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The 4th International Conference on Carbon Recycling

Practical Application of Synthetic Methane for Carbon Neutrality



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Daigas Group Overview

As of March 2022

Commencement of business operations	1905
Group employee	20,961
Osaka Gas employee	3,189

Total customer accounts 9.8 million
 Gas 4.9 million
 Electricity 1.6 million



Gas supply area in the Kansai region

Domestic Energy

Production, supply, and sales of city gas, gas appliance sales, gas pipeline construction, LNG sales, LNG transport, LPG sales, industrial gas sales, power generation and sales, etc.

International Energy

Natural gas and other resource project development and investment, energy supply, etc.

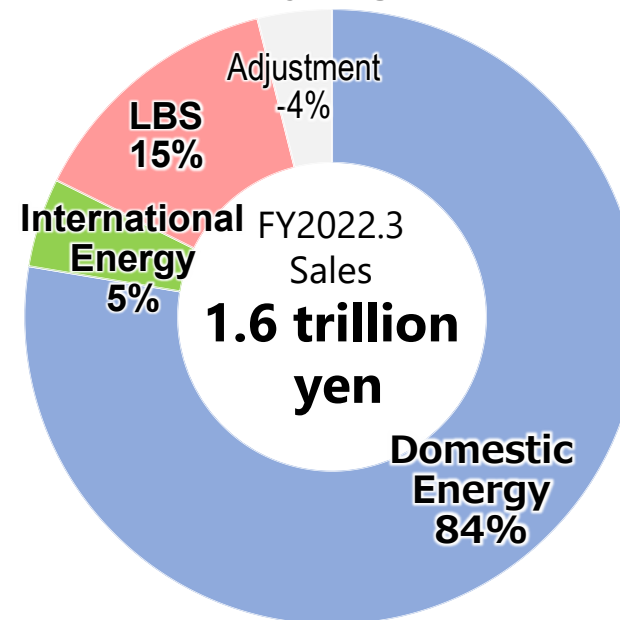
Life and Business Solutions (LBS)

Real estate asset development and leasing, IT services, sales of fine materials and carbon materials products, etc.

