

# JOGMEC-TRC's Technical Business Strategy for a Low-Carbon Society

July 1, 2020  
JOGMEC

## 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 the area of technical business support. These same expectations extend to the Technology & Research Center (TRC), which handles the technical and technological support function for JOGMEC.

Above all, oil and natural gas development must consider climate change issues, as is clearly stated in the nationally enacted “New International Resource Strategy” (announced by the Ministry of Economy, Trade and Industry on March 30, 2020).

Based on these issues, JOGMEC-TRC recently reviewed the directionality of future technical and technological development, and established a new technical business strategy. This strategy will be formulated over a period of three to five years, and will be reviewed annually in response to changes in international trends, the needs of oil and gas companies, revision of Japan’s energy policies, and other environment issues.

## 2. Technical Business Strategy

As part of our mission to provide a stable supply of hydrocarbon resources for Japan, JOGMEC-TRC has endeavored to play the role of:

- an analytical center that meets the technical needs of oil and gas development companies; and
- an R&D base for technology development in a wide range of technical fields such as exploration, development, and production.

Meanwhile, with the greater prominence of global warming and various social issues arising from the development and consumption of hydrocarbon resources, it is increasingly necessary for JOGMEC-TRC to reduce the environmental impact on the next generation while fulfilling its mission.

Through the following steps, JOGMEC-TRC aims to become a hub for technology, information, and human resources pertaining to oil and gas development in a low-carbon society:

- ① **Contribute to a low-carbon society:** Strengthen technology development efforts for environmentally friendly oil and gas development. Specific themes include carbon dioxide capture and storage (CCS) and CCUS, as well as the creation of new resources such as hydrogen and ammonia from hydrocarbons;
- ② **Pursue new possibilities in oil and gas field development:** Promote the utilization of digital technology and the practical application of unconventional resource development technology ;
- ③ **Strengthen foundational technologies for technical evaluation of exploration and development projects:** Strengthen JOGMEC’s project evaluation expertise, from both scientific/engineering and business perspectives. Enhance JOGMEC’s ability to provide technical support to oil and gas companies in Japan.

### ① **Contribute to a low-carbon society**

Utilizing the knowledge and technical capabilities that come from our long experience in oil and gas development, we will promote the following efforts to establish new business models.

Supporting the integration of CCS with resource development projects JOGMEC-TRC will utilize CCS technologies such as CO<sub>2</sub>-EOR, which the organization has long

been working on, to support oil and gas development with low environmental impact. To this end, we have established a new “CCS Group” under the Oil & Gas Upstream Technology Unit to facilitate and support projects which integrate CCS with resource development, as well as to promote related technology development. The CCS Group will support projects such as the development of CO<sub>2</sub>-rich oil and gas fields integrated with CCS, and promote cooperation with worldwide research institutions, including joint technology development and verification.

**(Ideal Direction)** In addition to strengthening technological knowledge and technical evaluation capabilities for the support of projects which integrate CCS and resource development, we will develop and demonstrate competitive and cost effective CCS technologies, including geological and reservoir analysis, and apply them to specific fields. We aim to be recognized as one of the leading organizations in the facilitation of CCS for resource development.

R&D of low environmental impact technologies In order to develop oil and gas fields with low environmental impact, we will promote on-site demonstrations of existing JOGMEC-TRC technologies, such as CO<sub>2</sub> separation membranes, and promote R&D of new environmental impact reduction technologies in cooperation with related companies (manufacturers, engineering companies, etc.).

**(Ideal Direction)** By introducing and developing cutting-edge technologies in processes such as CO<sub>2</sub> separation, capture, and storage, we will realize our grand design for the integrated development of oil and gas fields with low environmental impact. This system will be established by public and private sectors working together as one.

Building future value chains by creating new resources from hydrocarbons We will promote the implementation of feasibility studies and technical studies to establish a business model for the development of low-carbon energy sources such as hydrogen and ammonia.

**(Ideal Direction)** We aim to become the core organization of a low-carbon value chain that adds new value to conventional oil and gas development, while applying CCS technology to offset CO<sub>2</sub> associated with the production of ammonia and other such substances produced from hydrocarbons.

## ② Pursue new possibilities in oil and gas field development

Taking into account low oil prices, the importance of low carbon emissions, and other changes in the external environment, we will make the following efforts to provide technical support, improve productivity, and increase reserves in oil and gas field development.

