Toward a Carbon-Neutral Society

May 13, 2021

Japan Petroleum Exploration Co., Ltd.

Background of "JAPEX 2050" Formulation

Reorganized our responsibility and role for the Carbon-Neutral Society

JAPEX's efforts under the mission of "stable energy supply"

Oil and gas E&P*, and natural gas supply as lower environmental impact fuel for many years

* Exploration and Production

Founded in 1955

Exploration and production in domestic oil & gas fields/
Participation in overseas E&P projects
Construction and operation of domestic natural gas supply network

Long-term vision in May 2018

Commenced a natural gas power plant/
Established organization for renewable energy,
New Business, and Environmental Business

Growth as a **"Comprehensive Energy Company"**
by electricity and business with lower environmental impact

October 2020 Target Setting by the Government

Aims to achieve net-zero GHG emission by 2050

"JAPEX2050 ~ for the Realization of a Carbon-Neutral Society ~"
formulated in May 2021

- Reorganized efforts to date, **clarified our responsibility and focus area toward the carbon-neutral society**
- Pursue new possibilities as a **"Comprehensive Energy Company" that contributes to realize net-zero in 2050**

Outline of “JAPEX 2050”

Specified JAPEX’s target and focused contribution areas toward 2050

GHG Emission Reduction Target

Scope1+2

- **Reduce by 40%** in FY2030 compared to FY2019 of CO_2 emission intensity of the JAPEX group’s operations
- Achieve the **net-zero CO_2 emission of our group’s operation in 2050**

Scope3

- **Contribute to establish new technologies and energy supply with low environmental impact**, for achieving the net-zero CO_2 emission in our supply chain

Contribution Areas for Net-zero

CCS/CCUS

- Realize and commercialize **CCS/CCUS technologies**
- Enter the business areas related to CCS/CCUS, such as blue hydrogen, methanation, and natural gas-fired power plants with CCS

Renewable Energy

- BECCS (Biomass power generation with CCS/CCUS that enables negative emissions)
- Offshore wind power generation to leverage our E&P experience and expertise

Stable Supply of Oil and Natural Gas

Natural Gas Use Promotion

- Respond to the demand for fuel switching from other fossil fuel such as coal and heavy oil
- Strengthen our responses for meeting various future demands to LNG

Interest Acquisition and Development

- Recognize that oil and natural gas will remain as one of the major energy sources
- Focus on the acquisition of oil and gas interests, as well as its development and production continuously

