

JOGMEC-TRC's New Technical Business Strategy for a Carbon Neutral Society

July 26, 2023

JOGMEC-TRC

1. Introduction

In the dramatically changing environment surrounding oil and natural gas development, there are high expectations for JOGMEC to be even more proactive in technical business support. These same expectations extend to the Technology & Research Center (TRC), which handles the technical and technological support function for JOGMEC.

JOGMEC-TRC formulated the “Technical Business Strategy for a Low-Carbon Society”¹ in July 2020 and established a new “CCS (Carbon Capture and Storage) Group” (renamed to “Hydrogen and CCS Project Department” in November 2022) within JOGMEC to strengthen support for oil and gas development with low environmental impact using CCS technology.

On the other hand, after its formulation, JOGMEC has revised the technical business strategy in light of changes in the surrounding environment, including “social demands to realize carbon neutrality by 2050” and “recent rapid instability of energy supply,” as well as the “The 6th Strategic Energy Plan” by the Government of Japan and “the new functions added to JOGMEC due to the revised JOGMEC Act.”

The following points have been significantly modified regarding this new technical business strategy.

- Because new business fields have been added to JOGMEC by the revised JOGMEC Act (Storage into the saline aquifer of carbon dioxide (CO₂) which is emitted from industrial processes and production business of hydrogen and ammonia), it is necessary to acquire knowledge on them, and we will address them as “Pillar 2” and “Pillar 3” (See the diagram below).
- We will continue to work on a steady execution and enhancement of “stable energy supply” and “core technologies (especially human resources)” even in a turbulent surrounding environment.

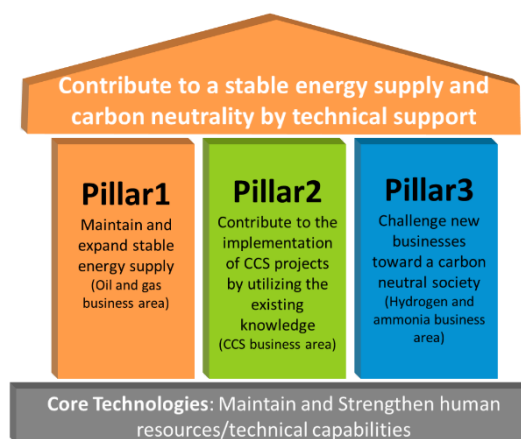
Based on this new technical business strategy, JOGMEC-TRC will continue to achieve a stable energy supply and carbon neutrality.

2. Three pillars and core technologies on the new technical business strategy

¹ JOGMEC News Release: Technical Business Strategy for a Low-Carbon Society and Establishment of the CCS Group

October 14, 2020: https://www.jogmec.go.jp/english/news/release/news_15_000001_00015.html

The new technical business strategy was established to achieve a stable energy supply and carbon neutrality through our technological contribution by reviewing the previous technical business strategy. Accordingly, we have defined new “three pillars and core technologies” on the JOGMEC-TRC's technological development and technical support.



Pillar 1: Maintain and expand stable energy supply (Oil and gas business area)

The energy supply is rapidly becoming unstable due to the global situation. Under this circumstance, JOGMEC-TRC will support the efforts of Japanese companies and strengthen technical efforts to contribute to the Japanese government target of above 50% of Japan's independent development ratio of oil and natural gas by 2030 and further expansion above 100 million tons per year of LNG (Liquefied Natural Gas) handling volume. Furthermore, in light of social demands for the use of fossil fuels, we will promote technological development and support for the conversion to low-carbon fuel (natural gas) assets that lead to the reduction of GHG (Greenhouse Gas) emissions and environmental impact by oil and gas development.

Specifically, we will focus on technological development and technical support that contribute to (1) reducing environmental impact and maximizing the value of existing core assets of Japanese companies to participate and (2) acquiring natural gas resources (through new exploration and additional development), to diversify supply areas and contribute to a shift from crude oil to natural gas.

Priority action

To maintain a stable supply of fossil fuels by maintaining and increasing production of existing oil and gas development fields while responding to social demands for the development of fossil fuels, we will promote initiatives such as “EOR technology,” “implementation of digital technology,” and “low environmental impact technologies” that will contribute to reducing environmental impact and maximizing the value of assets of existing oil and gas development fields in which Japanese E&P companies operate and participate.

