

# **Clean Energy: Fueling Growth & Prosperity in the South**

## MISSION STATEMENT

Through innovations in energy and environmental policies, programs, and technologies, the **Southern States Energy Board** enhances economic development and the quality of life in the South.



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# CHAIRMAN'S MESSAGE



*Gov. Henry McMaster  
South Carolina*

It is an honor to serve as the Chairman of the Southern States Energy Board for 2021-2022. This outstanding organization has been a vital catalyst for energy and economic growth in the South during its 62 years in existence. The governors and state legislative leaders who forged this interstate compact in 1960 could not have known that the organization over time would become “the voice of the South to the Administration and Congress on energy and environmental issues.”

This year, I chose, “Clean Energy: Fueling Growth and Prosperity in the South” as our theme. I believe our South Carolina story is typical of our other Southern States. Our economy is booming. More and more people are visiting our state – with many deciding to stay for good. Employers are creating new jobs, entrepreneurs are opening new businesses, and companies are deciding to relocate here. Our business and family-friendly environment has produced historic gains in new jobs, capital investment and population growth.

Also, we are working hard to promote energy innovation. We are making strategic investments in technology, protections against cyber and physical threats, and clean and renewable energy. Our Southern States together boast an eight trillion-dollar economy and utilize more than half of the nation’s energy resources to fuel our industrial production and business development. The unprecedented transition that is underway in the energy sector only adds to the infrastructure challenges which stand before us.

Emerging out of the COVID-19 pandemic of the past two years, our Southern States have led the nation in a resurgence that has expanded job opportunities and economic expectations. South Carolina exemplifies this growth trend as an “all of the above” energy resource State in terms of fuels and uses. We are the third largest producer of nuclear power in the nation. Over the past decade, South Carolina has shifted from the use of coal to natural gas. Although coal still accounts for nearly 13 percent, the use of natural gas has more than doubled, providing about 24 percent of our energy, with nuclear providing 55 percent.

Renewable energy resources also have an exciting future here. Hydropower, solar energy, and biomass now combine to account for 8 percent of electricity generation. We have 122 active solar farms and 33 wind energy manufacturing facilities. Our port facilities in Charleston, Mount Pleasant, and North Charleston provide a U.S. gateway for the global wind energy market, as South Carolina is considered to have the second largest offshore wind resources on the East Coast.

Further, our electricity rates remain low-cost to the consumer, below the national average, making the “Palmetto State” a growing attraction for business and industry. We rank among the “Top 10” states in residential sector per capita electricity sales. Our major industries include motor vehicle manufacturing, chemicals, and paper production, which together account for one-third of the State’s total energy consumption.

So, as you can see, South Carolina’s energy story is a good one. And like those of all of our Southern States, it is going to get even better.

This year all of us have seen a major emphasis at federal and state levels focused on energy issues and the environment. These efforts are directed toward an energy transition that accelerates the use of “clean energy,” renewables, decarbonization, carbon capture and storage, grid modernization, emissions mitigation, and a re-emphasis of the transportation sector centered around electric vehicles. On behalf of its member jurisdictions, the Southern States Energy Board has been in the midst of these developments both in the state legislatures and in Washington, D.C., working with Congress and federal agencies.

Our Southern States have strong environmental track records, highly efficient and well-controlled power plants, and we have benefited from consistent improvements in ambient air quality as a result. In our region, ozone levels continue to drop, and electric power is playing an even smaller role with respect to mobile and point source air pollution emissions. Ten of our member states have submitted revised state implementation plans to the U.S. Environmental Protection Agency (EPA) in good faith governing the interstate transport of emissions under the 2015 Ozone National Ambient Air Quality Standard enshrined in the Clean Air Act. Four regional transmission organizations (ERCOT, MISO, PJM, and SPP) have submitted written comments to EPA expressing concerns that the new and



pending Regional Transport Rule Federal Implementation Plan will prematurely close critical baseload power plants with no replacement power in place by 2026. This forced retirement of natural gas and coal plants throughout the South will affect reliability, resiliency, and the sustainability of electric power across the region. A measure of “cooperative federalism” is needed here to address these concerns and resolve them early.

An emphasis of the Southern States Energy Board for more than the past two decades has been “Carbon Management.” During its meeting in 2000, members of the Board determined that carbon emissions were an increasing problem in the region and across the nation. They voted to add carbon management to the list of long-term issues that needed to be addressed by the Board and brought to the attention of the federal government. Soon thereafter, President George W. Bush’s Administration proposed a “Clear Skies Initiative” to reduce greenhouse gases which was quickly followed in 2003 by the creation of the international Carbon Sequestration Leadership Forum and Regional Carbon Sequestration Partnerships proposed through the Office of Fossil Energy at the U.S. Department of Energy.