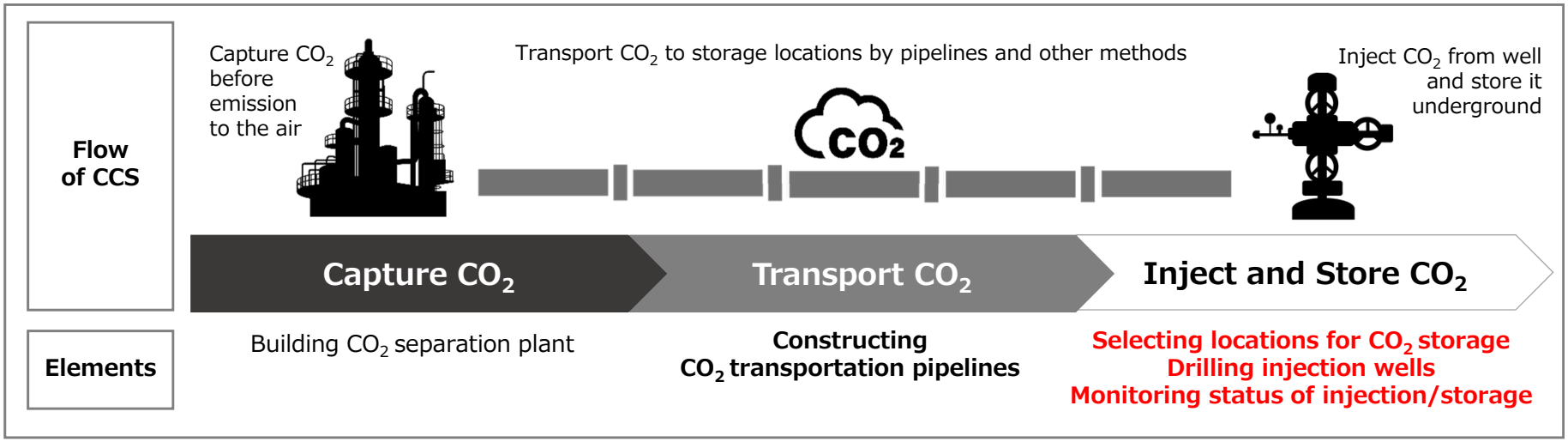
About CCS/CCUS

JAPEX 2050

Reducing CO_2 emission by capture, injection, and storage underground

CCS: Carbon dioxide Capture and Storage
CCUS: Carbon dioxide apture, Utilization, and Storage

- **Proceeding examination and verification for implementation worldwide to achieve “net-zero” by 2050**
- **In Japan, undertaking verifications including a large-scale governmental one at Tomakomai, Hokkaido**
  - ✓ JAPEX has been participating in the **Tomakomai CCS verification test** as **the top shareholder of Japan CCS Ltd.**



CCS/CCUS has high affinities with E&P which are JAPEX’s significant strengths

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Our Capabilities and Possibilities in CCS/CCUS

JAPEX 2050

Aiming the early realization of CCS/CCUS as a pioneer in Japan

Subsurface investigation (Geophysical Exploration)

Well drilling from land to subseafloor

Well management/monitoring

Select candidate locations for CCS/CCUS, and execute CO_2 injection, storage, and monitoring

- ✓ **Technical capabilities to complete all elements in the JAPEX group** for realization including exploration, drilling, and monitoring
- ✓ Utilize the data concerning deep saline aquifers*, acquired by our investigations and explorations in Japan

Capture CO_2 → **Transport CO_2** → **Utilize CO_2** → **Inject and Store CO_2**

Transport separated and captured CO_2

- ✓ Establish CO_2 transportation infrastructures leveraging **our expertize in natural gas and LNG supply**

Such as high-pressure gas pipeline and coastal vessels

Collaborate and Enter Carbon-Neutral Business

- ✓ **Apply CCS/CCUS to power generation** by gas and biomass
- ✓ Consider to enter **blue hydrogen and methanation** business

Focus on gas-fired and biomass plant, including facility owned by other companies

[Blue Hydrogen] Discompose natural gas, and capture CO_2 after production

[Methanation] Produce Methane (CH_4) from H_2 and CO_2

Note) * Sandstone layer in deep underground that includes ancient sea water (salt water) which are not suitable for drinking. Its geographical distributions are broader compared to oil and natural gas reservoirs, and CO_2 storage capacity is anticipated.

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Lower Environmental Impact Energies

JAPEX 2050

Strengthen our response to increasing demands for specific energies

Participation in Renewable Energy Projects

Increase and examine candidates mainly biomass and offshore wind power while utilizing our conventional capabilities

Biomass Power Generation

✓ Utilize **expertise in natural gas power project**
- Process management of plant construction
- Procurement of fuel LNG, and others

Offshore Wind Power

✓ Utilize **expertise in oil and natural gas E&P**
- Offshore platform operation and management
- Subsurface examination of installation location

\+ **CCUS/CCS Collaboration**

➢ Consider to apply **BECCS*** in biomass power generation plants
* Bioenergy with Carbon Capture and Storage

Respond to Demands for Natural Gas with Lower Environmental Impact

Expand gas utilization as well as conduct natural gas E&P and LNG procurement, with assumption of its long-term gas demands

Respond to Increasing Natural Gas Demand

✓ **Demand for switching** from coal and heavy oil
- Such as power plants and large scale facilities
- Horizontal expanding various supply methods including overseas

Stable Natural Gas Production and Supply

✓ Acquire new overseas interests/ new and additional development in Japan
✓ Flexible and competitive LNG marketing
- Consider carbon-free LNG procurement

\+ **CCS/CCUS Collaboration**

➢ Consider to apply **CCS/CCUS to natural gas power plant**
➢ Challenge to enter blue hydrogen and methanation business areas

