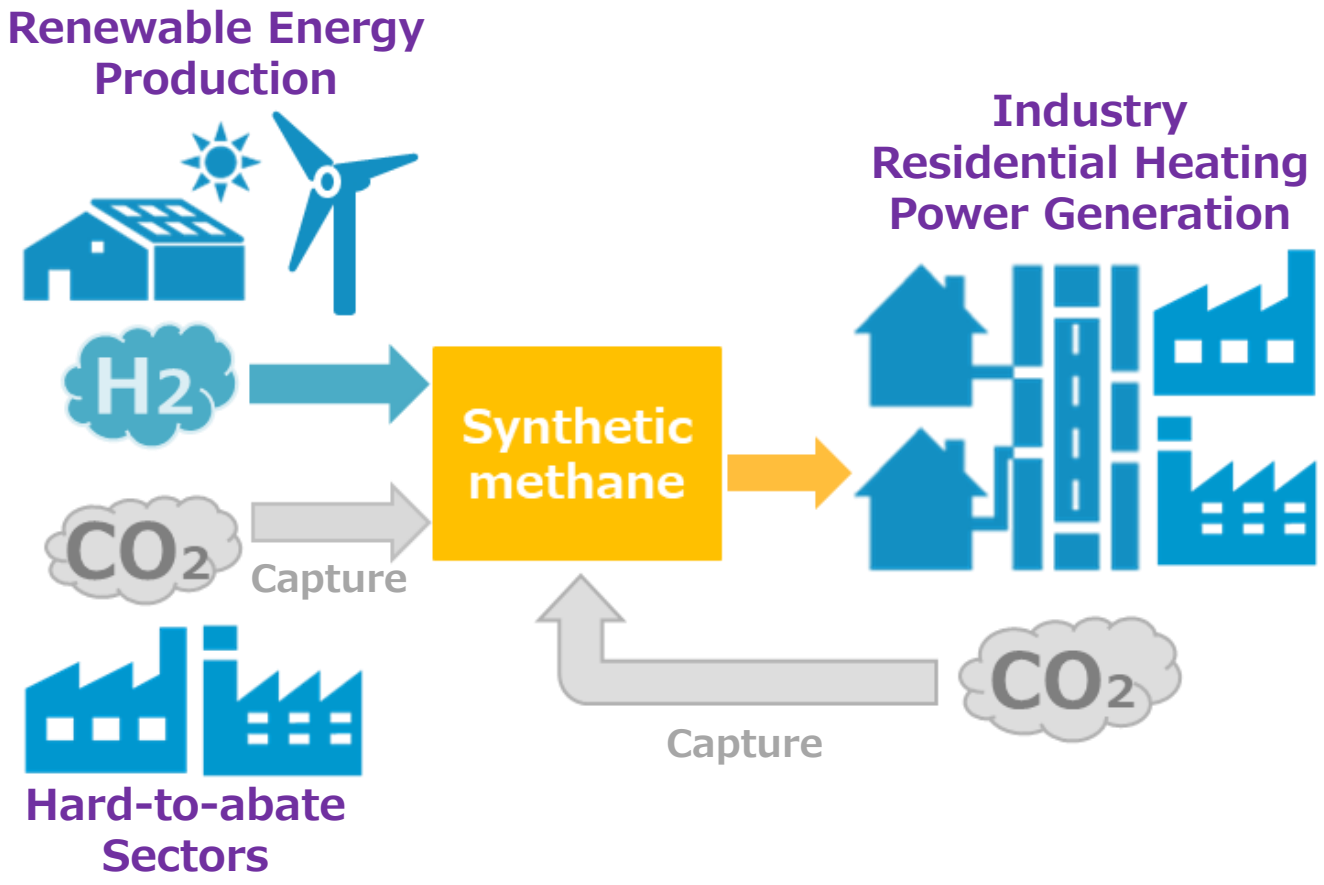
European Commission
Hydrogen and Decarbonized Gas
Package on Dec 15, 2021

