

Transcending Boundaries

New Energy Ventures Benefit Southern States – Leadership in the South

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SSEB's Existing Carbon Management Program

2021 Bi-Partisan Infrastructure Law and 2022 Inflation Reduction Act

State Activities, Legislation

SSEB's Industry and Stakeholder Engagement

New and Planned Projects



CCS – SSEB Timeline



Southeast Regional Carbon Sequestration Partnership. Evaluated storage potential and source-sink matching in the region and **identified field test locations**.



2003 - 2005

Integrated CCUS at coal-fueled power plant. Technologies transferred to 250 MW Petra Nova facility. MVA technologies evaluated and **over 5 million tons of CO₂ stored**.



SECARB Phase III

2007 - 2020



SECARB-USA

- One of four DOE Regional Initiatives tasked with identifying and removing barriers to the commercial deployment of CCUS
- Evaluated regional infrastructure buildout scenarios, subsurface data density, etc.
- Identify data gaps and risks in the region – well drilling in AL and GA
- Currently drilling a well in VA
- Evaluate commercialization scenarios, continue to engage with industry





CarbonSAFE - Project ECO₂S Phase III (MS)

- Identify a storage complex capable of storing 50 million metric tons over 30 years
- Estimated storage capacity of almost 1 billion metric tons (P₅₀) – world class
- Three new characterization wells drilled and 92 linear miles of 2D seismic acquired
- Submitted EPA UIC Class VI permit





Direct Air Capture of CO₂ (Wilsonville, Alabama)

- Decreasing CO₂ capture costs through testing in integrated field units that produce a concentrated CO₂ stream of at least 95% purity
- Completed engineering and design of test skid
- Test skid has been constructed, transported, and commissioned
- Testing is currently underway and will continue through 2023

DAC RECO₂UP Stakeholder Network

BP, Clean Air Task Force, Carbon Utilization Research Council, Georgia Tech Agricultural Technology Research Institute, Good People Brewing, Marathon Petroleum, Pilgrim's Pride, Shell, Southern Company Services, TVA, University of Georgia College of Engineering, VCCER at Virginia Polytechnic Institute and State University



Schematic illustration of direct air capture (DAC) technology value chain.



DAC system at the National Carbon Capture Center in Alabama.



SECARB Offshore Partnership: Gulf of Mexico

- CO₂ storage and Enhanced Recovery Assessment for eastern GOM, including the analysis of existing and required legal and regulatory frameworks in anticipation of commercial deployment
- Assess CO₂ storage opportunities, evaluate infrastructure options, and identify risks associated with legacy infrastructure and geology
- Actively engaged with state regulators from Alabama, Arkansas, Louisiana, Texas and federal regulators at EPA and BOEM



Gulf Planning Areas and the SECARB-Offshore study area.



Example reservoir models for the central Gulf of Mexico. Figures courtesy of LSU.



Fossil Energy and Carbon Management

- Supports DOE-FECM mission of helping the U.S. meet its need for secure, reasonably priced, and environmentally sound fossil energy supplies
- Objective 1: facilitate communication, education, and outreach
- Objective 2: brief regional state policymakers and regulators
 - Stands up Consortium's activities and Roadmap Development
 - Provides for CCUS Facility Design Support to Industry
 - Supports Stakeholder Engagement and Workforce Development
- Objective 3: promote adoption of U.S. technologies abroad







Robust Developments Supporting CCS



RD&D continues to drive down cost of capture

- ✓ FOAK to NOAK commercial demonstration technologies significantly reduces costs
- ✓ Ex. Boundary Dam (SaskPower) and Petra Nova (NRG)



Policy incentives including the Section 45Q tax credit, Bipartisan Infrastructure Law and California Low-Carbon Fuel Standard are driving project development



Deployment risks are being reduced through both Federal and State-level policies and regulatory frameworks (Ex. Class VI UIC/State Primacy, clarification of pore space ownership, liability, new business models)



DOE Fossil Energy and Carbon Management's focus on CCS



New federal/state level agencies are supporting CCS (EPA, BOEM/BSEE, DOI-BLM, DOT-PHMSA, USGS, Treasury, State Department, CEQ



Advances with education and workforce development, retooling oil and gas expertise



