

Preliminary Survey on Hydrogen Liquefaction in Qatar

During fiscal 2012, JCCP and Qatar Petroleum (QP) implemented a preliminary survey on liquefied hydrogen production in Ras Laffan, Qatar.

1. Background

Qatar is home to the North Field Gas Reserves, which has the world's largest reserve of natural gas, and is an important energy supplier to Japan. As a worldwide increase in demand for natural gas is expected in the future, the reserves are garnering stronger attention than ever before. To secure a stable energy supply, Japan should also maintain a close relationship with Qatar.

Meanwhile, natural gas is considered the ultimate clean energy source, and efforts are being made in Japan and around the world to use natural gas to produce hydrogen. Many refineries have already begun to use hydrogen in large amounts for desulfurization and other such processes, but in the future, demand for hydrogen is also expected to increase for use in power generation and as automotive fuel. Although hydrogen can be produced from various energy sources, using reformed natural gas is a proven method and is considered the best suited to producing large amounts of hydrogen. In this regard, natural gas-rich Qatar is a hydrogen supplier of great potential. Japan, for its part, boasts an impressive worldwide performance record in storing and transporting large amounts of hydrogen, and leads

the world in liquefaction technology, particularly in the industrial gas and aerospace sectors.

This study was thus implemented based on the thinking that if Japan's world-class hydrogen liquefaction and storage technologies could be used to transport hydrogen produced in Qatar to Japan, it could contribute to increasing the added value of natural gas in Qatar, and to creating a low-carbon and hydrogen society in Japan.

2. Overview

Implemented with the participation of Kawasaki Heavy Industries, Ltd., this study examined the status of hydrogen production in Qatar and the feasibility of its transportation to Japan, by obtaining relevant information from QP, JCCP's counterpart in this study. It also examined the feasibility of hydrogen production, liquefaction and transportation operations in Middle East oil-producing countries around Qatar.

More specifically, as by-product hydrogen is generated from facilities such as natural gas and ethylene plants that are currently in operation, the study examined the feasibility of relying on by-product hydrogen as a source of hydrogen generation, in terms of supply amounts and cost, and surveyed the present utilization status of by-product hydrogen, in particular. A preliminary study was also made of hydrogen storage and transportation technologies in Qatar.



*Rendering of a liquefied hydrogen tanker
(provided by Kawasaki Heavy Industries, Ltd.)*

3. Observations

Through examinations in this study, there were found to be various issues to using by-product hydrogen generated from such sources as natural gas and ethylene plants in Qatar. It was thus considered too soon yet to press forward with a hydrogen liquefaction project in Qatar, and the study was decided to be brought to an end for the time being at the close of fiscal 2012.

However, the study had great meaning in terms of the fact that Japan's advanced technologies in the natural gas liquefaction field were introduced to Qatar, and that networks and relationships of trust were established with relevant parties in Qatar.

It is hoped that diverse forms of technical cooperation will continue to be implemented to further deepen ties between Japan and Qatar.

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