May 10, 2022
ENEOS Holdings, Inc.
Electric Power Development Co., Ltd. (J-POWER)

ENEOS and J-POWER collaborate on carbon neutralization of energy supply

ENEOS Holdings, Inc. (President: Saito Takeshi, “ENEOS”) and Electric Power Development Co., Ltd. (President: Watanabe Toshifumi, “J-POWER”), announced a collaboration to jointly pave the way for carbon neutralizing the energy supply. The collaboration includes a feasibility study of domestic carbon capture and storage (CCS)* using both companies’ technologies and expertise.

The two companies will jointly study the feasibility of largescale domestic CO_2 CCS systems to reduce CO_2 emissions from using fossil fuels. The companies will implement the first largescale CCS project in Japan, looking toward 2030 in collaboration with other partners who are working on carbon neutrality. The companies will contribute to achieving Japan’s reduction target for greenhouse gas (GHG) emissions, while providing a stable supply of energy.

ENEOS has envisioned goals for 2040 in the Long-Term Vision, including contributing to the development of a low-carbon, recycling-oriented society. The specific ways that ENEOS will achieve carbon neutral status in its own CO_2 emissions by 2040 include pursuing renewable energy, CO_2-free hydrogen, CCS/CCUS, and EV and other aspects of mobility business. ENEOS, using the CCS expertise already within the Group, will take the initiative for implementing CCS in Japan, with the goal of maintaining the domestic business foundation, which is essential for a stable supply of energy.

In February, 2021, J-POWER announced BLUE MISSION 2050, a plan for J-POWER to further accelerate the amount of CO_2-free power sources—generating CO_2-free hydrogen power to supplement output adjustment and supply capacity. At the same time, J-POWER will look to achieve a carbon neutral power supply by 2050. CCS is an essential approach for generating CO_2-free hydrogen power and a further step toward realizing BLUE MISSION 2050.

Aside from the projects highlighted above, ENEOS and J-POWER will study new collaborative opportunities in the fields of renewable energy and CO_2-free hydrogen.

Combining J-POWER’s CO_2 capture technology from Biomass gas with ENEOS's CO_2 underground storage technology leveraging domestic oil and gas fields, we aim to implement CCUS and demonstrate CO_2-free hydrogen production by the late 2020s.

[Attachments]

1. Beginning Feasibility Study for Large-scale CCS in Japan
2. Beginning Investigation for Demonstration of CO_2 Negative Hydrogen Production from Biomass Gas

Attachment 1

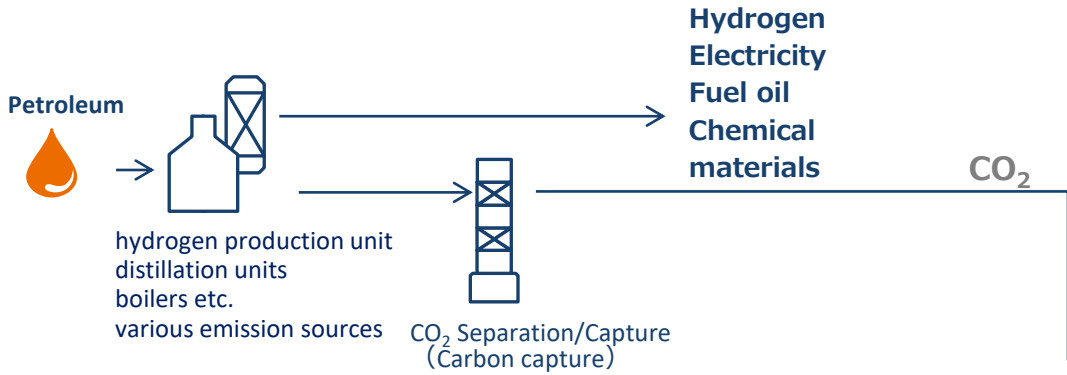
Beginning Feasibility Study for Large-scale CCS in Japan

As major CO_2 emitters, we will take the lead in CCS and contribute to a stable supply of energy and carbon neutrality. We will take on the challenge of beginning largescale CCS in 2030 by joining forces with businesses that emit CO_2 and by collaborating and coordinating with construction, equipment, and transportation companies.

