INTERVIEW

The Word's First Enhanced Oil (EOR) Recovery Project by Using CO_2 Emissions from the Power Plant

Project Financing for CO2-EOR Project

Interview with Director Noriyasu Matsuda, Division 1,
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JBIC signed in July 2014 a loan agreement totaling up to USD175 million (JBIC portion) with Petra Nova Parish Holding LLC (PNPH) in the United States, in which JX Nippon Oil & Gas Exploration Corporation (JX NOEX) and NRG Energy, Inc. (NRG), an American company, have joint equity stakes, in project financing in cofinance with a private financial institution (the total cofinanced amount: USD250 million).

In this project, CO_2 is recovered from the flue gas of the coal-fired thermal power plant in Texas and injected in the old oil field located 130 km from the plant to increase crude oil recovery, and JX NOEX secures a 25% interest in the oil field.

Director Matsuda

Project Financing for CO2-EOR Project in the United States

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In this project, NRG's subsidiary constructs a CO_2 recovery plant in a coal-fired power plant it owns in Texas, and recovered CO_2 is injected in the existing oil field in Texas to increase the recovery of crude oil. JX NOEX is participating in the project by indirectly investing 50% of equity in PNPH, which makes 25% of the interests in the oil field and enables it to acquire a disposal right of crude oil production commensurate with the existing interests.

The CO_2 recovery plant is composed of pre-processing facility of flue gas (desulfurization), CO_2 absorption and regeneration facility, CO_2 pressure transport facility, utility facility and others, and its CO_2 recovery capacity will be the world's largest 5,000 tons in proximity per day and the CO_2 recovery rate will be 90 %.

Serving the double purpose of CO_2 emission reduction and oil field recovery

This is a CO2-EOR (Enhanced Oil Recovery) Project that aims to build a CO_2 recovery plant in a W. A. Parish coal-fired thermal power generation plant owned in Texas by a subsidiary of NRG, the top independent power generator (IPP), and transport the extracted and recovered CO_2 to the West Ranch oil field, about 130 km away, whose 50 % interests are owned by PNPH in order to increase the production of crude oil.

"In getting crude oil, the primary recovery that uses natural energy obtains only part of the underground oil. That is why increased recovery technologies are used such as injecting high-pressured water or gas into the oil reservoir to increase production. In particular, increased recovery technology by using CO_2 is implemented globally. However, to date, the natural CO_2 coming out with the production of crude oil or natural gas is used generally, thus, as the amount of CO_2 able to be used is limited, there has been an issue of limitation in increasing production. On the other hand, research has been conducted on carbon capture and storage (CCS), sequestering emission gas from coal-fired thermal plants underground as a measure to cope with global warming. But cost is a major issue for this approach.

This project is a business that resolves these two issues with a single stroke, and this is the world's first large scale enhanced oil recovery project on a commercial basis that uses CO_2 recovered from a coal-fired thermal power plant." Director Matsuda explains the background and significance of this project.

JX NOEX owns a 25 % interest of West Ranch oil field by indirectly investing 50 % of equity in PNPH, which enables them to acquire a disposal right of crude oil production commensurate with the existing interests. The loan will partially fund the capital required for the acquisition of the interests and procurement of plant facilities for this project.

High future potential project leading to reduction in environment burden

It was the beginning of 2013 that JX NOEX asked JBIC for considering a loan.

"We judged that this project has a new feature and, if successful, will be able to realize many similar projects, as well as a promising business from the point of view of environmental conservation. However, because it is the world's first project, we need to assess the economic viability of the enhanced oil recovery that will become the source of cash flow and whether technological issues are adequately cleared. For CO_2 recovery and storage, a demonstration test started in 2011 in Alabama, and we made a site visit for study. But since this project is about 10 times the capacity of about 5,000 tons of CO_2 recovery/a day compared to the demonstration plant, whether it is commercially viable was a major point.

In fact, CO_2 recovery technology adopted in this

project is a high performance process developed jointly by Mitsubishi Heavy Industries, Ltd. and Kansai Electric Power Co., Inc., and the demonstration test in Alabama was jointly moving forward by Mitsubishi Heavy Industries, Ltd. and a US major power company. This project financing has also an aspect of supporting the propagation of Japanese company's environment technology." Director Matsuda stated.

Further, as an issue of structuring project financing, the relations between the participants are complex since the players are separate in CO_2 recovery, CCS plant and the pipeline transporting CO_2 and the EOR part. Thus there was the need to make explicit distribution of responsibilities.

"Although there were difficult problems in assessing and considering completion risk and operation risk, all the people involved had a strong motivation for the CO2-EOR project with high potential, and made persistent negotiations. As a result, we were able to structure a security package satisfactory as a lender. Project financing provided by JBIC for the projects in the natural resource sector have been few in the United States until now, but similar projects are expected to expand in the existing oil fields in that country. Thus I think this project finance has become the basis for them." Director Matsuda expressed his view.

Operation to start from 2016

West Ranch oil field plans to start to inject CO_2 from the fourth quarter of 2016 and increase crude oil production from the present about 500 barrels a day to about 12,000 barrels (average production during the project period). Also, CO_2 emissions into the atmosphere from W.A. Parish coal-fired thermal power plant are expected to be reduced by about 1.6 million tons per year.

"This project is expected to make it possible to produce additional crude oil from the existing oil field and contribute to simultaneously reducing burden on the global environment and increasing energy resources.

In addition, expanding this scheme to other regions will support the obtaining of oil field interests by Japanese companies and, further, the business of Japanese companies. Therefore, I consider providing support by drawing on a variety of financial facilities and schemes, and risk taking function." Director Matsuda talked about the future.