Pursue opportunities in digital technology and create new business areas We will support the improvement of operational efficiency and productivity at oil and gas field development sites by promoting digital technology PoC (Proof of Concepts), internal and external human resource development, and the utilization of data. PoC's will be performed in cooperation with AI/IoT companies. We will establish a function as a digital knowledge center with integrating knowledge, capability, and human resources. We will propose the ideal form of oil and gas field development based on new ideas and viewpoints in accordance with the directionality of the digital transformation that is referred to as the JOGMEC Digital E&P Platform<sup>1</sup>.

**(Ideal Direction)** JOGMEC-TRC will become an information hub linking oil and gas development companies in Japan with other organizations worldwide. Our aim is to strengthen international competitiveness by promoting the implementation of technologies in each company's business area.

Tight oil and gas development The results of our research in the area of shale gas and

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<sup>1</sup> JOGMEC News Release related to Digital E&P Platform (March 15, 2019)  
[http://www.jogmec.go.jp/news/release/news\\_03\\_000018.html](http://www.jogmec.go.jp/news/release/news_03_000018.html) [Japanese]

oil development are widely adopted in the fields in which Japanese E&P companies operate and participate. Specifically, we carry out R&D on subjects such as IOR/EOR, well completion, and hydraulic fracturing design. In order to achieve asset value improvement for Japanese E&P companies, our R&D results reduce the uncertainty associated with shale development, reduce drilling costs, and improve well productivity.

**(Ideal Direction)** JOGMEC-TRC supports efforts by Japanese oil and gas companies to gain high expertise as major players in tight oil and gas development and their business development thereof.

Commercialization of methane hydrate We will promote Japan's methane hydrate development plan, which has graduated to a new phase of R&D in which we are conducting long-term onshore production tests in Alaska (in joint research with the US) and identifying promising areas of resource concentration in the seas around Japan. We will also contribute to the realization of the commercial use of methane hydrates produced from beneath the seas around Japan.

**(Ideal Direction)** As a global leader in the field of methane hydrate, Japan will continue to promote R&D, with the aim of establishing a technological foundation to support the commercialization of methane hydrate, which is expected to serve as a domestic resource.

### ③ **Strengthen the foundational technologies for technical evaluation of exploration and development projects**

As an organization that integrates human resources and knowledge in specialized fields throughout oil & gas exploration and development, and as a national organization that provides technological support and technical evaluation on oil & gas projects, JOGMEC-TRC will make the following efforts in order to fulfill these roles more than ever before.

R&D and applied technological support thereof Through R&D focused on solving the challenges faced by Japanese oil and gas development companies, we will accumulate and utilize new knowledge. To this end, we will strengthen efforts to understand the needs of oil and gas development companies and to further utilize the knowledge of intellectuals outside the organization for future application.

Challenge beyond oil & gas We will expand the scope of our R&D beyond oil and gas field development, and engage in new research issues arising from geothermal, metal, and other adjacent fields.

### 3. Flagship R&D projects and other important actions

The core R&D projects that JOGMEC-TRC should promote independently and proactively in the future will be positioned as 'flagship projects' and strongly promoted. Examples of strong candidates for flagship projects would be those which integrate CCS and resource development, and those related to tight oil and gas development. In the future, these projects will be reviewed in accordance with changes in the surrounding environment and the needs of oil and gas development companies. In order to provide value-added solutions for Japanese oil and gas development companies JOGMEC-TRC aims to accumulate knowledge and experience in technical areas that will be important for the realization of a low-carbon society in the future.

These efforts will be carried out through cooperation and collaboration between JOGMEC-TRC and outside organizations. In order to further enhance these functions, TRC will enhance its transparency as a public organization by promoting information disclosure online and through the use of various media such as TRC Week and annual reports. We will also utilize our management resources to actively promote the implementation of human resource development programs for the improvement of technical capabilities,

pursue the expansion of joint research using our research facilities, and proactively introduce new workflows to enhance the efficiency and potential of the business. We will also break free of stereotypes, and will create a better environment that allows researchers and engineers to dedicate themselves to their work.

We will keep working to make social contributions in the field of energy resources, in which the results of JOGMEC-TRC's activities and businesses will be communicated in an easily comprehensible way, the people of Japan and other worldwide oil and gas development stakeholders will clearly understand the status of our activities, and see that JOGMEC-TRC is a research organization that attracts excellent researchers and engineers.

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