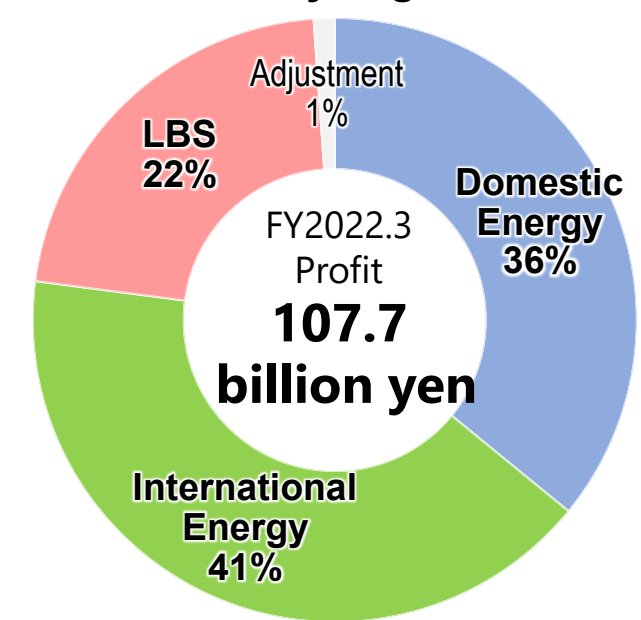
Gas sales volume
7.1 billion m³

Power sales volume
16.8 billion kWh

Sales by segment

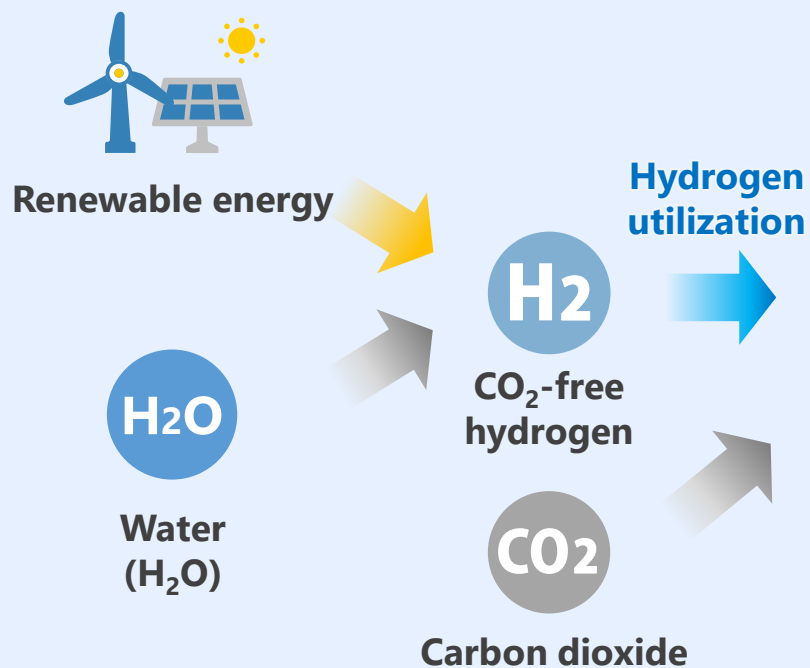


Profit by segment



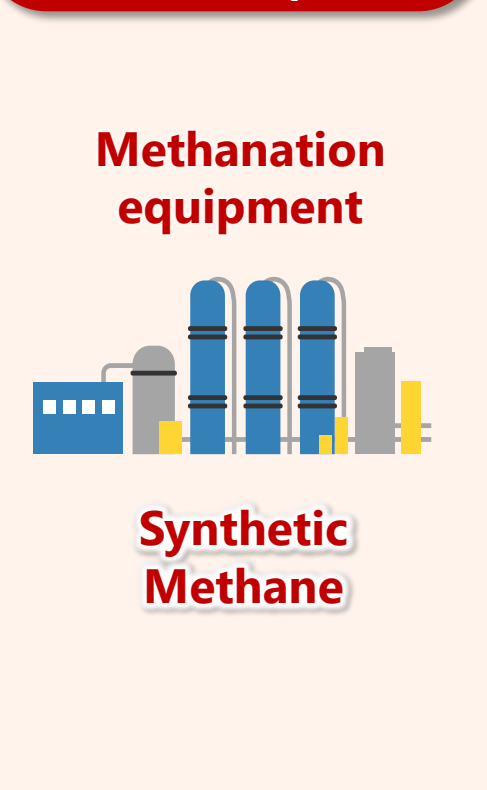
Scenario for becoming carbon neutral featuring methanation

Synthetic Methane Generation with CO₂ and hydrogen produced using renewable energy