Total consumption of gaseous fuels

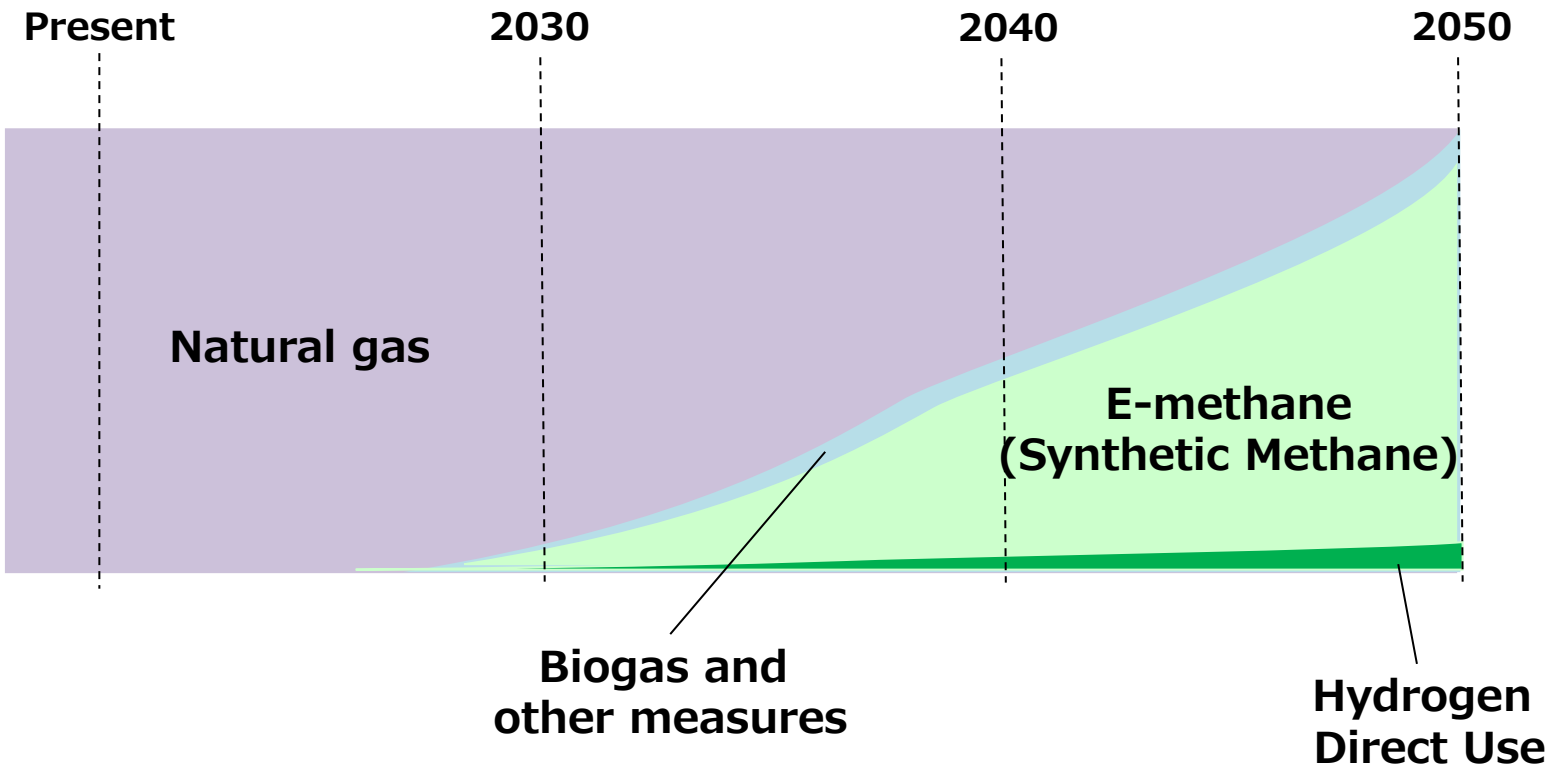


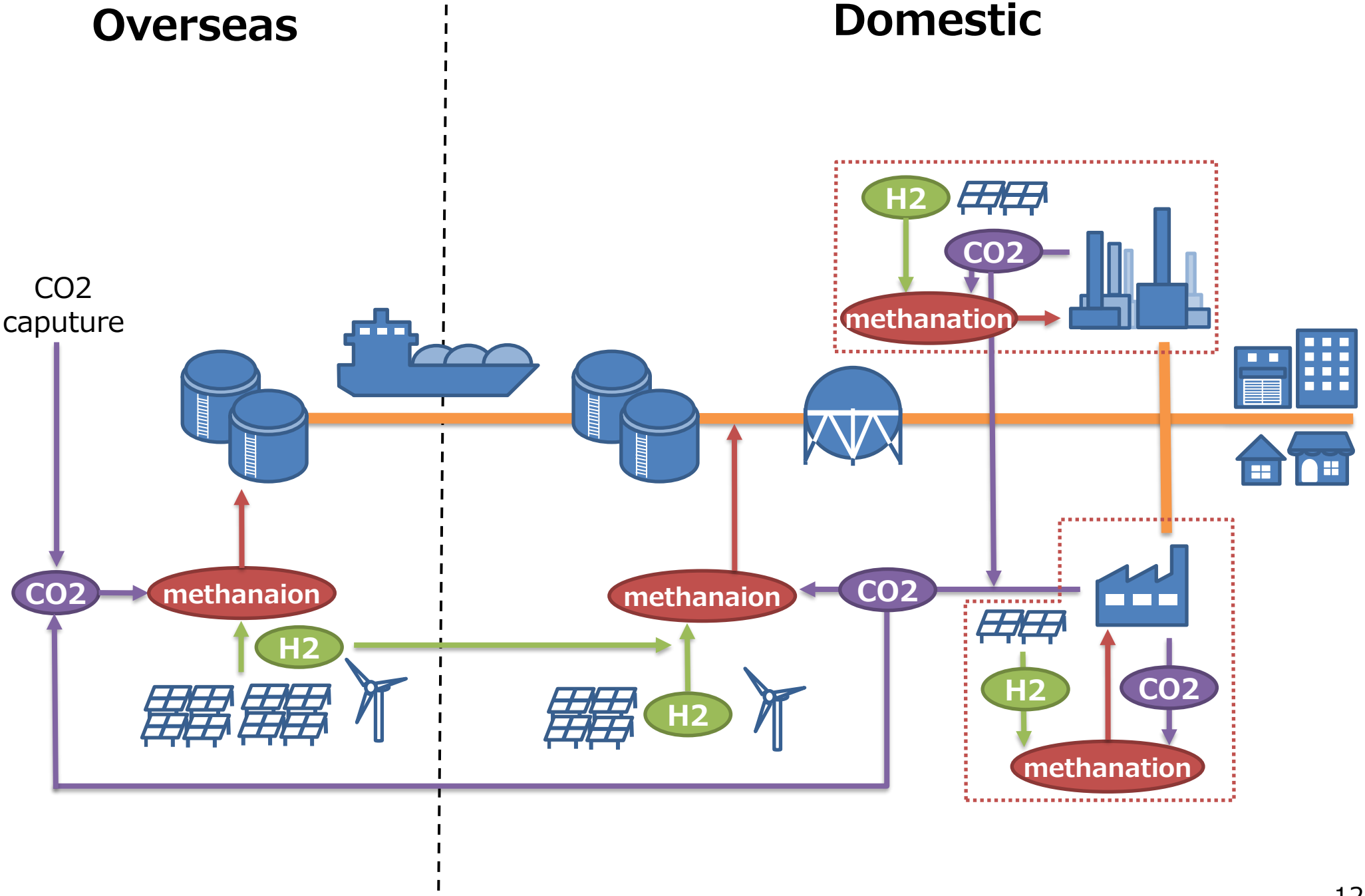
Characteristics of E-methane (Synthetic methane)

E-methane can seamlessly and flexibly be phased into the existing gas supply chain according to availability.



