

Carbon Capture and Storage: Prospect & Development in Indonesia



Research and Development Centre
for Oil and Gas Technology
(LEMIGAS)

Fakhriyadi Saptono

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LEMIGAS



OUTLINE

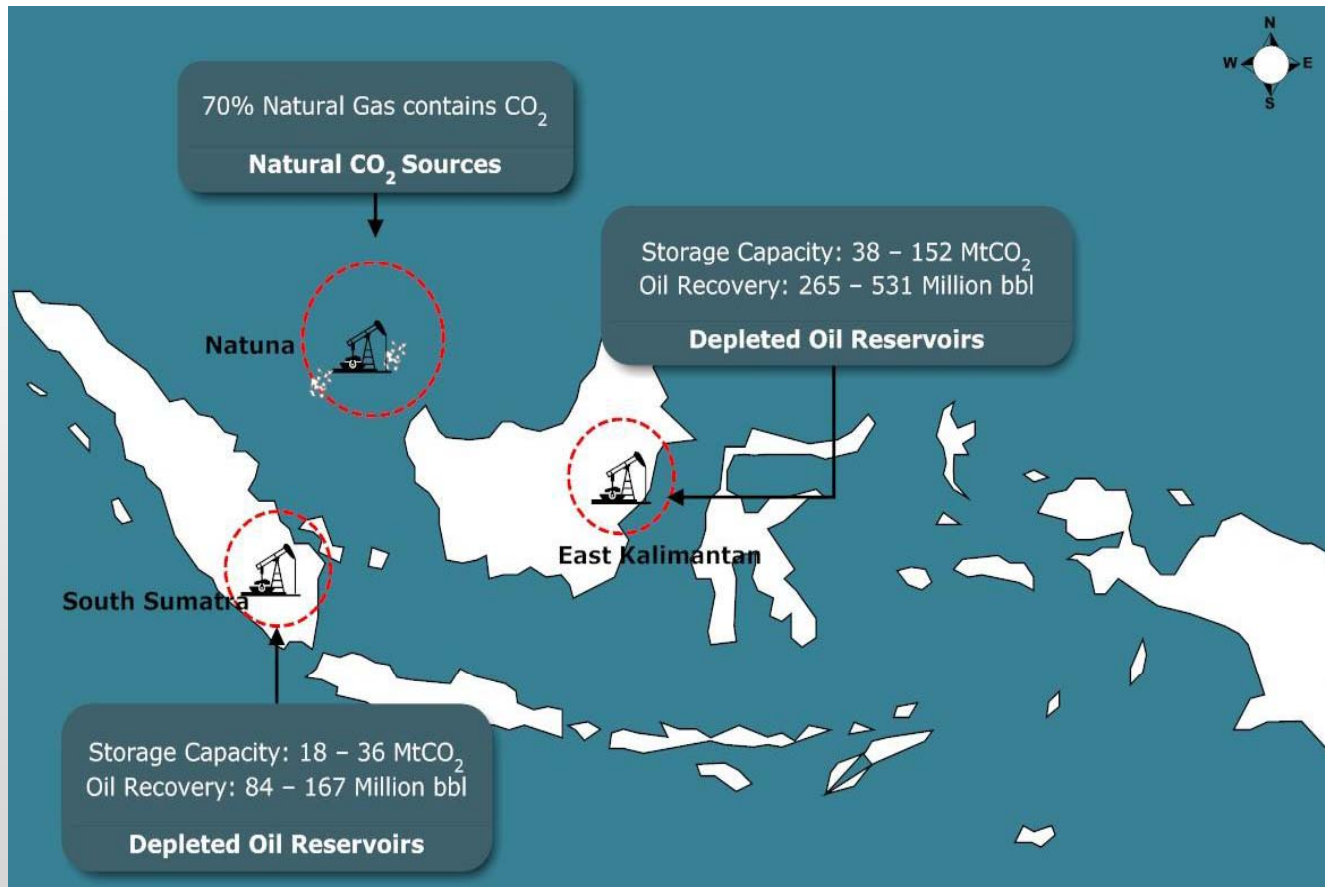
1. Indonesia's Pathway in CCS
2. Prospect of CCS Deployment
3. Possible CCS Scheme in Indonesia
4. R&D - Roadmap
5. Main Issues and Challenges for CCS Deployment in Indonesia
6. Conclusions