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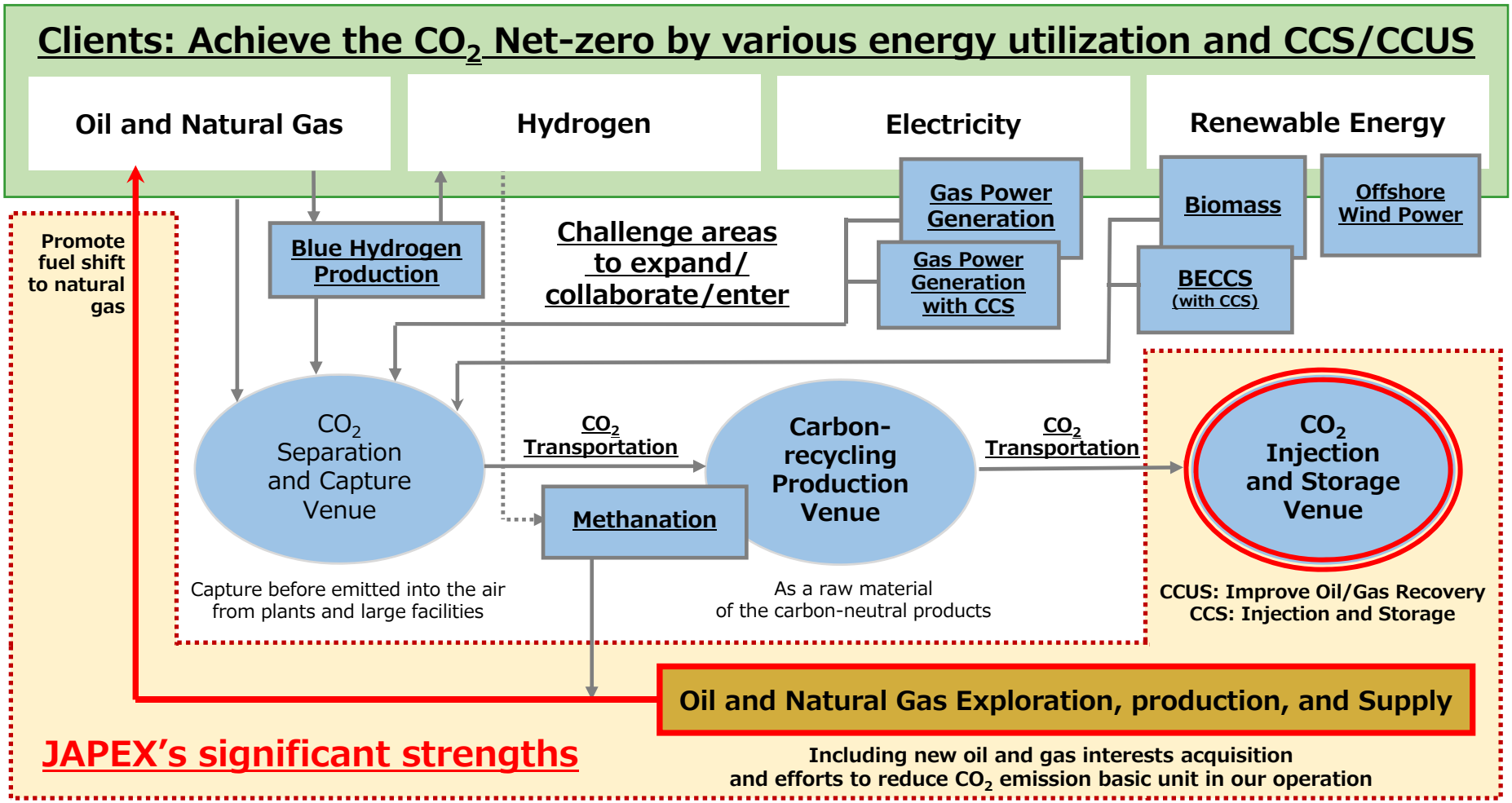
Business Assumptions toward 2050