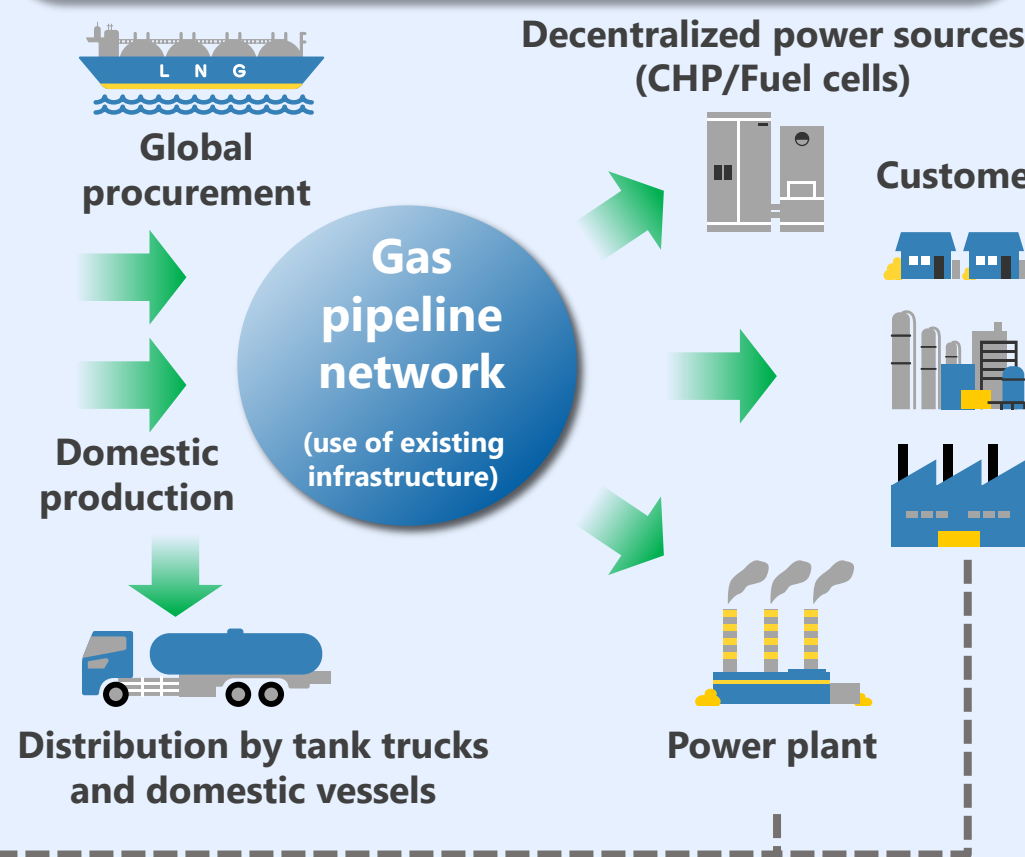


Supply Chain of Synthetic Methane

Target for Commercial Operation



Already in Commercial Operation as LNG/Gas Infrastructure



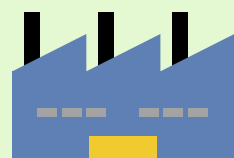
CO₂ capture, utilization and storage (CCUS)

Commercialization of Methanation Technology by 2030

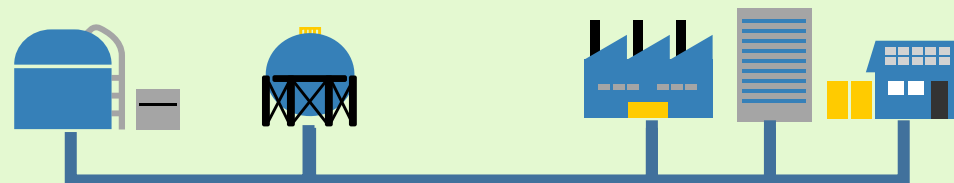
Commercialization of Methanation Technology by 2030

The Daigas Group's 2030 target: **1%* synthetic methane** in the gas grid

* ~60 million m³ (based on the gas sales volume in fiscal 2020)



Introduction



Synthetic methane production

Gas distribution and utilization

Value 1

Decarbonized heat demand

Value 2

Reduced social costs

Value 3

Enhanced energy security

Value 4

Carbon neutral Asia

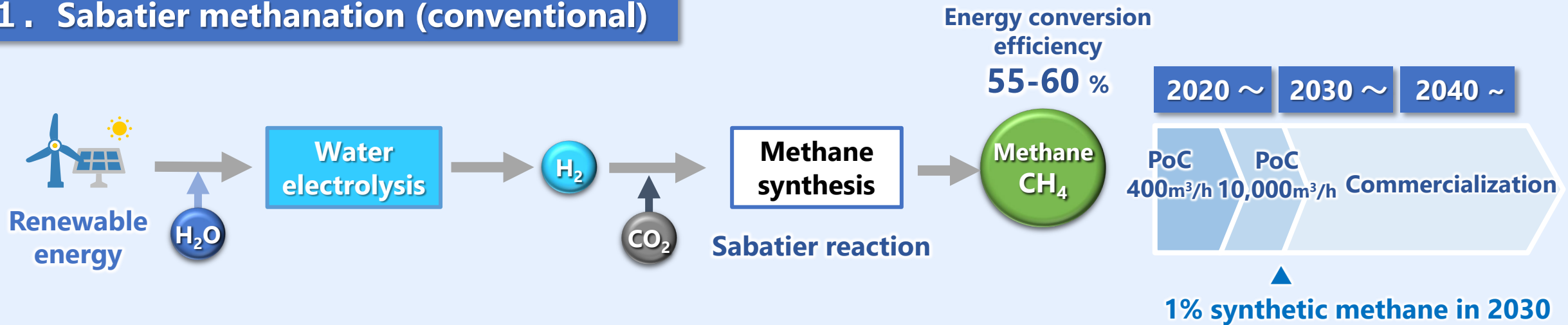
Practical application of methanation technology

