

ARTS & SCIENCES PROGRAM

DISTINGUISHED SCHOLARS SEMINAR 2008

Presenter: **Mr. Mahmut Sengul**
Vice President
Schlumberger Carbon Services
Middle East and Asia



Wednesday, 14 May 2008, 12:00 - 13:00
Lecture Hall 2123, Bu Hasa

Carbon Capture and Storage Dual Benefit to Industry

Abstract

The prospect of global warming is a matter of genuine public concern. The concentration of carbon dioxide in the atmosphere has been increasing since industrialization in the 19th century. There is a wide consensus from extensive research in the last three decades that rapid climate change is already happening, that global average temperatures are increasing at unprecedented rates and mankind is having a visible impact on the world's climate. Contributors of the CO₂ emissions in can be grouped under three categories:

Point sources - Industrial plants, oil and gas processing sites, power plants;

Line sources - Road transportation vehicles and,

Scattered sources - Residential areas, buildings.

Oil production in Middle East Giant reservoirs relies on injection of water and gas into hydrocarbon bearing formations. Sustainable production achieved by maintaining the reservoir pressure by drive energy of water or gas. Water supplied from deeper aquifers or sea. In tighter formations water is not effectively sweeping the oil or gas in this case natural gas is being injected into these reservoirs in onshore and offshore reservoirs in Middle East. Source of the injection gas is either rich hydrocarbon gas or lean. In both cases valuable commodity could be used for export sale.

Reducing CO₂ atmospheric concentrations by capturing emissions at the source—power plants, steel, cement factories or chemical units—and then storing them in subsurface reservoirs is thought by many scientists to be a reliable solution until emission-free energy sources are developed and viable. The current options for captured CO₂ utilization are; Enhanced Oil Recovery (EOR), Enhanced Coal Bed Methane Recovery (ECBM), Enhanced Gas Recovery (EGR), Food processing applications, Mineral products, Fertilizer manufacture, Algae growth promoter, enhanced plant growth.

Capture of CO₂ from major industrial sites and inject into oil reservoirs for Enhanced Oil Recovery purposes will bring following benefits:

- Minimizing environmental impact, reducing CO₂ emissions drastically
- Saving rich hydrocarbon gas for sales,
- Increasing oil production, by converting waste CO₂ into valuable commodity
- Image in the global level and participate CO₂ trading, CDM schemes

CO₂ EOR is likely to become a more important part of the future oil production. Safe and reliable reservoir development, production, injection operations, reservoir monitoring and technological advancements for handling sour oil & gas will be the main focus of the service industry.

Crucial elements in CO₂ storage are site selection, well field development and reliable monitoring of CO₂ migration behavior and storage volumes. An innovative seismic monitoring techniques, has recently been developed with the application of time-lapse (4D) seismic technology and advanced reservoir simulation to optimize CO₂ storage operations. Well design, cementing, completions techniques and long life cycle mechanical integrity assurance are currently subject of many R&D projects. What is unique for CO₂ EOR starting from reservoir modeling, recovery estimate, current state of the R&D projects, flow assurance problems, production operations? These questions will be investigated in our talk.

Open to all. For details, contact Mirella Elkadi: melkadi@pi.ac.ae