

**CO<sub>2</sub> CAPTURE AND SEQUESTRATION  
STATUS AND PROSPECTS  
OIL & GAS INDUSTRIES  
SEMINAR ON CCS  
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- CCS and global concerns
- CCS- its relevance and inevitability
- Scope in up/mid stream oil and gas sector
- CCS- Indian prognosis

# Potential

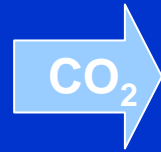
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- Can contribute up to 15-55% of cumulative mitigation world wide until 2100(IPCC)
- Individually most of the processes involved well established

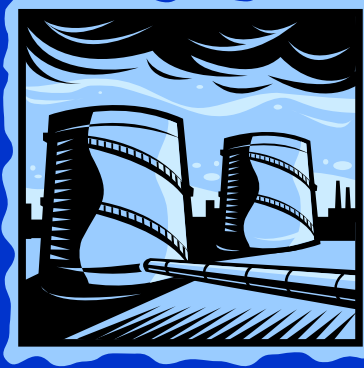
- **Do we have sufficient storage?**
- CO2 storage capacity likely to exceed 2 trillion tonnes(IPCC 2005 report)

# Process Chain of Carbon Capture and Storage

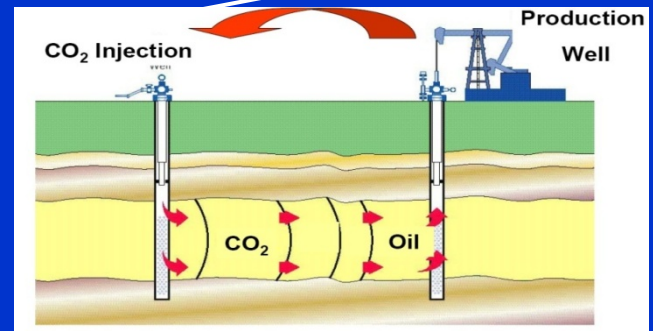
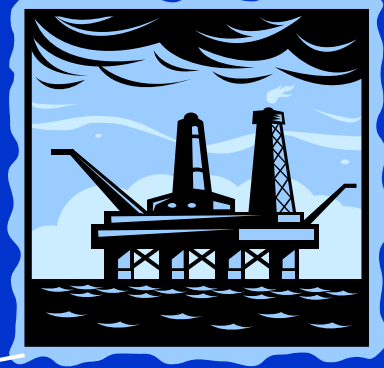
CO<sub>2</sub> Capture from source



Pipeline

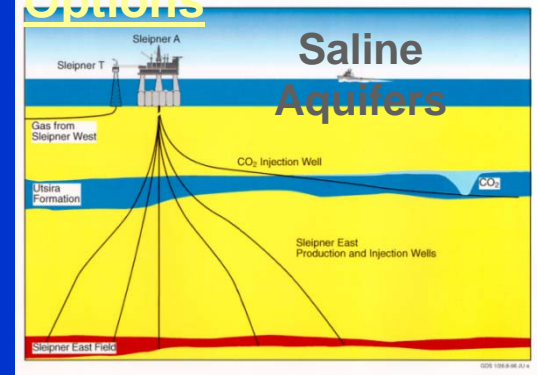


Underground Storage



Enhanced Oil Recovery

Storage Options



## Global concerns: Is CCS worth an endeavour?

- Too costly
- Insignificant short term return
- Zero incentive-- UNFCCC's reluctance
- Long term efficacy
- Leakage potential
- Safety

