Bankability of *CCS* project from a lender's perspective: Lessons learned from financing *CO2EOR* project

6th APAC CCS Forum

"Developing a low-carbon economy"

Session 3: How to finance a low carbon economy

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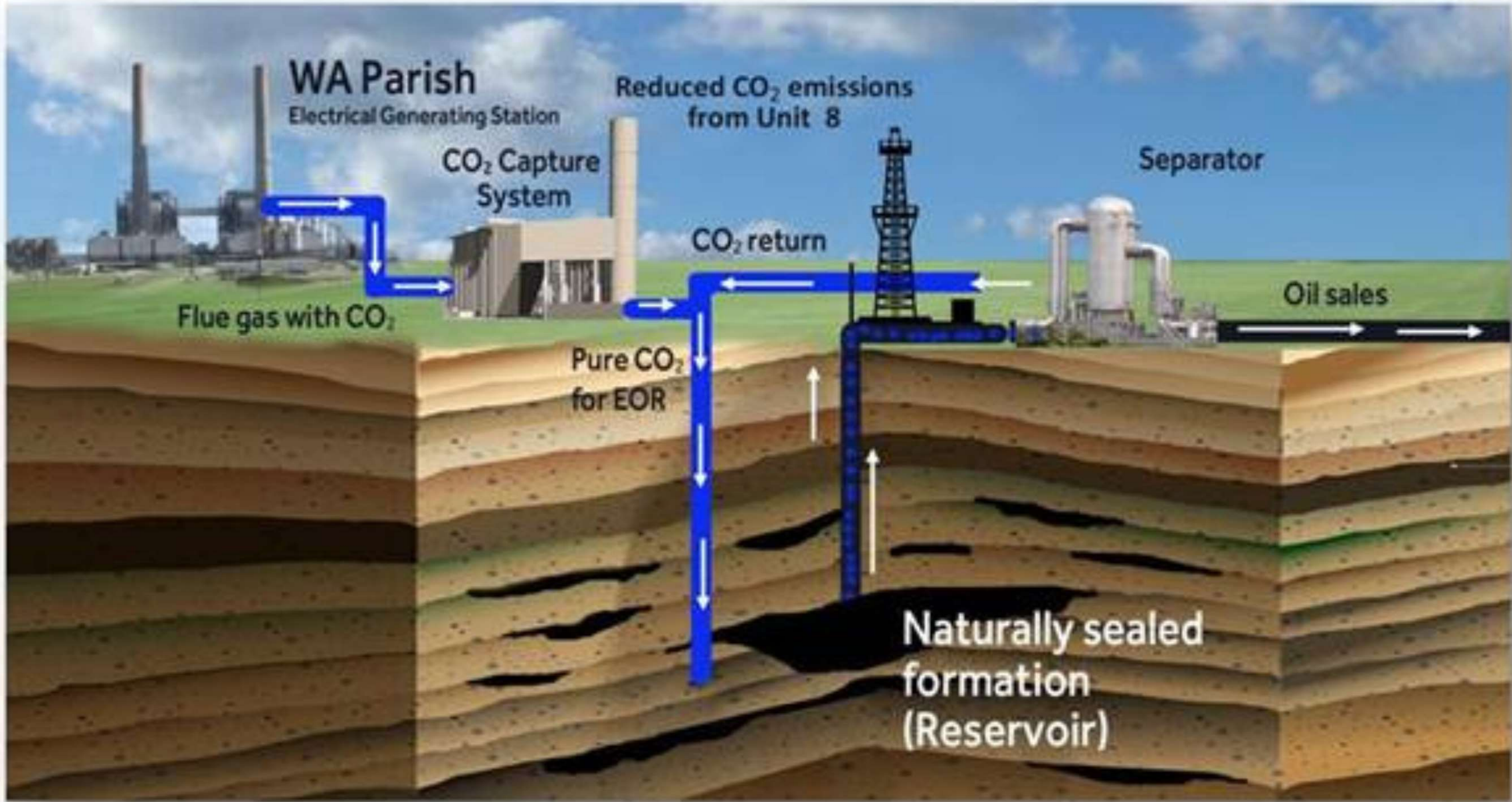
JBIC JAPAN BANK FOR INTERNATIONAL COOPERATION

