

I Introduction

"Research Consortium for Methane Hydrate Resources in Japan" (also known as MH21) is an industry-government-academia collaboration research group. Established in FY2001 by Japan Oil, Gas and Metals National Corporation (JOGMEC) and the National Institute of Advanced Industrial Science and Technology (AIST), its purpose was to undertake research into the future of commercial development of methane hydrates in Japanese waters for use as a domestic fuel energy resource in accordance with "Japan's Methane Hydrate R&D Program", a program that was announced in July 2001 with funding from the Japanese Ministry of Economy, Trade and Industry. It carried out the R&D activities of both phases 2 (Japanese fiscal year* (FY) 2009-2015) and 3 (FY 2016-FY2018).

During the study term, events such as the 2011 Tohoku Earthquake and the subsequent temporal termination of nuclear power plant operations, the sudden rise and fall of oil and gas prices, the shale gas revolution, advancement of measures to provide against global warming and the introduction of renewable energies, as well as other factors have jolted the Japanese socio-economic structure in terms of energy. However, little has changed in the fundamentals. Japan is still heavily dependent on imports of primary energy.

From the start of the project, the primary objective has been expressed in the following terms: "Methane hydrate, of which substantial amounts are expected to reside offshore Japan, is positioned to be a future energy resource, thus impelling advances in technological developments such as the drilling, production and recovery of methane hydrate on an economical basis in order to enable future utilization that will contribute to the acquisition of a long-term, and stable supply of energy."

In order to assist in the achievement of this objective, R&D work on the technologies required for field development, resource estimation, production, and environmental assessments have been carried out on an ongoing basis. Consequent to this, many new findings have been acquired and knowledge obtained. Significant achievements have been the successful implementation of the 1st and 2nd offshore production tests as per the initial objective. However, there are a remaining number of both technical and non-technical issues to be overcome. For this reason, further R&D work still needs to be carried out.

During Phase 2 and 3, three groups have been leading the research program and have carried out offshore gas production tests on two separate occasions. These have been the Group of Administrative Coordination, Research Group for Field Development Technology, Research Group for Production Method and Modeling, and Research Group for Resources Assessment.

This comprehensive report details the processes and achievements of the program together with remaining

issues that are needed to promote public understanding of methane hydrate extraction and suggests directions for further studies.

* Japanese fiscal year (FY) begins on April 1st of the stated year and ends on March 31st of the following year.

References

Japan's Methane Hydrate R&D Program Phase 1 Comprehensive Report of Research Results

http://www.mh21japan.gr.jp/mh21wp/wp-content/uploads/phase1_200808_english.pdf

Implementation plan for phase 2

<http://www.mh21japan.gr.jp/english/wp/wp-content/uploads/c78678339b1ca272c59cb2b006dd244a1.pdf>