Slide courtesy of Dr. Richard Esposito, Southern Company

Bipartisan Infrastructure Law

- Appropriations for CCUS Programs Total of \$12.1 billion
 - CCUS Demonstration Projects \$2.5 billion
 - CCUS Pilot Projects \$937 million
 - CO₂ Storage Validation and Testing \$2.5 billion
 - CO₂ Infrastructure Finance and Innovation \$2.1 billion
 - Class VI Well Permitting \$75 million
 - Front-End Engineering and Design Studies for CO₂ Transport Infrastructure - \$100 million
 - CO₂ Utilization \$310.14 million
 - Regional Direct Air Capture Hubs \$3.5 billion
 - Commercial Direct Air Capture Technology Prize -\$100 million
 - Precommercial Direct Air Capture Prize \$15 million

The INFRASTRUCTURE INVESTMENT and JOBS ACT

Related Legislation

 Section 40314 – Proposed \$8 billion for clean hydrogen hubs and project financing including fossil fuels with carbon management

Department of Interior

- Section 40307 Congressional language on geologic carbon sequestration providing DOI jurisdiction for the outer continental shelf
- Section 40601 Orphan well site plugging, remediation, and restoration: \$4.7 billion

Environmental Protection Agency

 Section 40306 – Support for Class VI UIC permitting and state primacy efforts: \$75 million



Inflation Reduction Act of 2022



1 million metric tons (MMt)/year x \$85/ton x 12 years = >\$1B



IRA Key Points

Effective date: Pushes out commence construction from Jan. 1, 2026, to Jan. 1, 2033.

Qualified facility: Language lowered qualified facility volume definition. An electric generating facility must capture at least 18,500 tons per year.

Direct pay: Provides direct pay for private entities for 5 years. Those entities are then eligible to use transferability. Public entities can elect to receive direct pay for the life of the credit (12 years).

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State Activities

Enabling or Supportive Policies

- Alabama SB 36 Expands gas storage program to include CO2
- Oklahoma SB 1856 Grant program to support CCUS associated with hydrogen production
- West Virginia HB 4491 Mandates the state pursue UIC Class VI primacy
- Arkansas SB 210 Expands gas storage program to include CO2
- Louisiana HR 229 Mandates the timely approval of Class VI primacy



2023 Legislative Digest.



SSEB Industry and Stakeholder Engagement

- Over 200 reported instances of outreach over the last year (2022)
- Initial feasibility studies developed for pulp/paper and cement
- Enabling policies and legislation
- Community outreach events
- Providing expertise to regulators and identifying areas of multi-state and multi-agency collaboration
- Hosting workshops for knowledge sharing

Participation in the 2022 Gulf Region Regulator Workshop



Proposals Submitted and In Development ('22 and '23)

Proposals Selected for Negotiation				
Title	Scope	Overall Budget	Partners	Vendors
Foreman	Green Cement	\$15,181,354	Advanced Resources Intl., Ash Grove Cement, CRI	Air Liquide, Sargent and Lundy, Environmental Resource Management
Longleaf	CO ₂ Storage Hub	\$23,905,597	Advanced Resources Intl., CRI, ENTECH Strategies, Geological Survey of Alabama, University of South Alabama, Tenaska, Williams	Baker Hughes, Loudon Technical Services
Lochridge	Offshore CO ₂ Storage Hub	\$10,575,238	Cox Operating, CRI, LSU, Repsol, Southern University Shreveport	Advanced Resources Intl., KBR, UT Bureau of Economic Geology
OASIS	CO ₂ Storage Hub	\$9,931,147	Advanced Resources Intl., Auburn University, Alabama A&M, CRI, Oklahoma State	Baker Hughes, Loudon Technical Services
Proposals Submitted and Awaiting Decision				
Title	Scope	Overall Budget	Partners	Vendors
SEDAC Hut	Southeast Direc Air Capture Hub	t \$21,000,000	2 DAC technology companies, multiple university partners, field services companies, consulting companies, etc.	Multiple
LIGH ₂ T	Blue and Green Hydrogen Production	\$2,500,000,000	Industrial gas supplier, petrochemical company, large mid- stream company, among others	Multiple
Proposals Submitted where SSEB is a Participant				
Title	Scope	Overall Budget	Partners	Vendors
DAC HUB	Technology Development for DAC Hub	-\$3,000,000	4 DAC technology companies, multiple university and research partners	Multiple
SEH ₂ Hub	Green Hydroger Production	\$2,000,000,000	Multiple electric utilities and university partners	Multiple

Note: Overall budgets for proposals that have been submitted are provided in round numbers only.



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Summary of Proposal Funds

- Over \$63 million in new funding in negotiation
- Doubles the size of SSEB's existing carbon management program
- At least 11 of the Board's member states receiving federal dollars in selected proposals – all states included when expanded to pending
- SSEB supporting numerous funding opportunities throughout 2023
- Currently expecting to submit three additional proposals in Fall of 2023