Transition of gaseous energy in City Gas

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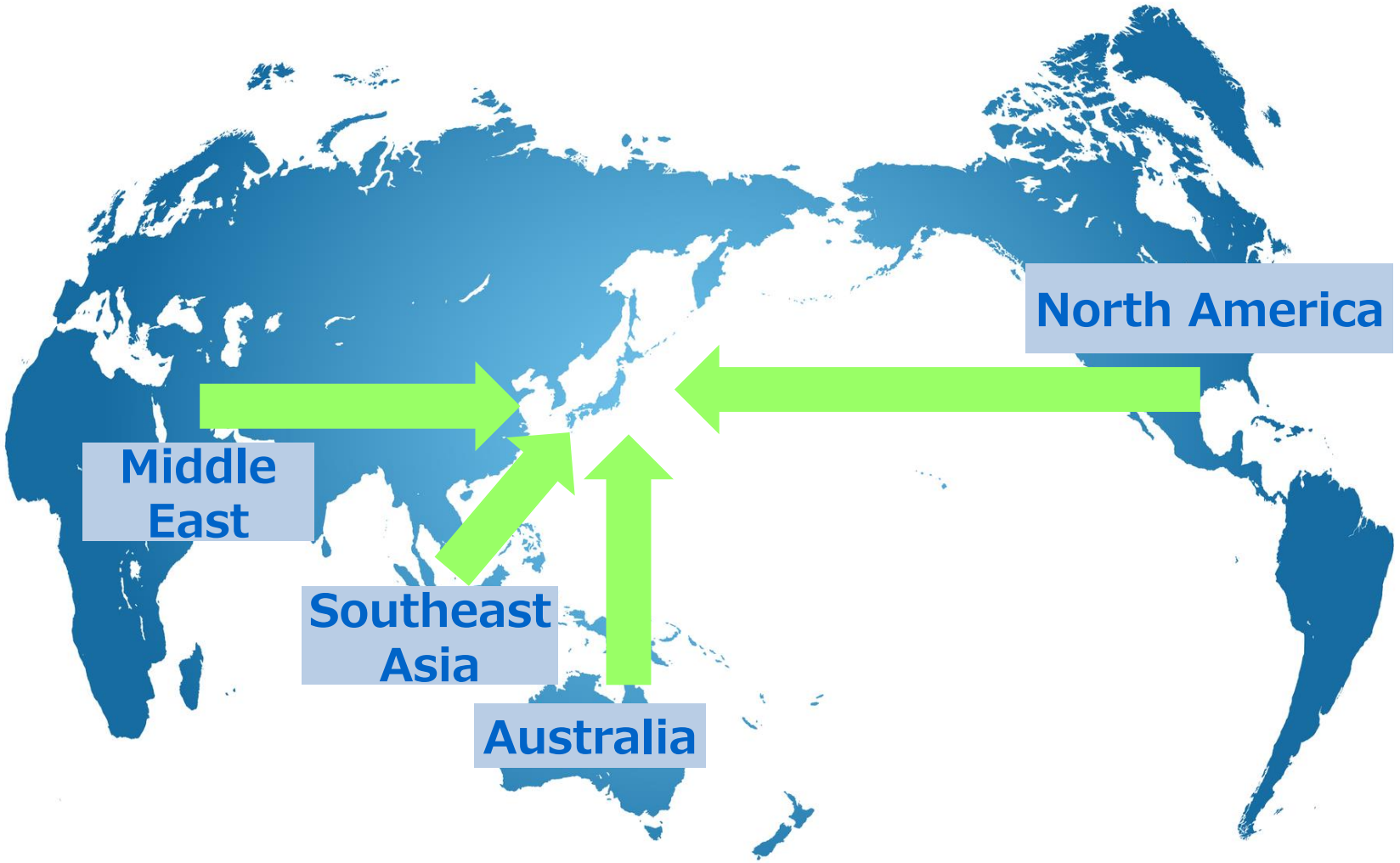
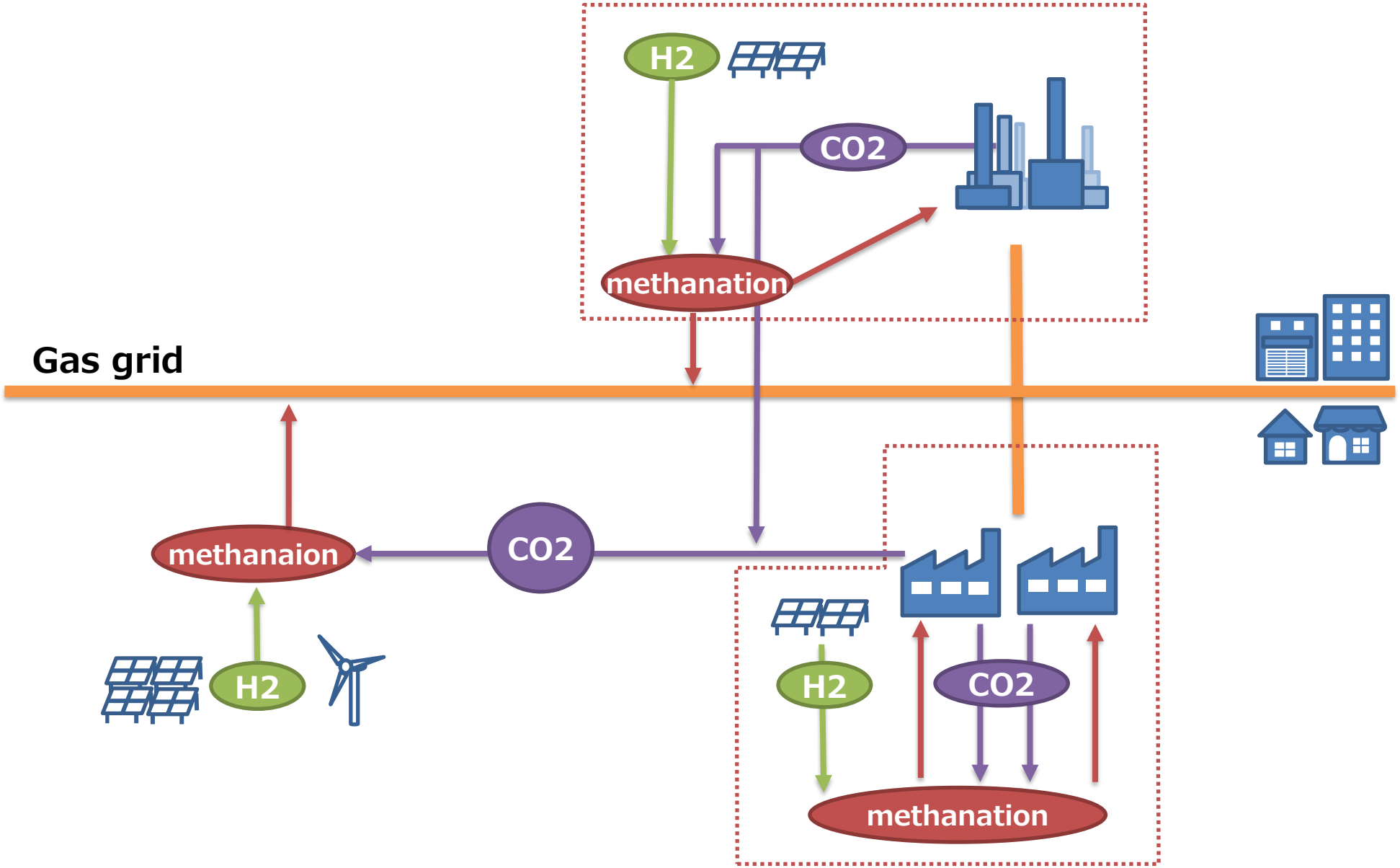
Expected international supply chain of E-methane