Alliances with partners in Japan and overseas

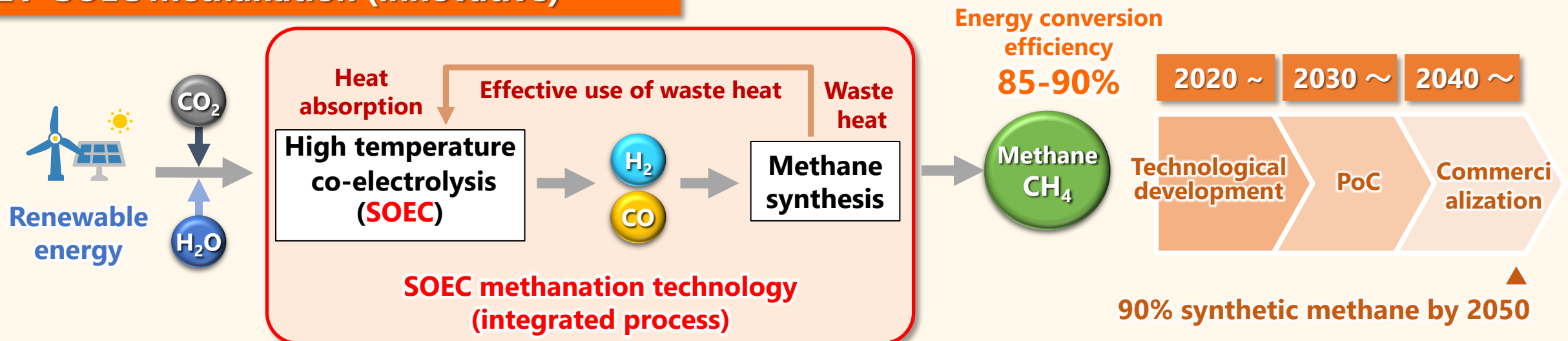
Incentives for production, procurement and utilization