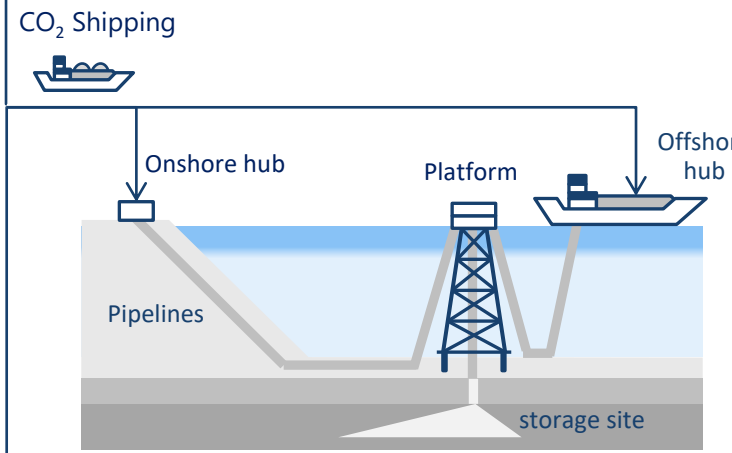
Concept

- Separation and capture of CO_2 emitted during the oil refining process, contributing to refinery decarbonization
  - Separation and capture of highly concentrated CO_2 from hydrogen production unit
  - Separation and capture of CO_2 from flue gases at distillation units and boilers

ENEOS

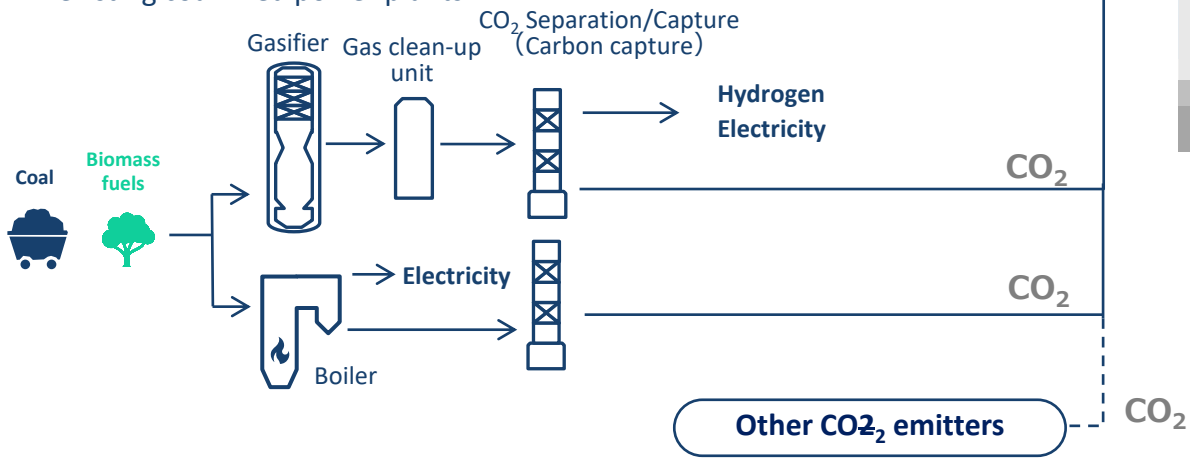


- CO_2 is transported to the reservoir (storage site) for injection and storage
  - Study of candidate areas with CO_2 storage potential
  - Study of transportation methods from the emission sources to the storage site
  - Considering press-in (injection) system (platform) for the storage site