JAPEX 2050

CCS/CCUS centered business cycle toward the carbon-neutral society



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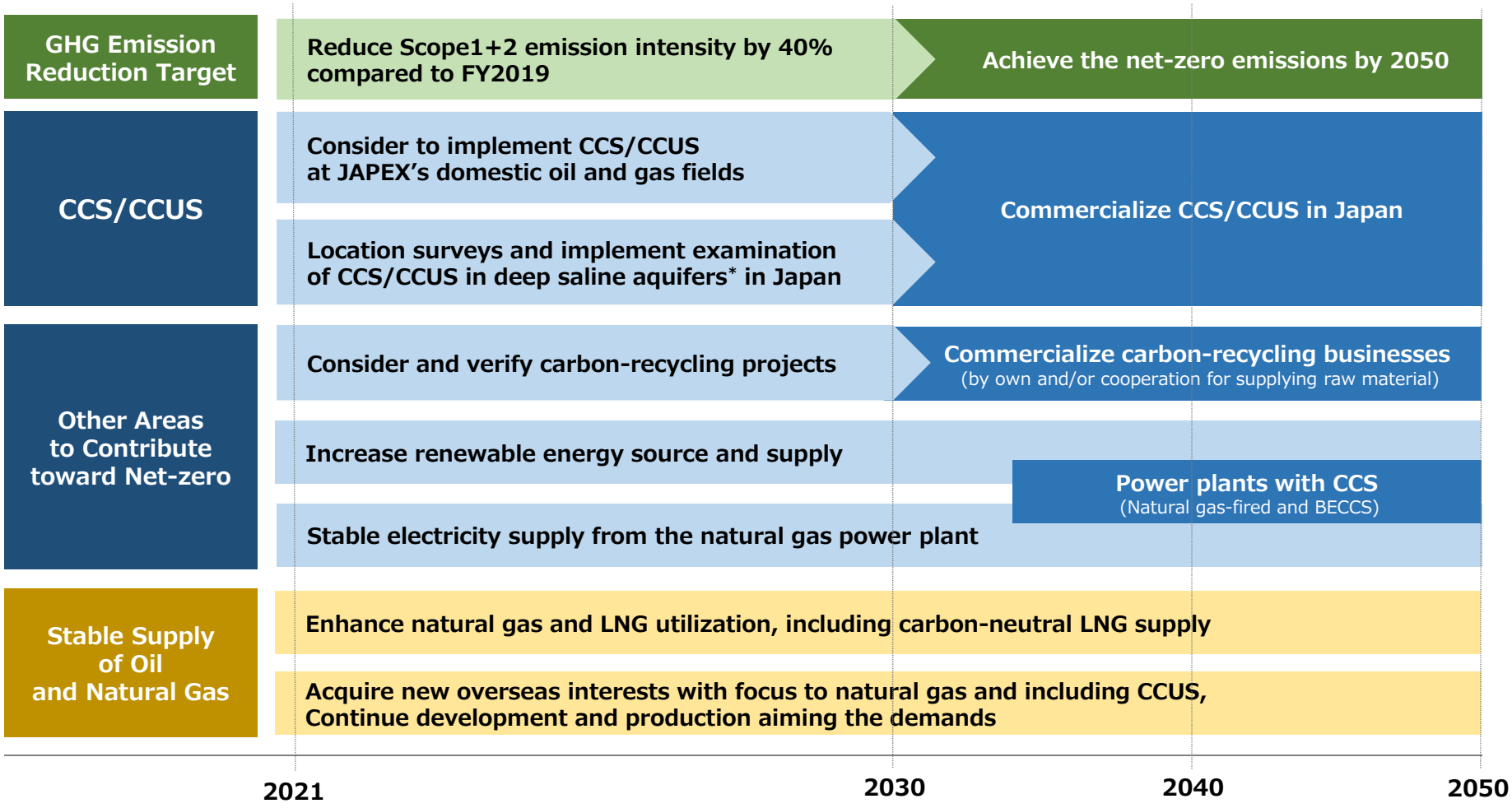
Roadmap toward 2050

Reduce Scope1+2 emission intensity and implement CCS/CCUS in 2030



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