Indonesia's Pathway in CCS (1)

1. Preliminary studies on CCS-EOR in East Kalimantan & South Sumatra (2003 – 2005)
2. Joint study on CCS potential with industries:
 - Sojitz & Mitsubishi (2005); Total Indonesie (2007); & Shell Exploration Company B.V (2008)
3. Became a founding member of Global CCS Initiatives (GCCSI) led by Australia (April 2009)
4. Joint Study with UK Government (November 2009)
5. Other Cooperations

Indonesia's Pathway in CCS (2)

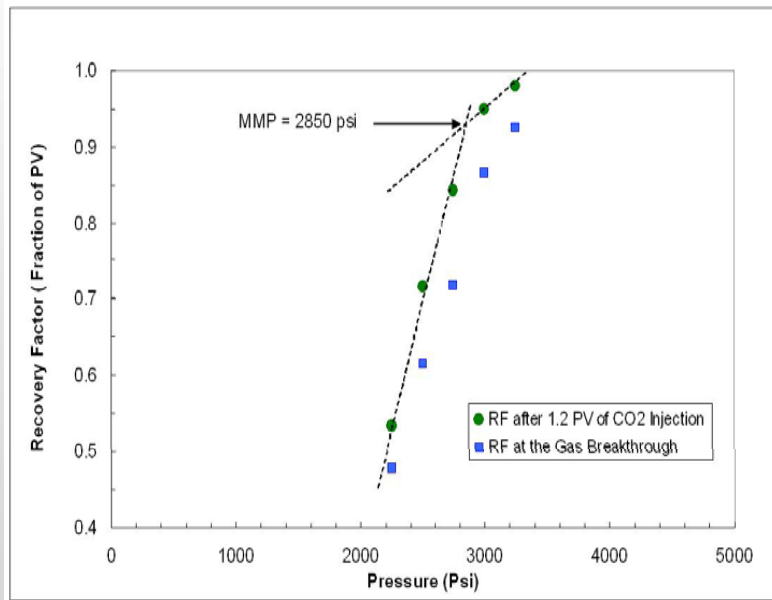
1. Preliminary studies on CCS-EOR (2003-2005)



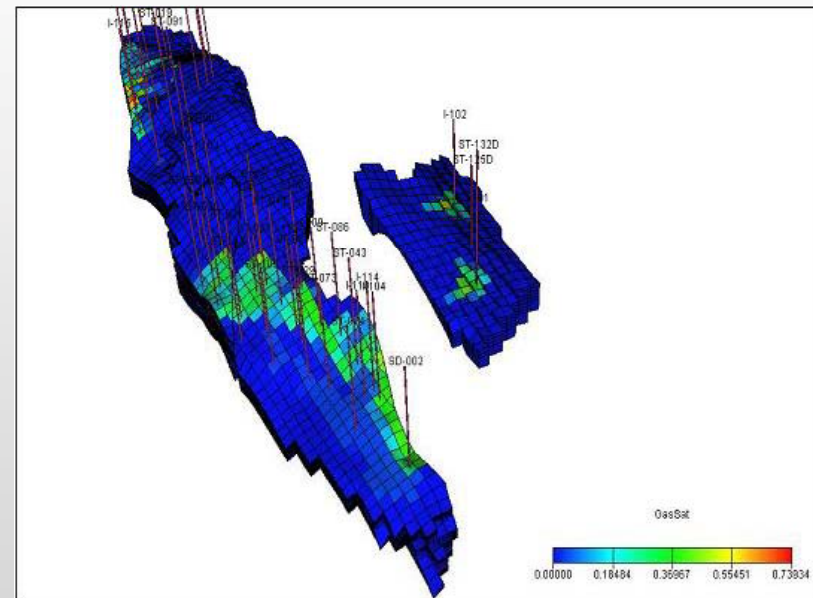
Indonesia's Pathway in CCS (3)

