

# **Carbon Capture & Storage: Policy Issues & Challenges**

U.S. Senator Jeff Bingaman

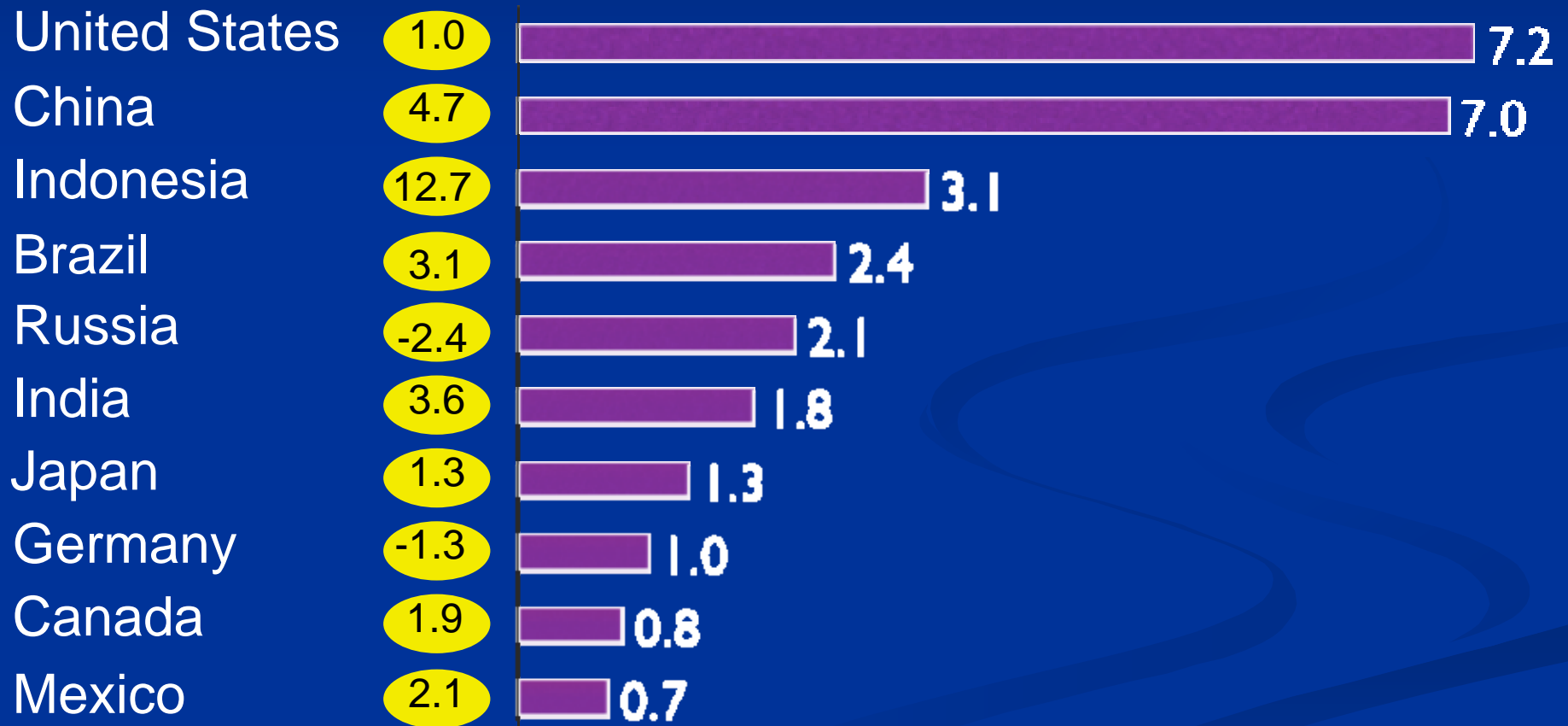
The Edison Foundation – CCS Meeting

March 3, 2008

# Why is CCS needed?

Annual growth rate  
1990-2005 (%)