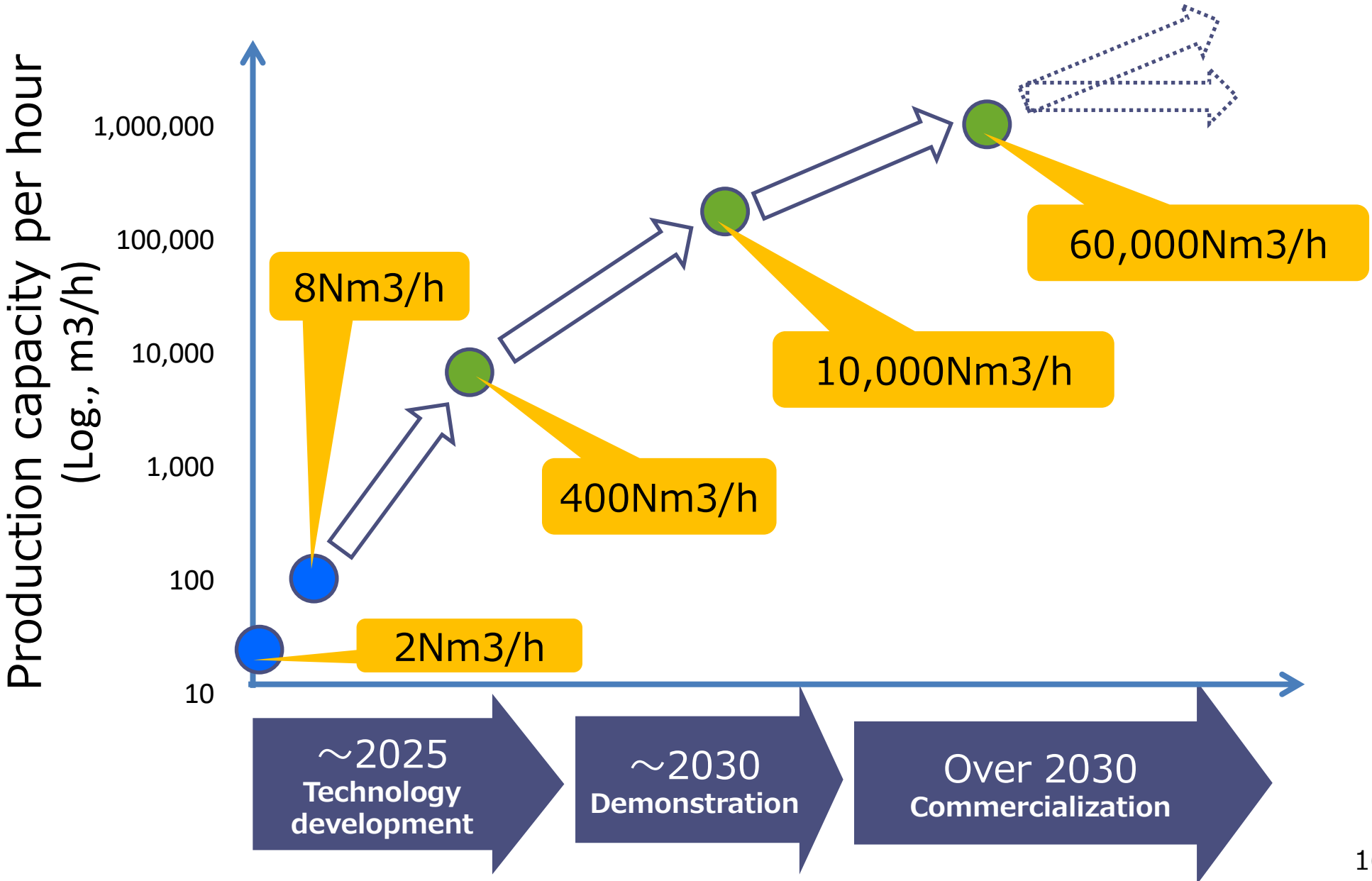
Domestic methanation based on carbon recycle



