Carbon Capture and Storage: Prospect & Development in Indonesia

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

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OUTLINE

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Indonesia’s Pathway in CCS (1)


2. Joint study on CCS potential with industries:
   - Sojitz & Mithsubishi (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)


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Indonesia’s Pathway in CCS (3)

2. Joint study on CCS potential with industries:

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Minimum Miscibility Pressure

Reservoir Simulation

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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 CO\textsubscript{2} emissions.
- LEMIGAS has became 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)

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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.

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Possible CCS Scheme in Indonesia

Bangko Tengah
Steam Coal Power Plant
4 x 600 MW
Projected Accumulated CO₂ (2016-2018): 33.8 x 10⁶ tCO₂

Muara Jawa
Steam Coal Power Plant
2 x 100 MW
Projected Accumulated CO₂ (2011-2018): 8.86 x 10⁶ tCO₂

South Sumatra
Onshore

East Kalimantan
Onshore

Subang
Gas Processing Plant
Projected Accumulated CO₂ (2008-2018): 6.2 x 10⁶ tCO₂

Indramayu
Steam Coal Power Plant
2 x 1000 MW
Projected Accumulated CO₂ (2012-2018): 97.3 x 10⁶ tCO₂

Muara Tawar 2,3,4
Combined Cycle Power Plant
3 x 750 MW
Projected Accumulated CO₂ (2012-2018): 26.6 x 10⁶ tCO₂

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Potential Area for CCS

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R&D - Roadmap:

- CO₂ Emission Sources Identification
- Establishment of National Regulatory Framework

- 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

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Conclusions

• Deployment of CCS in Indonesia is aligned with national energy policy and GoI’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

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