Emissions\*  
Gigatons CO<sub>2</sub>e



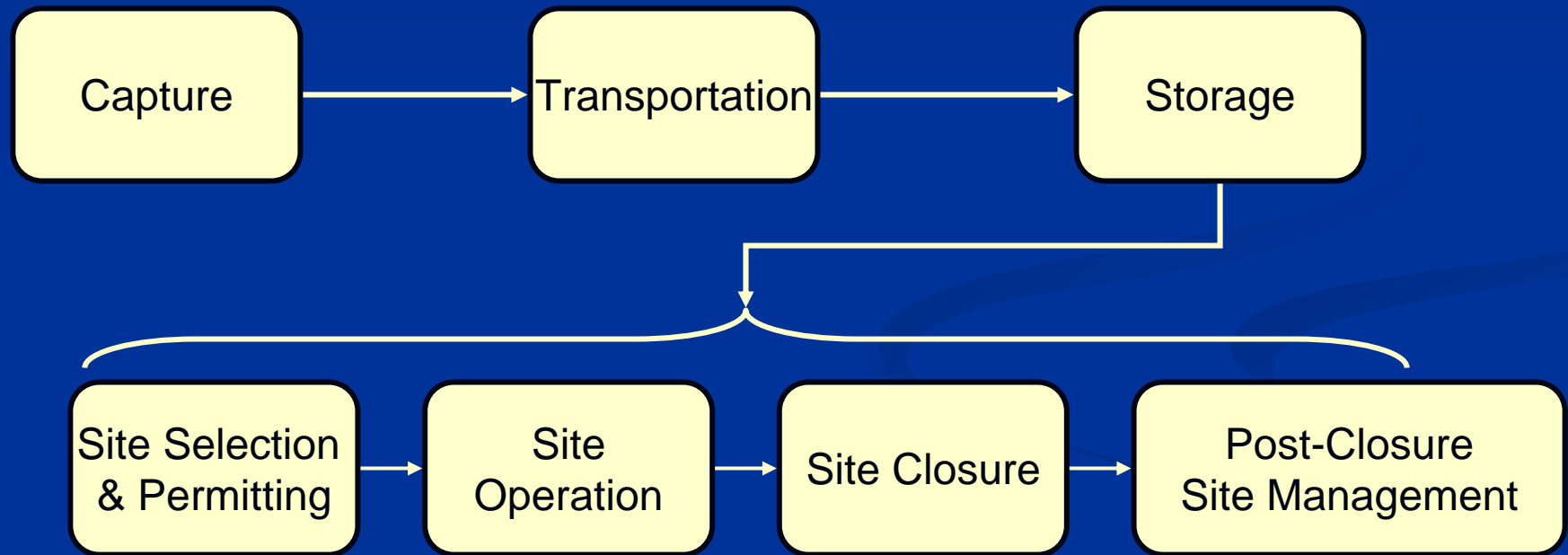
\* Includes emissions associated with deforestation and land-use changes

Source: McKinsey analysis of data from IEA, EPA, WRI, UNFCCC

# Energy Independence & Security Act of 2007

- CCS research, development, and demonstration program at the DOE
- Geologic storage training & university based research programs
- CO<sub>2</sub> storage capacity assessment for geologic systems and terrestrial ecosystems
- CO<sub>2</sub> storage inventory
- Policy framework for geological storage on public lands

