

CAGS Project Proposal on Environmental Risks

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Background

- Environmental risks:
 - impact the shallow underground water
 - biosphere
- A need to build a system to ensure CCS projects are subject to an effective environmental risk management.

Background



- China has enacted
 - *Environmental Impact Assessment (EIA) Law,*
 - *Environmental Protection law,*
 - *Air Pollution Control Law,*
 - *Water Pollution Control Law*
 - MEP has carried out EIA rules for many kinds of project.
- However, there is no specific definition about how to incorporate environmental impact and risks of CCS within the framework of EIA, or *Air Pollution Control Law,* or *Water Pollution Control Law.*



Background

- Development planning on CCS
- Demonstration projects
- More CCS projects will go into operation in the next decade.
- So it is urgent for China to develop some guidelines about environmental management of CCS to provide useful recommendations to policymakers and stakeholders.
- We are lack of such experiences and need to do further research.

Main Tasks (1)

- **Study on potential environmental impact and risk of CO2 storage**
- Identify the features and processes of potential environmental impact and risk of CO2 storage
- focus on analyzing the impact on soil, groundwater, regional/local pollutants, human health and climate change mitigation of CO2 storage.

Main Tasks (2)



- **Review on the management measures for environmental impact and risks of CO₂ storage outside China**
- Review and summarize abroad experiences on environmental impact and risk management about CCS, especially about the relationship between existing related laws and CCS environmental management, environmental impact assessment, approval, environmental management rules, environmental risk monitoring and so on.

Main Tasks (3)

- **Study on monitoring technologies and methods of CO₂ geological storage**
- Collect related literatures and determining on potential escape mechanisms and key leaking risk indexes.
- Research on potential escape mechanisms, such as CO₂ gas pressure exceeds capillary pressure and passes through cap rock, free CO₂ leaks from reservoir into upper aquifer, CO₂ escapes via poorly plugged old abandoned well, natural flow dissolves CO₂ at CO₂/water interface and transports it out of closure, and so on.
- Assess the CO₂ leakage impact to water resources and research on key technologies and method including geophysics, geochemistry, remote sensing, well drilling, numerical modeling etc.
- Set a guideline on monitoring technologies and methods of CO₂.

Main Tasks (4)



- **Develop environmental management framework of CO₂ storage for China**
- Based on the environmental impact of CO₂ storage, some laws and environmental regulations, we will identify the key problems to develop environmental management for CCS in China, and suggest some indicators and some rules recommendations for China to assess environmental impact, manage environmental risk of CO₂ storage, and monitor and approve the CCS projects.

Partners



- Director Cao Dong (Chinese Academy of Environmental Planning)
- Dr. Jiang Hong-qiang (Chinese Academy of Environmental Planning)
- Dr. Li Xiao-chun (Institute of Rock and Soil Mechanics, CAS)
- Dr. Guo Jian-qiang (Center for Hydrogeology and Environmental Geology, CGS)
- Dr. Sun Sheng (Center for Hydrogeology and Environmental Geology, CGS)
- Dr. Zhang Jiu-tian (Administrative Centre for China's Agenda 21)

Time Plan



- 2009.09-2009.12 finish the studies for potential environmental impact and risk of CO₂ storage
- 2010.01-2010.04 finish the review of the management measures for environmental impact and risks of CO₂ storage
- 2010.05-2010.10 finish the study on monitoring technologies and methods of CO₂ geological storage
- 2010.11-2011.05 finish the analysis for China to develop environmental management framework of CO₂ storage
- 2011.06-2011.08 finish the whole work