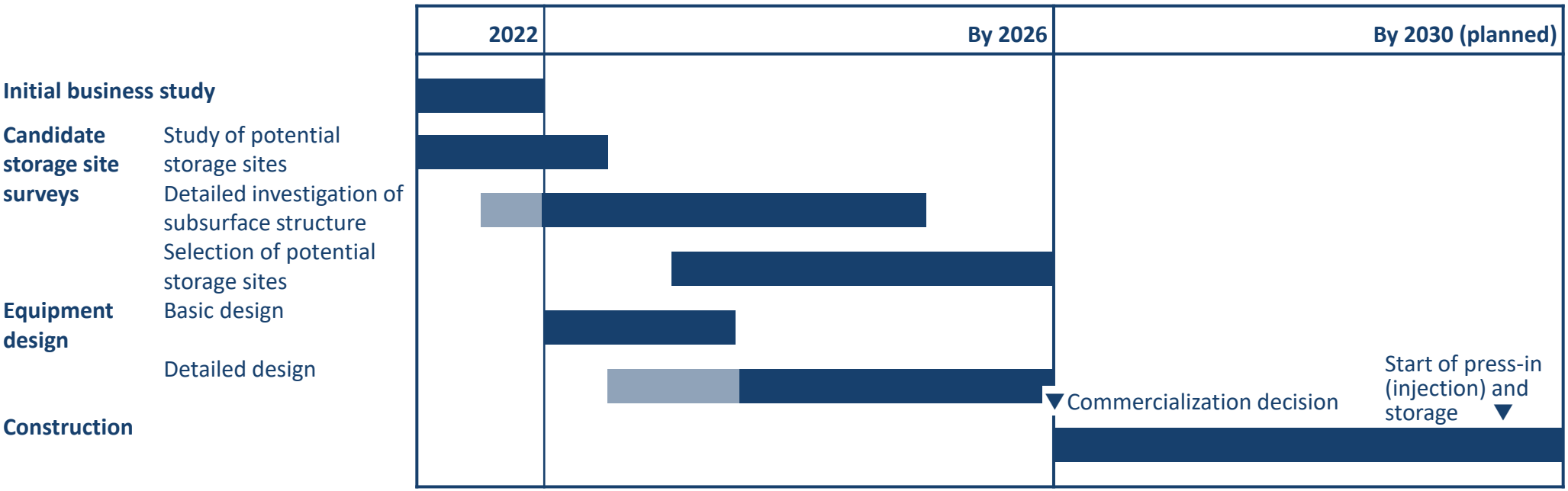
- Separation and capture of CO_2 emitted from coal-fired power plants
  - CO_2 -free hydrogen power generation by combining technologies for gasification with CO_2 separation and capture technology
  - Also anticipated is the separation and capture from gas after combustion in existing coal-fired power plants

J-POWER

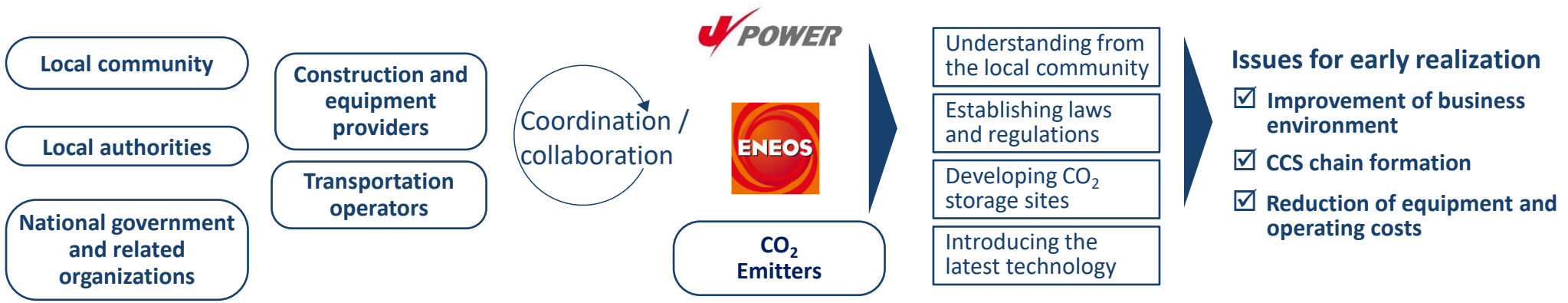


Roadmap

- A feasibility study will be done in western Japan, the location of both companies' emission sources and where CO_2 sequestration potential is anticipated.
- It will take nearly 10 years—from the investigation of candidate storage sites to the start of press-in (injection) and storage—for surveys, design, and construction.
- By starting as early as possible, we will contribute to CO_2 reduction in Japan from 2030