# Integrated CCS Program



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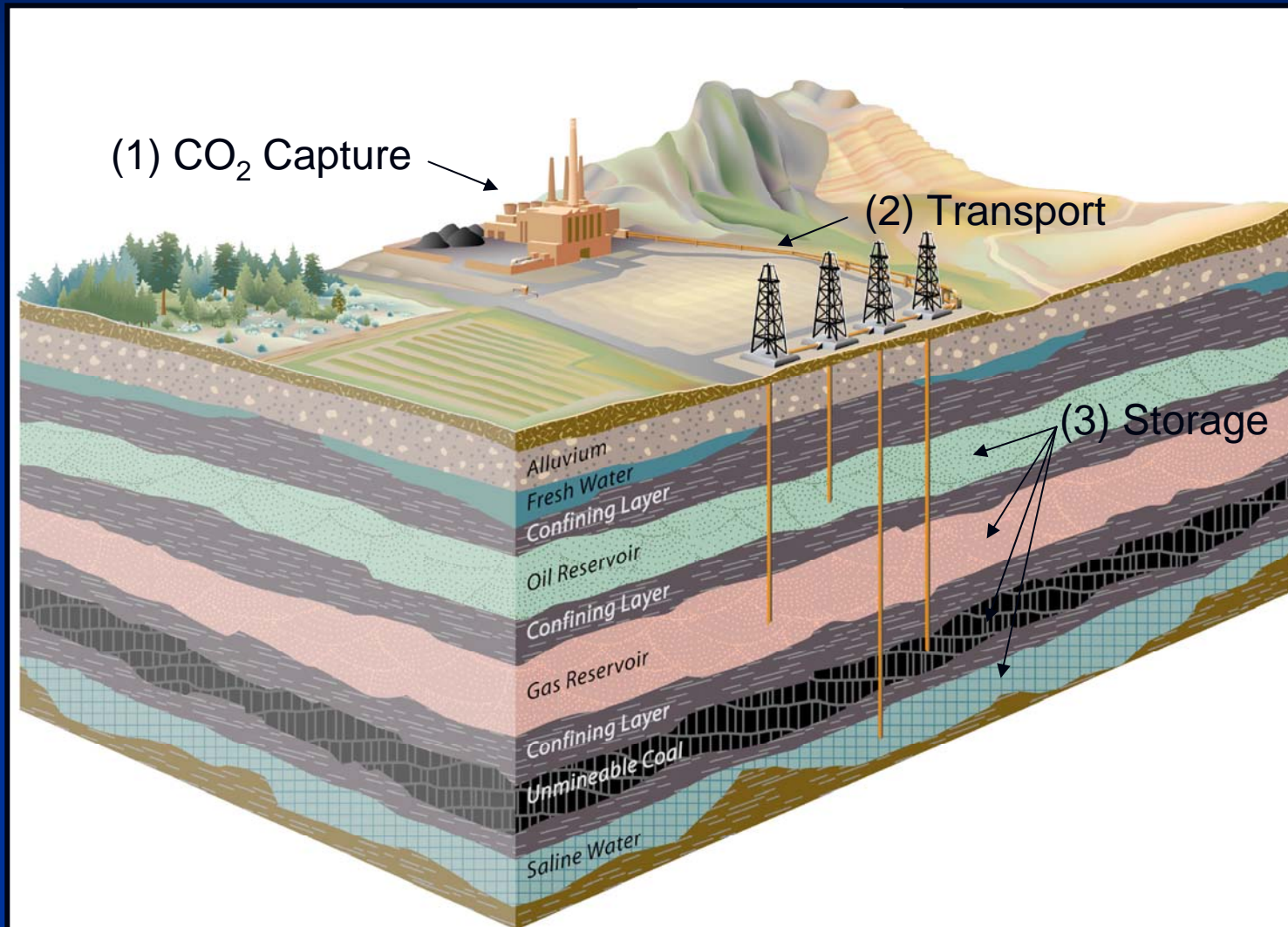