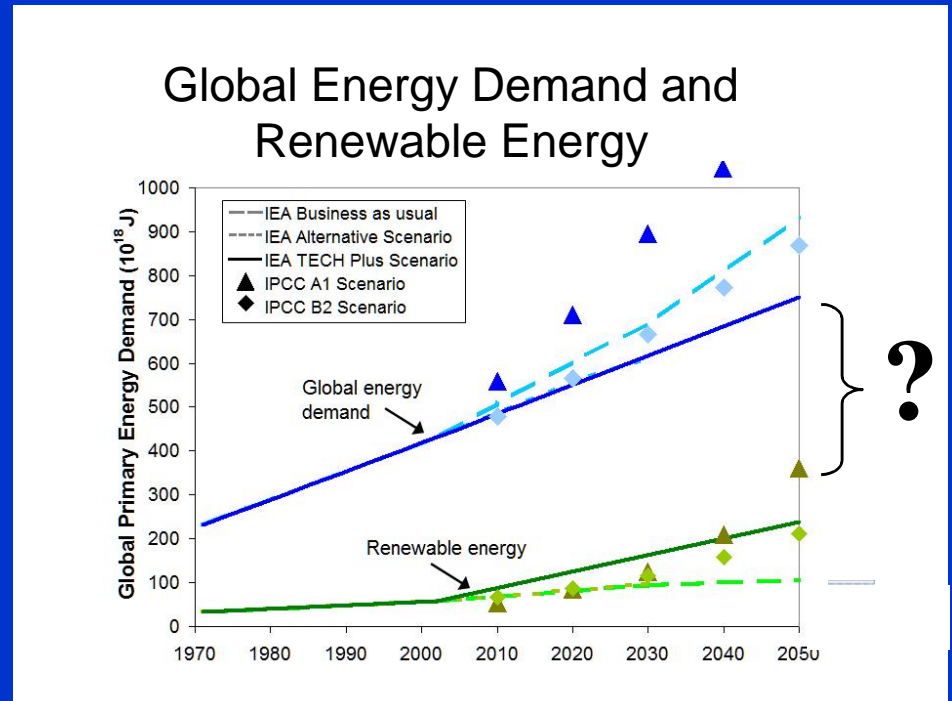
# CCS– Is it relevant and important?

- Relevant and important if
  - ❖ Fossil fuel remains the major source of energy; because
    - ❖ Only known process for long term mitigation
    - ❖ Only known process for large scale mitigation at one go
    - ❖ Only known process without possibility of manifestation of CO<sub>2</sub> at some other time and place.
- Irrelevant and unimportant if
  - ❖ Fossil fuel ceases to be the major source of energy

**We are to decide.**

# CO<sub>2</sub> emission targets

- Rising energy demand cannot be met by Renewables alone
- CO<sub>2</sub> reduction targets can't be met by Renewables & energy efficiency alone



**CCS is a key solution for combating climate change, within a portfolio of solutions**

# Can CCS be made worth the endeavour?

- Extensive R&D for establishing long term efficacy
- Rigorous monitoring of established projects
- Benefits through EOR
- Supplement with incentives (recognition by UNFCCC)

## CCS projects-- Prerequisites

- Assured Source
- Technique to capture CO<sub>2</sub>
- Availability of a sink
- Technique to transport CO<sub>2</sub> from source to sink
- Availability of effective monitoring system

## CCS– Scope in up/mid stream O&G sector

Prerequisites	Possibility	Reason/ Special case, if any
Source	Poor	Except if there is a sour gas source
Capturing technique	Good	Amine capture is a common technique
Sink	Assured	All depleted reservoirs
Transport'n technique	Good	Transportation is one of the O&G operations
Monitoring	Assured	Can undertake required surveys.

## CCS– Scope...contd.

- The scope of CCS projects are limited except for an assured source
  - ❖ Possible sources
    - ❖ Plants processing sour gas
    - ❖ Flue gas
    - ❖ Tie up with other sector

## CCS– possibility in ONGC

### Limited scope

- ONGC– an up and mid stream O&G company
- Most reservoirs are sweet oil bearing

### Possibility

- Offshore reservoirs as they have sour gas
- Flue gas from in situ combustion at Mehsana Asset

## CCS– Its future in India

- India is a member of Carbon sequestration leadership forum(CSLF)
- Undertakes R&D on CCS as per CSLF.
- Govt directive about the CCS project is necessary
- Industrial synergy is imperative for better CCS
- Excellent opportunity for up/mid stream O&G sector

# CCS and synergy– Future of Sustainable Development

Thank you