A shift of energy resources from crude oil to natural gas, which has lower carbon intensity* than oil, can promote the diversification of energy resources and the reduction of the current GHG emissions by fossil fuel development. Therefore, we will promote

initiatives such as “evaluation technology for gas reservoir” and “support for unconventional gas resource development” that contribute to gas exploration and additional gas development.

*Carbon Intensity: The amount of CO₂ and other greenhouse gases emitted per unit of energy consumed or produced

Pillar 2: Contribute to the implementation of CCS projects by utilizing the existing knowledge (CCS business area)

Because we have strengths in the technical expertise in the surface facility and subsurface evaluation, including CO₂-EOR technology and the relationships with oil and gas-producing countries (NOCs), we can also utilize these strengths in the CCS business fields. Accordingly, we will acquire “Priority action” expertise through domestic and overseas demonstration tests and studies.

Furthermore, through utilizing the expertise which we will acquire and accumulate, we aim to be an organization that is constantly relied upon and recognized by society in the field of CCS by (1) support for the commercialization of CCS (Support for FS/Pre-FEED, Support for Public Acceptance, and technical evaluation for equity investments) and (2) support for CCS-suitable site surveys.

Priority action

By demonstrating domestic and overseas projects, we will acquire and accumulate expertise in the following priority technologies and utilize the acquired and accumulated knowledge for other technical support and technological assessment for equity investment.

- Subsurface evaluation of CCS (Reservoir evaluation and management + CO₂-EOR)
- CO₂ storage monitoring
- Evaluation of formation integrity (geomechanics) and well integrity
- CO₂ separation technology at high-pressure conditions
- Development of evaluation methods and standards (guidelines) necessary for the implementation of CCS projects

Pillar 3 : Challenge new businesses toward a carbon neutral society (hydrogen and ammonia business area)

The hydrogen and ammonia production business, including blue hydrogen and ammonia, is expected to become one of JOGMEC’s core businesses. We will aim to acquire human resources and technical expertise for supporting hydrogen and ammonia production business as soon as possible by collaborating with the department in charge of equity investment and utilizing external human resources.

Moreover, to realize a carbon neutral society by 2050, it is necessary to diversify energy sources that do not emit GHG and actively achieve “Carbon negative” in the medium to long term. Therefore, we will explore opportunities to contribute to medium to long-term new clean and renewable energy projects (offshore wind power projects, technologies for negative emission, etc.).

Priority action

Through the collaboration with the department in charge of equity investment and the support for the commercialization of blue hydrogen/ammonia and green hydrogen/ammonia, we will quickly acquire technical knowledge, especially in the fields of facilities and power generation, necessary for evaluation as our most important missions.

Core technologies: Maintain and strengthen “human resources/technical capabilities” as the foundation for carrying out Pillar 1 to Pillar 3

Global technological competition in energy resource development is becoming increasingly intense, as exemplified by implementation of advanced cutting-edge technologies such as AI. We aim to continue to be one of the leading organizations in Japan of “human resources/technical capabilities” in energy resource development.

Priority action

We will maintain and strengthen “technical capabilities” for technical support and evaluation of equity investments and “human resources” that can advance the Japanese energy resource development industry.

- Investigate trends in cutting-edge technologies and share them with Japanese companies
- Develop internal human resources, who have digital technology and other new expertise, and provide training to Japanese companies
- Maintain experimental and research systems as a base for technology development and technical support
- Timely and intelligibly disseminate obtained findings and results
- Strengthen collaboration with other JOGMEC’s business units, starting with geothermal, in technology, human resource development, and in information gathering and dissemination

3. To maximize JOGMEC-TRC’s outcome of technology development and technical support

To maximize our outcome with a limited budget and human resources, we will promote technology development and technical support while structuring new projects and managing the progress of projects based on the following five evaluation criteria.

- ① Technical superiority for “securing stable energy supply*” or “realizing carbon neutrality” in Japan in the future.

*Through the following contributions:

<Direct Contribution> Maintenance and acquisition of oil and gas interests, increase in recoverable reserves

<Indirect Contribution> Relations with the natural environment and stakeholders, cost reduction, safe operations

- ② Enough demand from Japanese companies or oil and gas-producing countries and transferability (from an objective viewpoint) to other regions or fields.
- ③ Consistency with the global leading-edge technologies and changes in the surrounding environment.
- ④ Suitable task for JOGMEC rather than other companies and appropriate division of roles with partners.
- ⑤ Feasibility of being done or carried out regarding personnel and resources.

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