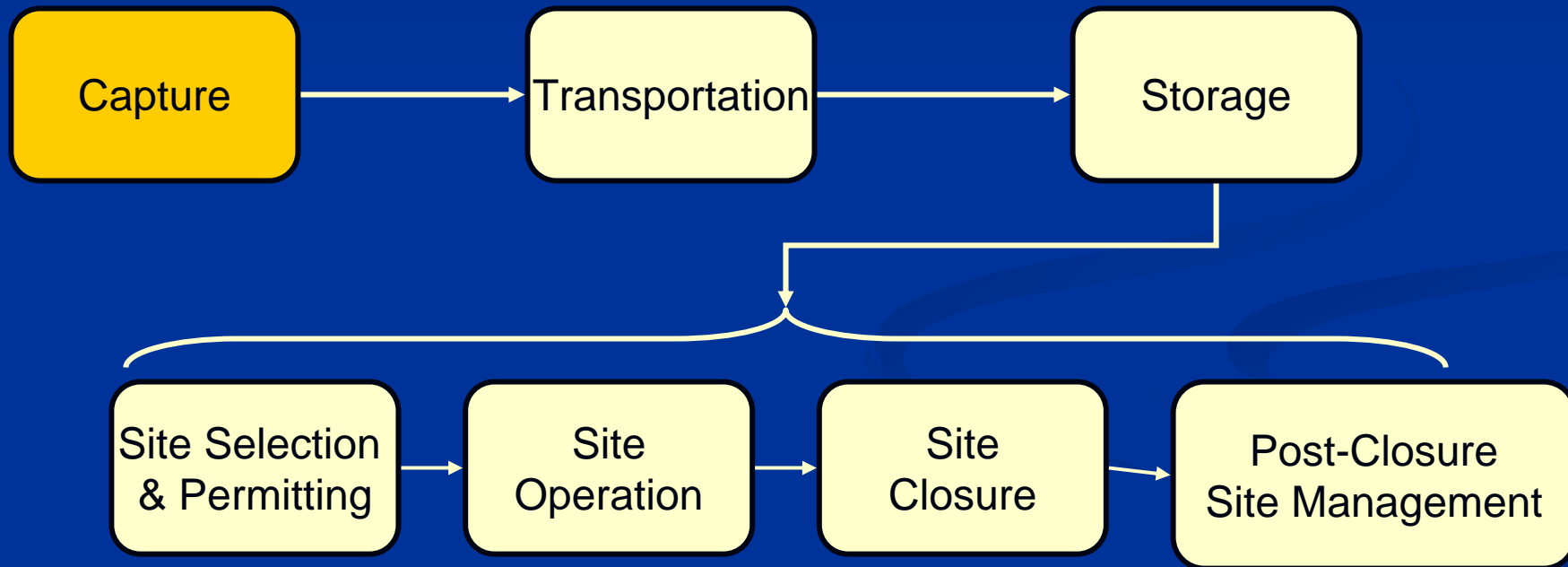
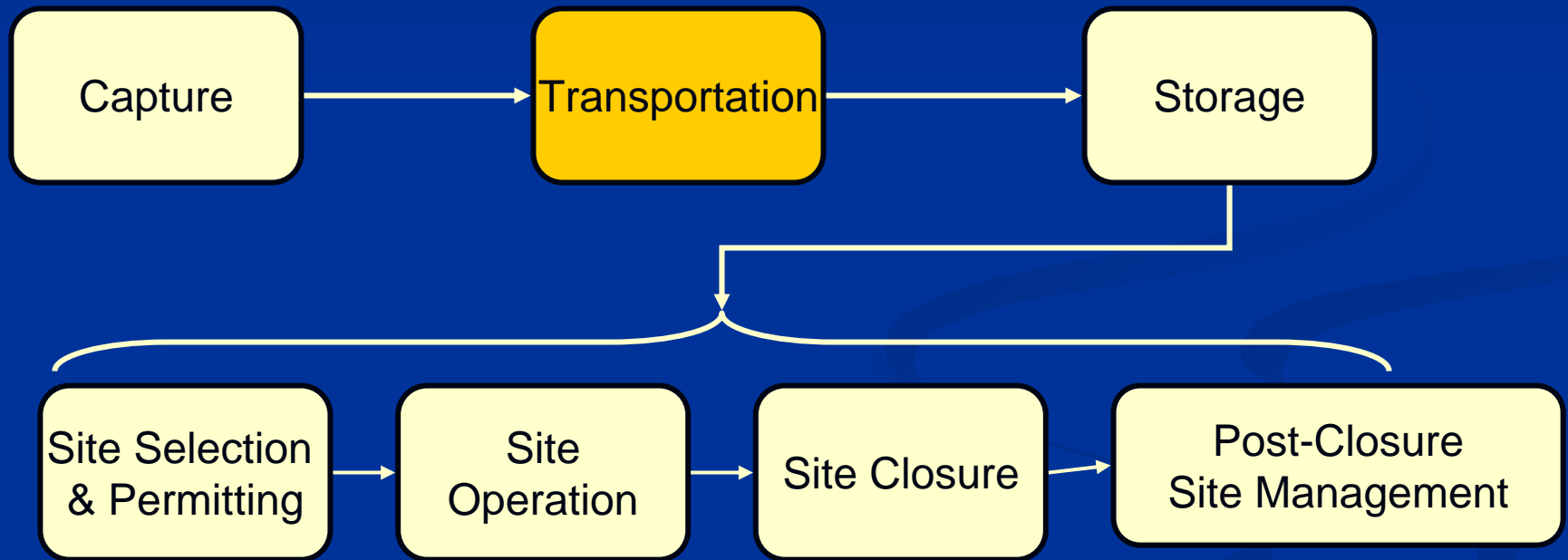