Three Challenges for E-methane (synthetic methane) use

1. **Cheap renewable electricity or renewable hydrogen**
2. **Mass production technology and Cost reduction**
3. **International rules for recycled carbon fuels, including E-methane (Synthetic methine)**

Methanation Scale-up Road map



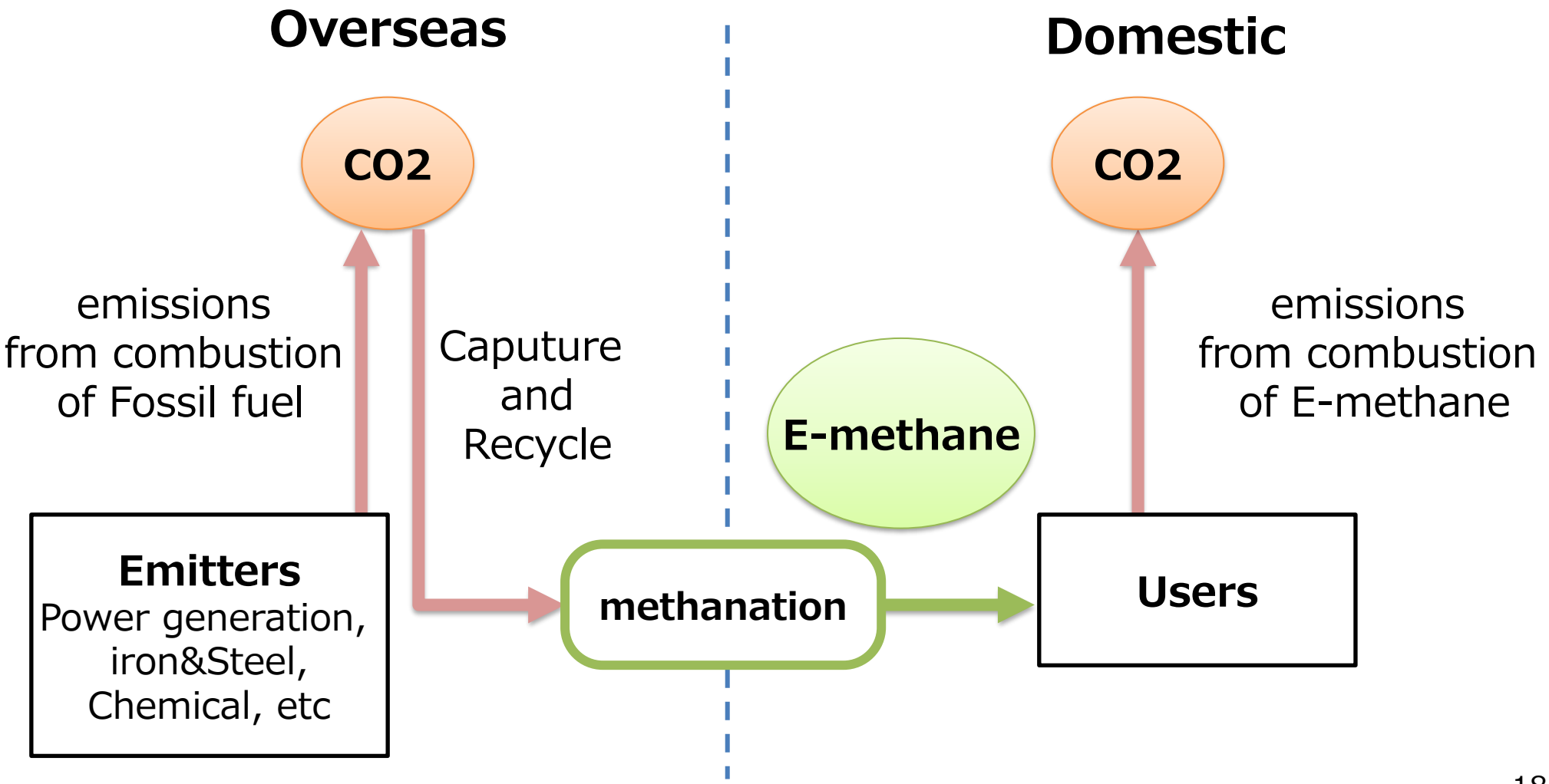
E-methane use target in 2030

- The target in 2030 is to inject **1% of the gas supply by E-methane**.
- The volume is as follows. (1% of 2020FY city gas sales volume base.)

	in 2030
Tokyo Gas	80 million m3/year (Hydrogen 2.9 k-tons)
Osaka Gas	60 million m3/year (Hydrogen 2.2 k-tons)

International rule on RCFs is important

- We should avoid double count of CO2 emission form E-methane and E-fuels.

