Reconciling Offshore Permitting in Light of Commercial, Regulatory, and Research Considerations

Prepared for:
US DOE-NETL's Annual Carbon Management Research Project Review Meeting
Pittsburgh, PA

Presented by:
Michael L. Godec, Vice President
Advanced Resources International, Inc.
Arlington, VA USA

August 17, 2022
SECARB Offshore Partnership - Overview

- Establishing the knowledge base required for secure, long-term, large-scale, subseafloor storage of CO₂ with or without enhanced hydrocarbon recovery

- SECARB: ARI, Aker Solutions, Battelle, CRI, Geological Survey of Alabama, IOM Law, LSU, OSU, SAS, Schlumberger, SSEB, Storegga, and Virginia Tech

Division of the SECARB Offshore and GoMCarb study areas. Figure courtesy of Advanced Resources International and modified by SSEB.
Planned SECARB Offshore Research Outcomes

- Integrating data to characterize offshore CO\textsubscript{2} storage resources resulting in decision system to identify high-quality, potentially commercial “prospects.”

- Development of concept for commercially viable CO\textsubscript{2}-EOR and a saline storage prospects, perhaps using subsea completions/separation/compression; with or without utilization of existing infrastructure.

- Refinement/adaptation of simulation tools, geologic models, risk assessment/mitigation strategies for site-specific assessments in the offshore.

- Development of “best practices” based on understanding of the offshore storage prospect(s) targeted

- Reduce uncertainties/risks, better understand MVA approaches

- Address regulatory gaps in the oversight and regulation of CO\textsubscript{2} storage activities (with and without EOR) in the offshore GOM.
Regulation of CO₂ Injection Offshore Evolving Rapidly

• CO₂ injection and CO₂-EOR offshore will be different from the experience of CO₂ flooding onshore.

• BOEM/BSSE and states like Louisiana and Texas are considering how to regulate offshore projects
  – Characterized by fewer wells, larger well spacing and higher injection rates per well.
  – Using regulatory frameworks primarily developed for onshore operations, at least at the state level

  ▪ The primary Class VI objective of groundwater protection is not a driver in the offshore.
    – Impacts on the seabed and the water column will take precedent.

  ▪ Cost considerations are of even greater consequence in the offshore.
Class VI Well Construction Standards in Offshore Settings

- Offshore and directional wells may present greater technical challenges than onshore vertical wells.
- Requirements need to be adapted to offshore, high pressure, high temperature settings, primarily associated with directional wells.
- Concerns with injection well operating requirements need to be more consistent with offshore operations.
- Cost considerations can be a critical inhibitor.
Bayou Bend CCS – Schematic Development Concept

Joint Venture of Talos, Carbonvert, and Chevron
SECARB Offshore Outreach Activities

- Providing SME to regulators and identifying areas of multi-state and multi-agency collaboration
  - Coordinating meetings to discuss technical aspects of Class VI permitting (e.g., well design)

- Hosted May 16 Regulator Workshop
  - AL, AR, and MS interested in primacy (consolidating authority)
  - Lots of industry interest in LA and TX
  - BOEM and BSEE developing regulations as required by the bipartisan infrastructure law

Participation in the 2022 Gulf Region Regulator Workshop
Key Industry Themes - SECARB Offshore/GoMCarb Regulator Workshop - May 2022

- Policy and regulatory uncertainty is perhaps the biggest obstacle impacting large scale CCS deployment offshore
  - Incentives may need to be different, expanded given high costs
  - Offshore regulatory frameworks are still under development

- The capital costs for entry are high; with misunderstanding of the risks and rewards, particularly for private capital providers not familiar with CCS and/or offshore projects.
  - High returns necessary to overcome uncertainty
  - ESG investors are still willing to pursue such opportunities
  - Not clear how critical long-term liability considerations play

- Greater certainty on all fronts critical to establishing potential commercial viability.
Some Issues/Considerations that Research Can Inform

- Unique characteristics of offshore settings (porosity, permeability, size, etc.) and its impacts on pore space utilization and plume management.
- How monitoring programs envisioned for Class VI permitting can be adapted to the offshore environment, when groundwater protection is not the primary focus.
- Trade-offs between repurposing existing infrastructure (pipelines, platforms, wells, fields) or building anew.
- The initial projects are likely to have more rigorous requirements than later projects, as knowledge is gained by both operators and regulators.
  - Can the results from R&D accelerate accumulation of experience?