Image courtesy of Dr. Brian J. McPherson, Director, SW Regional Partnership on Carbon Sequestration

# Capture Challenges

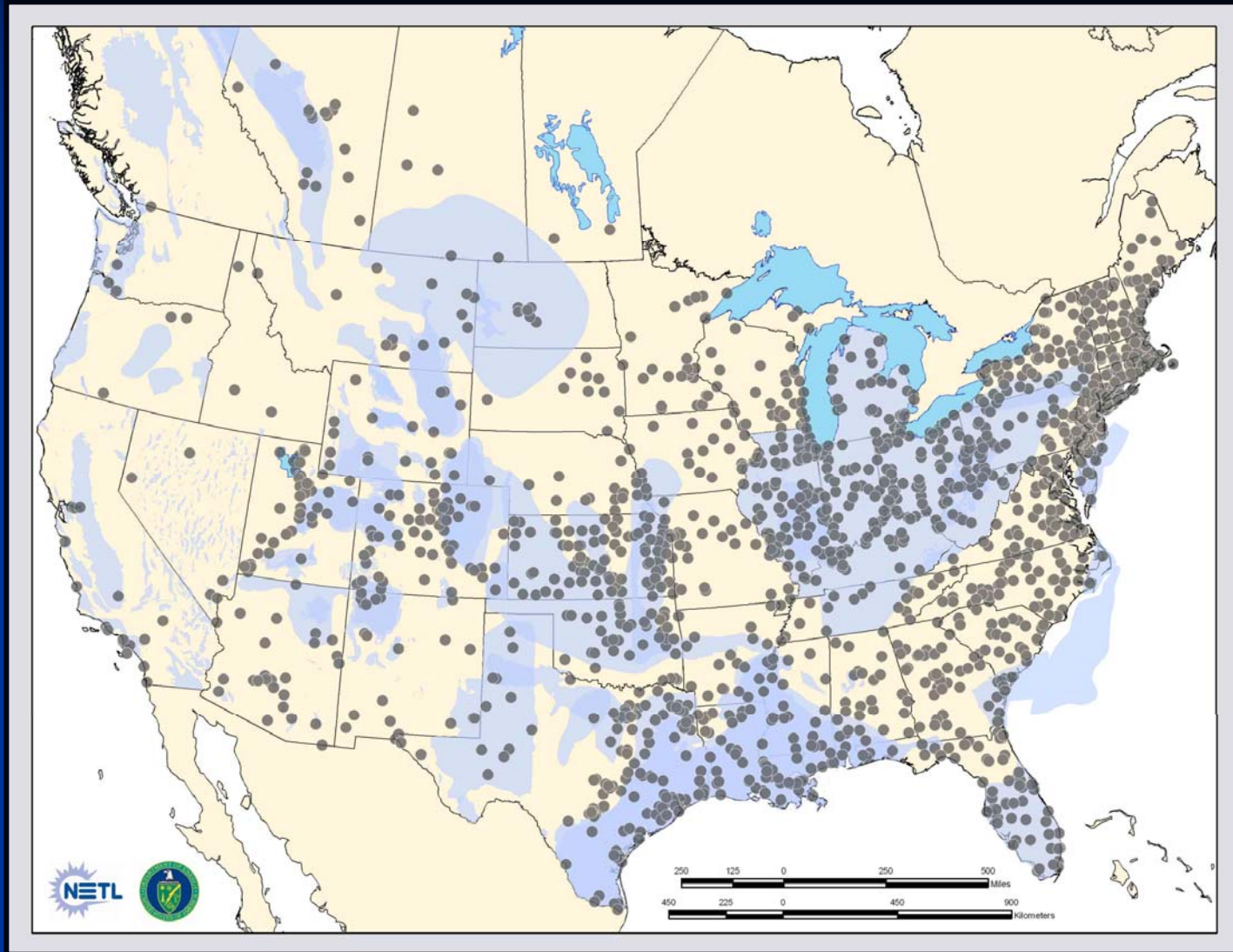


# Transportation Challenges





# CO<sub>2</sub> Sources & Storage Areas



*Image courtesy of Tim Carr, Natcarb Principal Investigator, DOE - NETL*



# CO<sub>2</sub> Infrastructure

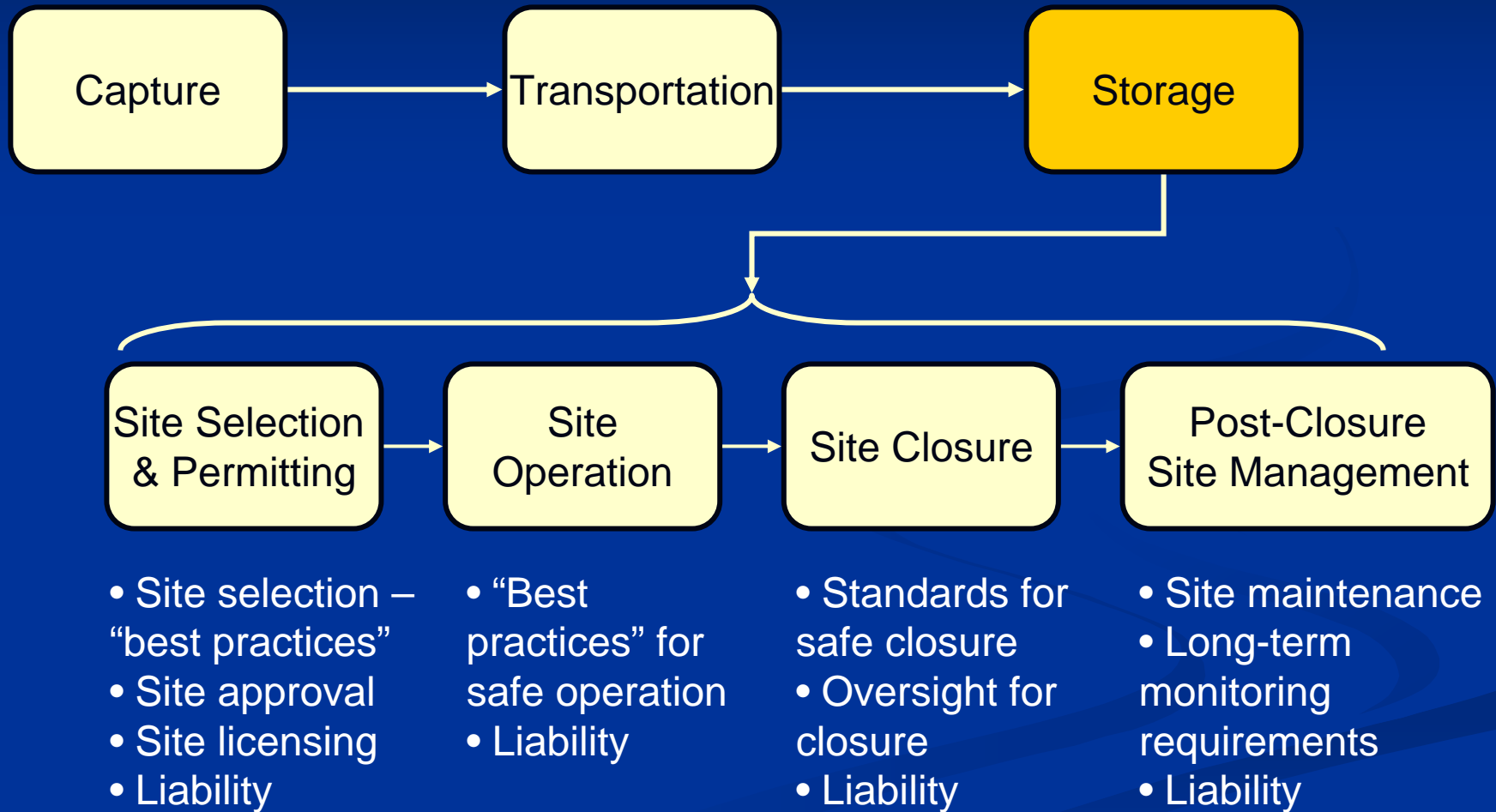


Image courtesy of Tim Carr, Natcarb Principal Investigator, DOE - NETL

# CO<sub>2</sub> Pipeline Oversight

- Three models for CO<sub>2</sub> pipeline oversight
  - Current regulatory framework