Methanation Technology and Its Practical Application

1. Sabatier methanation (conventional)

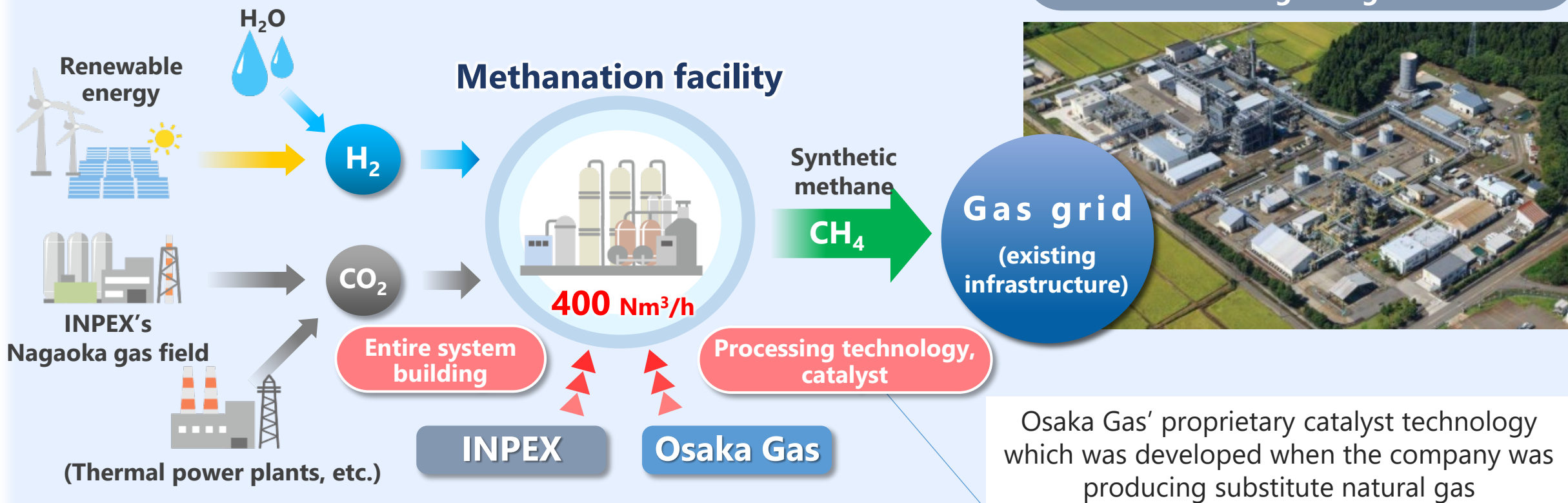


2. SOEC methanation (innovative)



Sabatier Methanation

Production and injection of synthetic methane into the gas grid



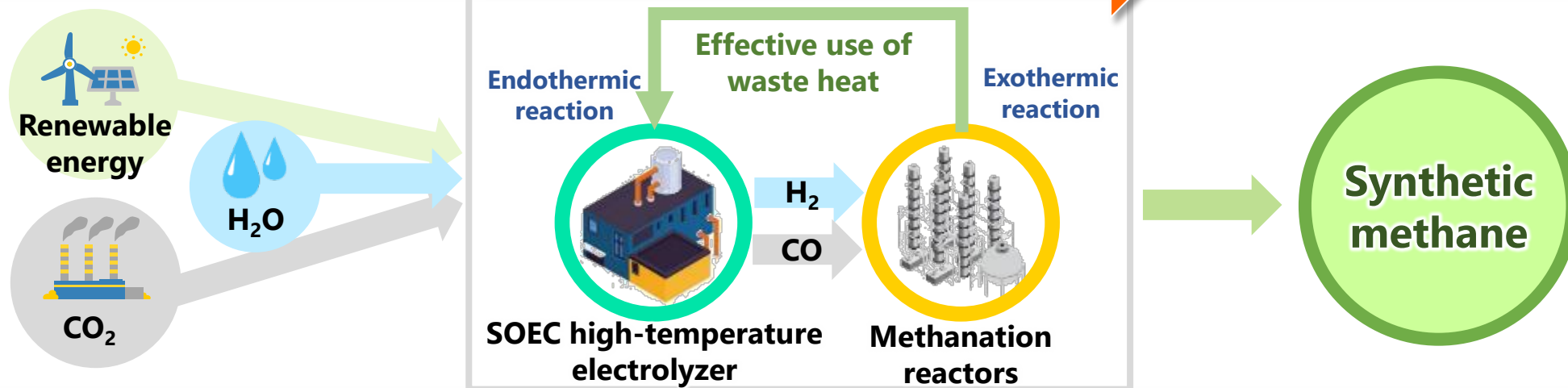
Study on scaling up the capacity for PoC and commercialization

Aiming to **inject 1% synthetic methane** into the gas grid while conducting the **PoC scale (10,000Nm³/h)** and **commercial scale (60,000Nm³/h)** reactor simulation, creating their basic designs, and implementing feasibility study.

SOEC Methanation

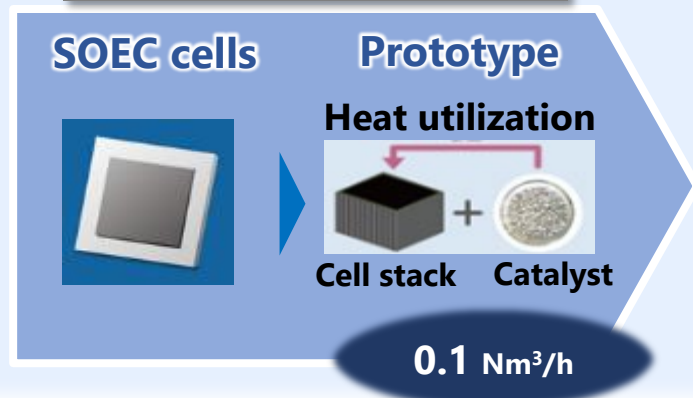
SOEC methanation

Total energy efficiency of 85-90%

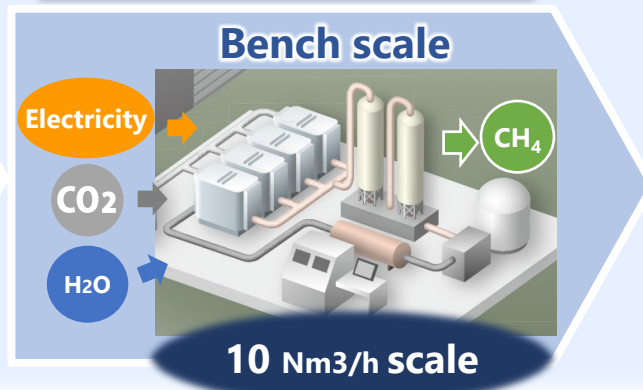


Development schedule

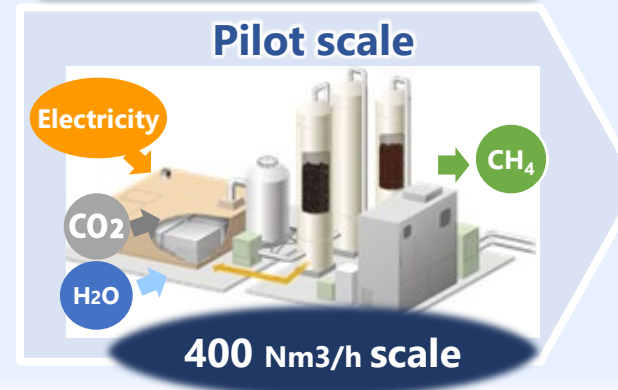
2022-2024



2025-2027



2028-2030



Proof of Concept

Thank you