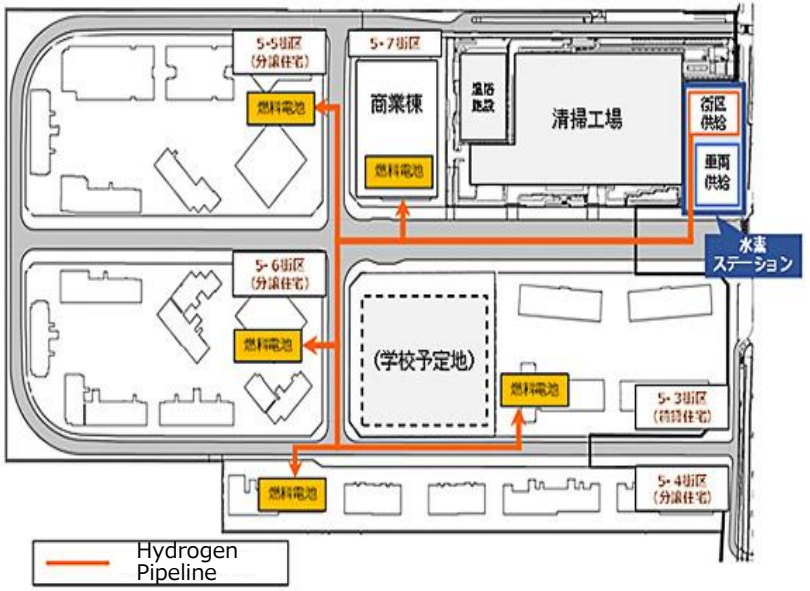


Direct Hydrogen use case by Tokyo Gas

New residential zone development after the Tokyo Olympic Game 2020

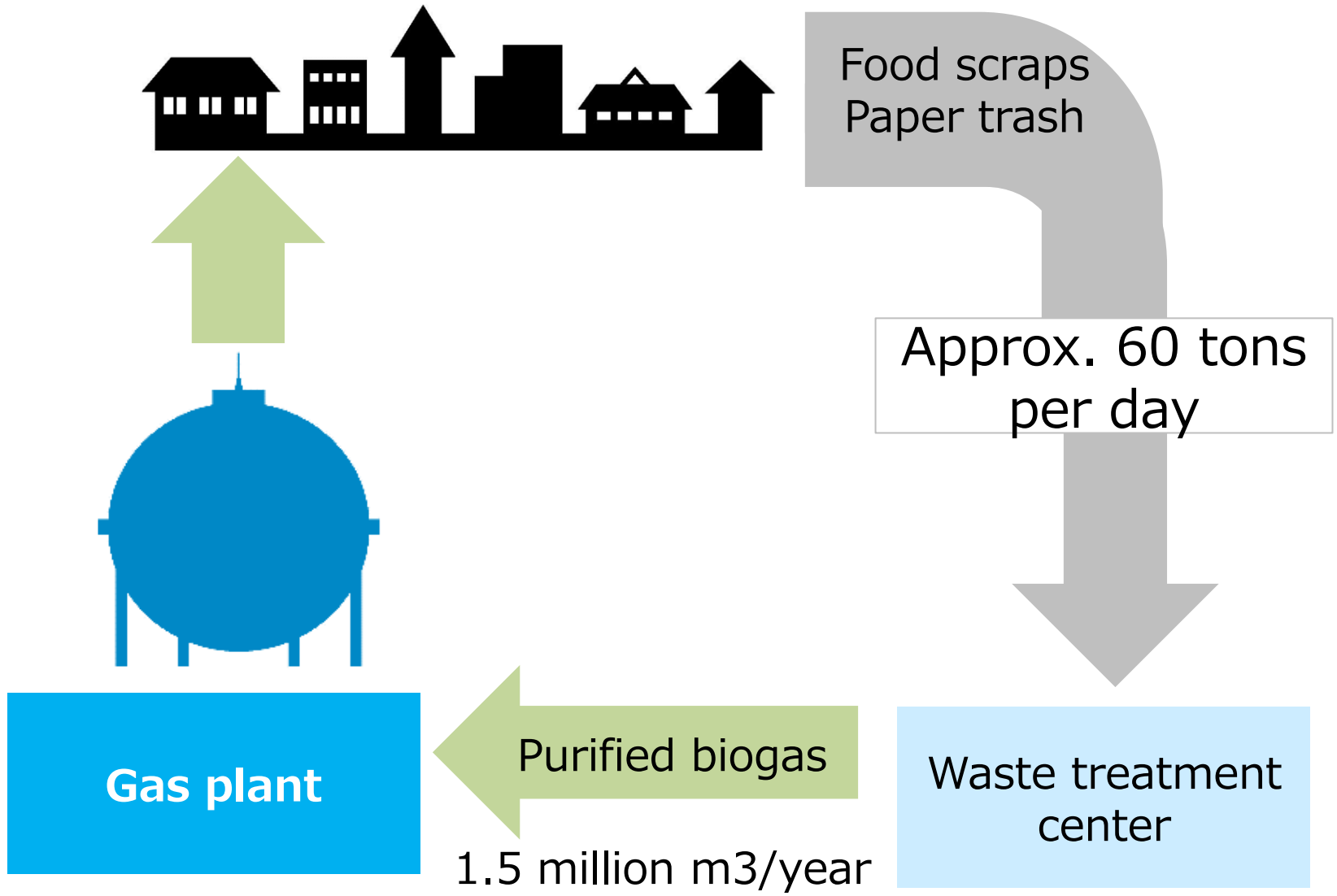
*Excerpt from Tokyo Metropolitan Government's "Development Plan for Community Development in Olympic Village after the Tokyo 2020 Games"

H2 delivered by pipeline (planned)



*Excerpt from Tokyo Metropolitan Government's "Athlete Village District Energy Improvement Project"

Biogas use case in Kagoshima City, Kyushi



Thank you for your attention