

# Carbon Capture and Storage

## A Techno-Economic Perspective

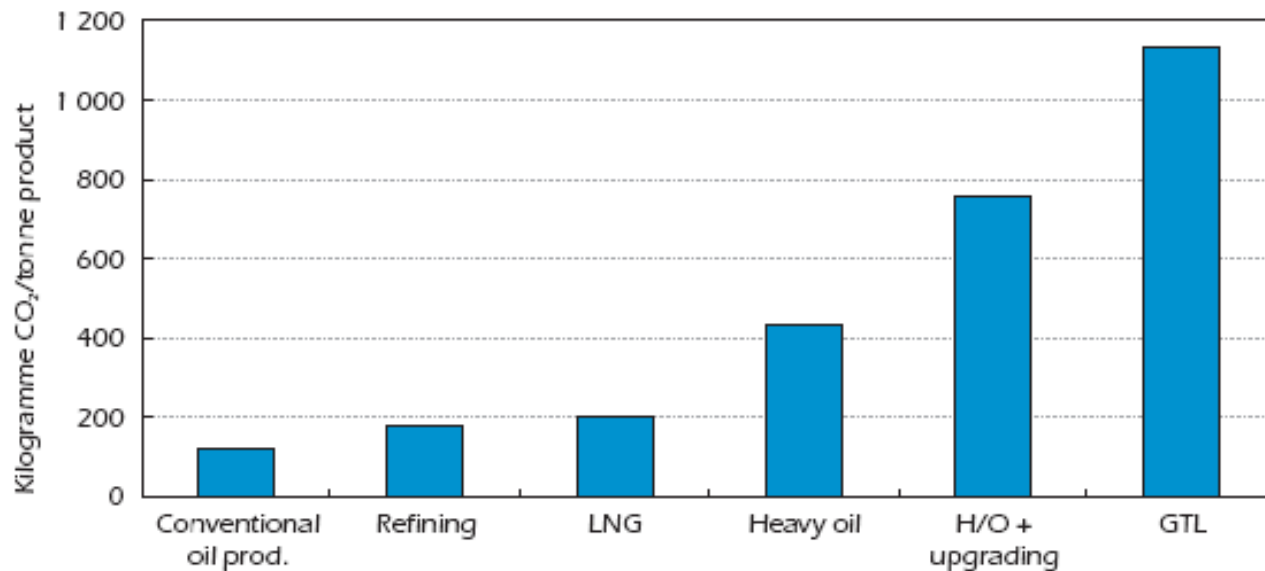
Vikram Rao  
Executive Director  
Research Triangle Energy Consortium



# Carbon capture and storage is a key to address

- Clean electricity objectives
- High carbon footprint of marginal barrel of oil

# CO<sub>2</sub> emissions (in kg) per Tonne of Product for Upstream and Downstream Operations

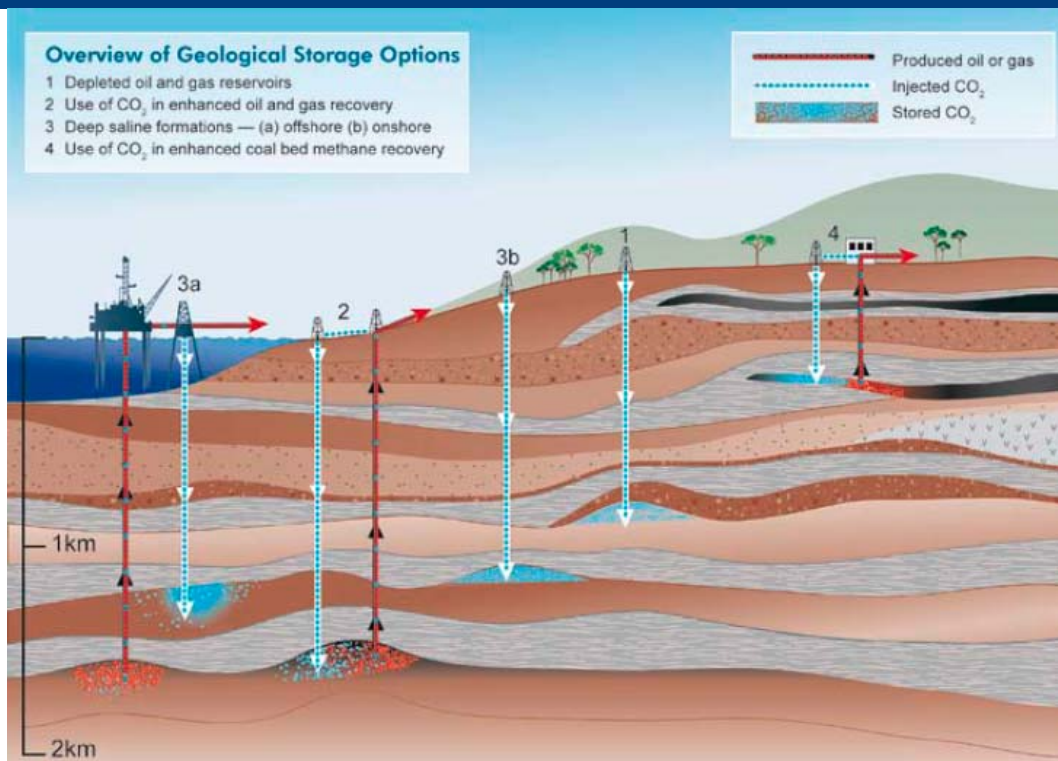


Sources: IEA, 2005a; Klovning, 2007.

# Carbon Capture and Storage : Components

- Capture: pre and post-combustion
- Transport to storage site
- Storage and monitoring

# Saline Aquifers Offer the Greatest Potential for CO<sub>2</sub> Storage



Reservoir type	Lower estimate of storage capacity (GtCO <sub>2</sub> )	Upper estimate of storage capacity (GtCO <sub>2</sub> )
Oil and gas fields	675 <sup>a</sup>	900 <sup>a</sup>
Unminable coal seams (ECBM)	3-15	200
Deep saline formations	1,000	Uncertain, but possibly 10 <sup>4</sup>

# Principal Challenges in Storage

- Geologic seals to prevent leakage
- Size of reservoirs to store
- Inject rapidly without rock fracture

# Carbon Capture and Storage

## A Techno-Economic Perspective

Capture Technology  
Dr. Raghurir Gupta

Techno-Economics of Transport and Storage  
Dr. Lincoln Pratson