Financing a low carbon economy: JBIC in the context

- JBIC is a Japanese government-backed financial institution and its finance is required to fall into one or more of the following four mandates
    - (i) *securement of natural resources*
    - (ii) *enhancement of industrial globalization*
    - (iii) *conservation of global environment*
    - (iv) taking measures against international financial crisis
- OECD Arrangement's Sector Understanding on the Export Credit for Coal-fired Electricity Generation Projects (November 17, 2015), applicable for the export of coal-fired power plants *without operational CCS/CCU*
- JBIC's ***GREEN*** facility (named after "Global action for Reconciling Economic growth and ENvironmental preservation") with the requirement to apply JBIC's *MRV* (*Measurement, Reporting and Verification*) guidelines
- JBIC's ***QI-ESG*** facility (named after "Global Facility to Promote Quality Infrastructure Investment for Environmental Preservation and Sustainable Growth): a new finance initiative to support "variety of infrastructure projects that contribute to global environmental preservation", announced at the International Conference on the Future of Asia (June 11, 2018)

Petra Nova Project as an example



Source: NRG/JX

Project description

Project Description:	Increase crude oil recovery through Enhanced Oil Recovery (*EOR*) technology, which injects into an oil well extracted and collected CO_2 (5,265 tons per day, or about *1.6 million tons per annum*) from the exhaust gas of a coal-fired power plant, utilizing a CO_2 recovery (*CCS*) plant.
Location:	WA Parish *Electric Generation Station*/ West Ranch *oil field*, Texas, U.S.A.
Project cost estimate at financial close:	Approx. USD 1,000 million, of which (a) Senior Debt: USD 250 million (JBIC: 175 million/Commercial : 75 million) (b) DOE Subsidies: USD 167 million (subsequently increased by 23 million)
Project Company:	Petra Nova Parish Holdings LLC ("*PNPH*"), a joint venture between NRG Energy, Inc. ("*NRG*") and JX Nippon Oil and Gas Exploration Corporation ("*JX*"), operates commercial scale post-combustion carbon capture project utilizing amine-based absorption technology to capture at least 90% of the carbon dioxide from nominal *240 MW equivalent flue gas slipstream* taken of Unit 8 (640MW) at NRG's WA Parish Electric Generation Station. The captured CO_2 is being dried, compressed and transported via an *81-mile pipeline* to the West Ranch oil field, where it is used for EOR operations.
Schedule:	Financial Close followed by FID: July 2014 Commercial Operation: December 2016 Mechanical Completion: March 2017

Certain features of the Project

- *Clean Coal Power Initiative Program*: DOE subsidies for CCS project utilizing flue gas from coal fired power plant
- *45Q Tax Credit*: Applicable to CO_2 emitted from industrial sources that is fixated either through injection or utilization
- Commercial viability: The project was designed to fund the capital cost of CCS plant by (i) the CO_2 sales revenue as well as (ii) the *oil sales revenue* from EOR operations to which the project itself has 50% equity interest
- Security and account structure designed under the usual *project finance* practices, allowing sponsors to leverage their investment
- Moderate debt size and repayment profile with reference to the *EOR production forecast* and required DSCR ratio
- CCS operates under the power and steam supply by its *own CCGT* power plant, its surplus being sold to the market, thereby providing small but long-running cash flow to the project
- Adequate level of *sponsor support* mechanics until the “Financial Completion”

What is required to make CCUS financeable?

- Finance can do little in commercially *incentivizing* CCUS investment, it is primarily the domain of policy guidance and support. Finance will do to help *enhancing* commercial viability for CCUS investment, by providing long-term stable loan depending on the ticket of investment and the associated cash flow
- Banks will require the project to apply *proven* technology; successful construction and operation precedents of commercial scale are the key
- When it comes to a large-ticket project that involves senior debt, adequate level of *risk allocation* needed to enable commercial banks' participation
- ***Petra Nova project***: CCUS project getting into commercial operation with (i) the EPC contract *technically proven* by preceding pilot projects, (ii) strong *sponsors' commitment and interest alignment*, (iii) incentives by government *subsidies and tax credits*, (iv) *EOR cash flow* with sufficient oil reserve and (v) *long-term senior debt* as well as *mezzanine finance* structured by adequate risk allocation among the relevant parties; all these factors are determinant
- CCS has not yet been deployed on a scale commensurate with the ambitions articulated a decade ago. There seems to have been a lengthy discussion as to how to *incentivize the CCS investment* (*e.g.* tradable tax credit, CfD and other subsidies, CCS certificate, public procurement …) but no clear answer to the question to date. Can EOR be a way out?

Thank you for your attention

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