2. Joint study on CCS potential with industries:

- Sojitz & Mitsubishi (2005); Total Indonesie (2007); & Shell Exploration Company B.V (2008)



Minimum Miscibility Pressure



Reservoir Simulation

Indonesia's Pathway in CCS (4)

3. Became a founding member of Global CCS Initiatives (GCCSI) led by Australia (April 2009):

- GCCSI was launched on 19th September 2009 by Australian Prime Minister Kevin Rudd.
- The objective of GCCSI: to speed up the development of carbon capture and storage (CCS) technology globally.
- GCCSI will work cooperatively with other countries and with industry to develop and commercialize CCS technologies to help reduce global CO₂ emissions.
- LEMIGAS has become a founding member of GCCSI since September 2009.

Indonesia's Pathway in CCS (5)

4. Joint Study with UK Government:

- Title: Understanding Carbon Capture and Storage Potential In Indonesia
- Study Objective: To develop an understanding of the requirements associated with deploying CCS in Indonesia by addressing technical, commercial and regulatory aspects of CCS deployment.
- A first comprehensive study to identify CCS potential deployment in Indonesia
- CCS Study Working Group: Ministry of Energy and Mineral Resources (BALITBANG/LEMIGAS) , State Ministry of Environment, Shell, PLN, World Energy Council, and supported by UK Embassy in Jakarta
- Status: Completed (November 2009)

Indonesia's Pathway in CCS (6)

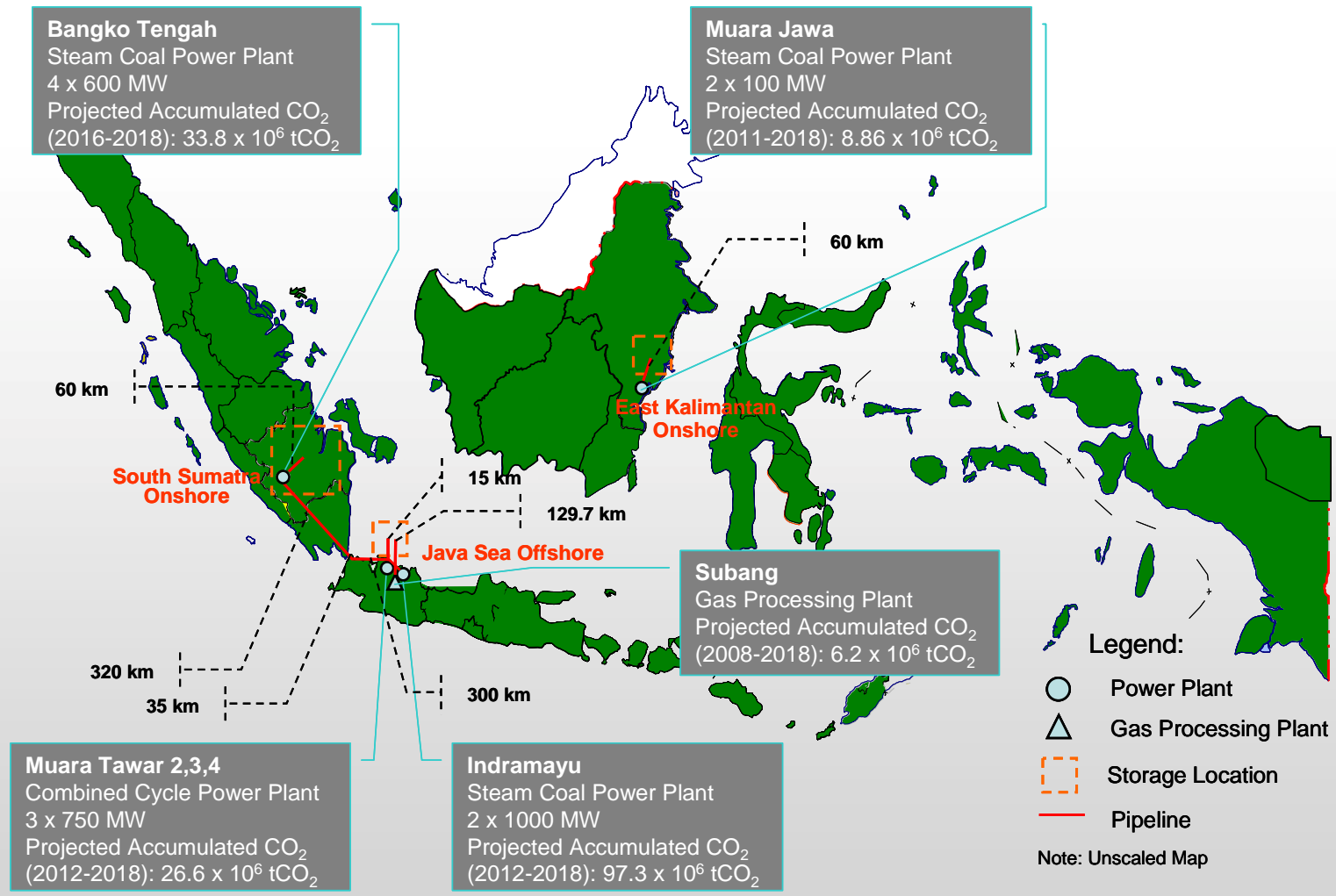
5. Other Cooperations:

- International Energy Agency (IEA):
 - ✓ Cooperation on CCS Roadmap Development and establishment of National Regulatory Framework
- Ministry of Economic, Trade & Industry (METI), Japan:
 - ✓ Knowledge sharing and Capacity Building
 - ✓ Identification on Possible Cooperation Areas
 - ✓ Consideration of specific procedures for future cooperation such as MoU or Cooperation Agreement.
- LEMIGAS-TOTAL-IEA CCS Joint Workshop, 27-28 October 2010 :
 - ✓ CCS Technology Roadmap
 - ✓ Accelerating CCS deployment in Indonesia, opportunities and challenges
 - ✓ Progress and update of CCS Technology and its potential applications

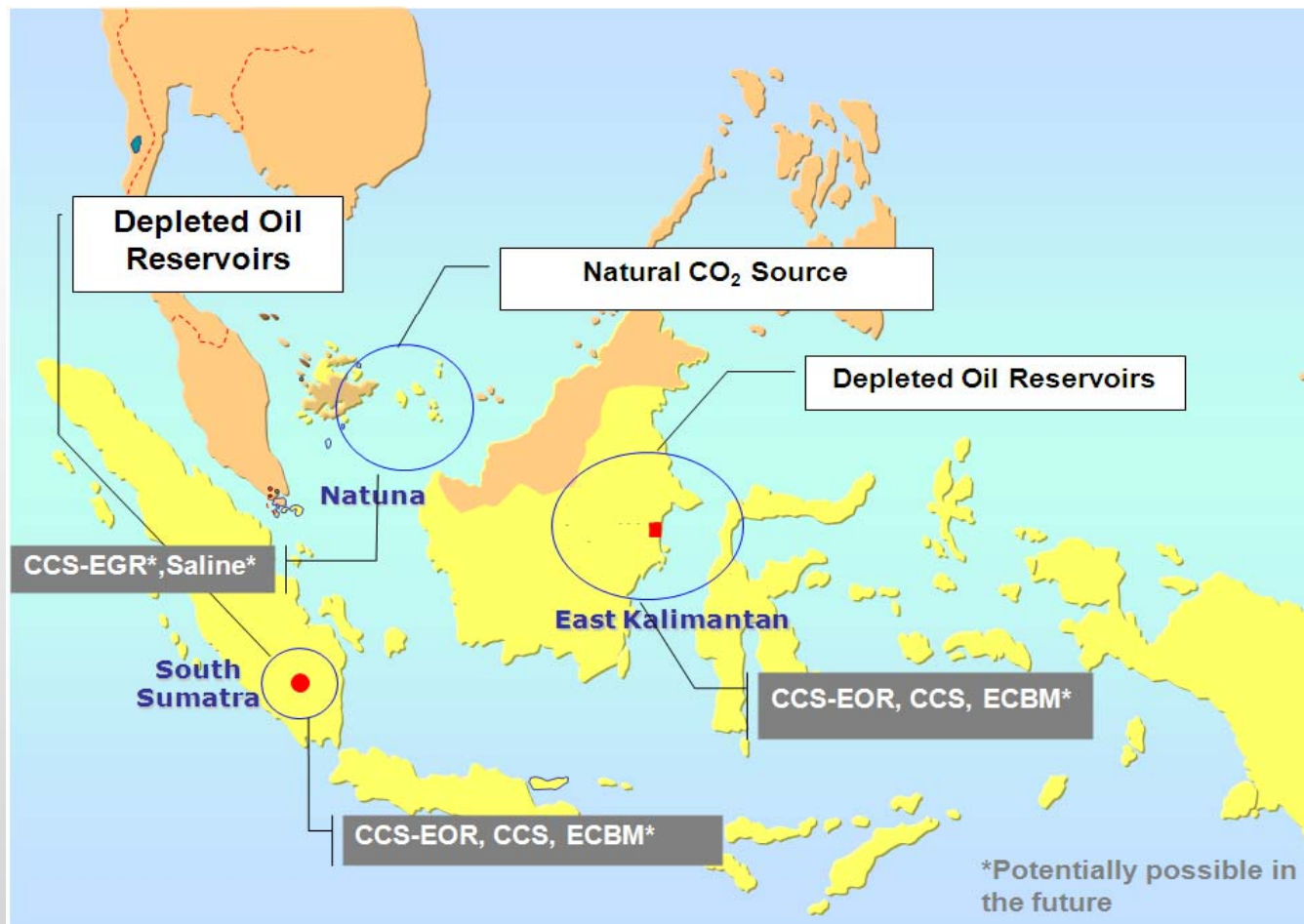
Prospect of CCS Deployment

- New build Coal-fired power plants as a target from large point sources of CO₂ emissions
- The utilization of CO₂ in petroleum industry particularly for enhanced oil recovery (EOR)
- Compatible with current energy infrastructures
- Government non-binding commitment to reduce country emissions to 26% in 2020.

Possible CCS Scheme in Indonesia




Potential Area for CCS



R&D - Roadmap:

- CO₂ Emission Sources Identification
 - Establishment of National Regulatory Framework
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- CO₂ Capture Technology
 - CO₂ Transport Technology
 - Site Selection Methodology
 - Geological Storage Potential

Main Issues and Challenges for CCS Deployment in Indonesia:

- No public awareness of CCS and lack of technical capacity
- CCS costs must be reduced
- No Legal and Regulatory Frameworks
- Need accelerating investment on R&D
- Demonstration projects are needed in developing countries funded by international sources

Conclusions

- Deployment of CCS in Indonesia is aligned with national energy policy and Gol's commitment to reduce 26% country emission.
- New coal power plant is potentially fitted with capture system.
- CCS-EOR will be high on agenda
- Early opportunity of CCS on Saline Aquifer in Natuna
- Increase of capacity building is essential for disseminating CCS in Indonesia



Thank You