- To achieve an early resolution of our goals, we will coordinate and collaborate with all stakeholders to resolve issues, such as business environment improvement, CCS chain formation, and reducing costs

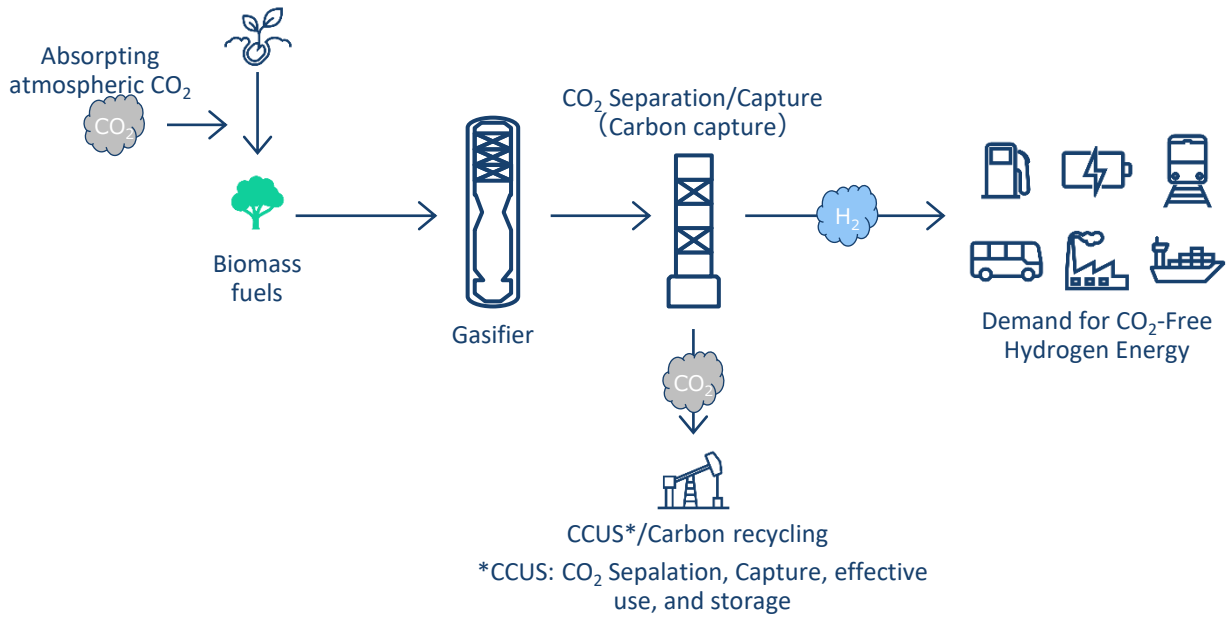


Attachment 2

Beginning the Study for an Integrated Demonstration of CO_2-Negative Hydrogen Production from Biomass

CO_2-free hydrogen will be produced by splitting biomass into hydrogen and CO_2 using gasification technology and then separating out and capturing the CO_2.
Separated and captured CO_2 will be pressed-in (injected) and stored underground using existing oil and gas fields to achieve negative emissions.

Concept



Roadmap

- We will begin a feasibility study this fiscal year to develop biomass gasification technology using scrap wood and other biomass produced locally for local consumption.
- In the late 2020s, we intend to start a demonstration project combining CCUS with the production of hydrogen from biomass using gasification technology.

FY2022 Feasibility study, design, and construction		**By the late 2020s** CO_2-free hydrogen production demonstration
Considering obtaining biomass (scrap wood, etc.)	→	Demonstration of the local production for local consumption model including hydrogen use
Investigating biomass gasification technology	→	Establishing CO_2-free hydrogen production technology
Considering CCUS at existing oil and gas fields	→	CCUS demonstration for early implementation