  - Oil pipeline model
  - Gas pipeline model

# Storage Challenges





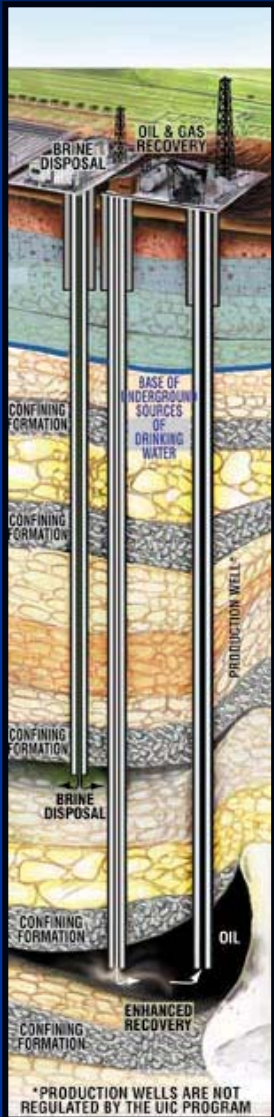


# Site Operation



- How can we ensure safe injection of CO<sub>2</sub> underground?
- What will be required to monitor the location and movement of injected CO<sub>2</sub>?
- How do operators ensure that CO<sub>2</sub> stays underground?

# Site Closure

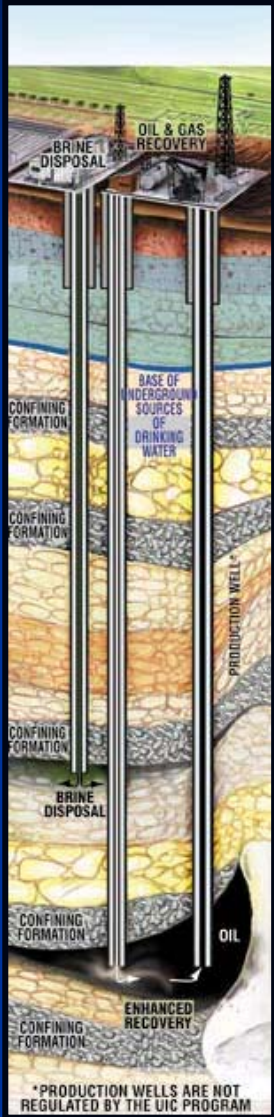


- What is required from an operator to move confidently into the post-closure phase?
- What are the best methods for verifying that a site is closed safely with all CO<sub>2</sub> in permanent storage?
- Who will enforce the closure requirements?





# Liability



- Who manages the site immediately after closure?
- How should subsurface trespass be handled?
- Who will finance remediation of the site if a leak should occur?

# The Way Forward

- A rigorous carbon emissions reduction scheme is needed to ensure that carbon capture occurs.
- The proper financial incentives are needed to assist in carbon dioxide transportation infrastructure development.
- A comprehensive policy & regulatory framework needs to be developed to ensure safe, long-term geologic CO<sub>2</sub> storage.