The Southern States Energy Board was chosen to manage the Southeast Regional Carbon Sequestration Partnership (SECARB) focusing initially on carbon dioxide removal from the atmosphere. Southern States Energy Board geologists and partners characterized promising locations in the Southern region, finding many suitable geologic formations for the permanent storage of carbon dioxide emissions. Owing to historical oil and gas exploration, initial efforts identified spectacular carbon dioxide storage potential in the Gulf region of the South. This work continues, with much of the effort focused on characterizing areas with limited existing information to determine suitability for carbon dioxide storage. With a better understanding of the region’s geology, The Southern States Energy Board is assisting governments and industries in finding feasible locations for commercial carbon capture and storage technology deployment in the region.

Small carbon dioxide capture and storage field tests followed the Board’s early successes with the characterization of sources and sinks, proving that carbon dioxide could be managed and stored in deep geologic formations safely and securely. In an ultimate “early test,” the SECARB Partnership injected over 11 million metric tons of carbon dioxide into an oil field in Cranfield, Mississippi. This enormous achievement was followed by another when the SECARB Partnership built the world’s first integrated carbon capture, transportation, injection and storage facility at Plant Barry in Bucks, Alabama, in 2013, demonstrating the viability of carbon capture and storage. The plans for this unit were then utilized by NRG Energy to scale up and construct a commercial sized plant near Houston, Texas.

Ongoing activities in the Board’s SECARB-USA Regional Partnership Initiative include the evaluation of subsurface data density so that our states can better understand their respective carbon dioxide storage potential and identify potential risks to commercial carbon dioxide storage operations. As part of this, the Board and its partners have been drilling stratigraphic test wells in Alabama and Georgia near large volume emitting facilities with promising results for carbon dioxide removal. This will enable states and industry to work together, further de-risking industry investments in carbon capture and storage.

On May 16, 2022, the Board hosted a highly successful, major workshop in New Orleans, providing an opportunity for subject matter experts to meet with state and federal environmental regulators to identify key areas of multi-state and multi-agency collaboration. Regulators from Alabama, Arkansas, Louisiana, Mississippi, and Texas attended to discuss well drilling and design and other aspects of EPA Class VI permitting requirements. In addition to this, the Southern States Energy Board and its many partners have managed over 180 inquiries and instances of knowledge sharing with industries interested in incorporating carbon dioxide capture and storage into their broader decarbonization strategies. As part of this, initial feasibility studies have been developed at the request of the cement and pulp and paper industries. The Southern States Energy Board’s staff expertise and experience have made the organization a premiere knowledge source for industry partners.

The Southern States Energy Board’s CCS Commercialization Consortium, formed with academic partner, The University of Houston, and its Center for Carbon Management in Energy in 2020, is engaging leading industries across the nation to minimize the challenges associated with CCS Commercialization and provide solutions. Currently, more than 50 major domestic and international

companies and industries in the fields of oil, natural gas, chemicals, transportation, cement, pulp and paper, research engineering, academic research, geologic storage, CCS drilling and design, and technical project innovation, are members. The Consortium supports the mission of the U.S. Department of Energy to minimize the environmental impacts of fossil fuels while working toward net-zero emissions. In its first year, the Consortium members developed a Roadmap containing the full chain of CCS activities. These include carbon capture, transportation, storage, utilization, policy and regulatory capacities, environmental justice and stakeholder engagement, workforce development, risk reduction, long-term liability, insurance, and financial investment markets. The strategic focus in this second year is on environmental justice and stakeholder



engagement; policy, legal and regulatory matters; and commercialization enablers such as risk management, liability, and financial markets.

The Board is also working on developing a technology that can capture carbon dioxide directly from the air. This technology, commonly referred to as direct air capture (DAC), removes many of the spatial limitations of existing technologies and opens the possibility of capturing carbon dioxide anywhere in the world. In a cooperative agreement with the U.S. Department of Energy, the Southern States Energy Board is leading a public/private partnership with companies and utilities across the nation to build a direct air capture unit that can capture carbon dioxide from utilities or industrial emitters. The test unit will be constructed during the fall and winter months of 2022 for demonstration and testing at the National Carbon Capture Center in Wilsonville, Alabama, in 2023.

As part of its ongoing federally funded Project ECO<sub>2</sub>S, the Southern States Energy Board and its 19 partners have collaborated with site host Mississippi Power Company and drilled six new characterization wells and acquired 92 linear miles of 2D seismic data in Kemper County, Mississippi. Here the goal is to identify and characterize a carbon dioxide storage complex capable of storing 50 million metric tons of carbon dioxide over a 30-year period. Reservoir models indicate that the subsurface of eastern Mississippi represents a world class prospect with an estimated storage capacity of almost one billion metric tons of carbon dioxide.

Rounding out the Board's Carbon Management Program is the SECARB Offshore Partnership. The Southern States Energy Board and its partners are focused on evaluating the potential for carbon dioxide storage in the Eastern Gulf of Mexico. The project includes an analysis of existing and required legal and regulatory frameworks in anticipation of commercial deployment. The Board and its partners are assessing storage location opportunities, and identifying risks associated with legacy infrastructure, geology, business case models, and regulations to assist industry. Active participation includes state regulators from Alabama, Louisiana, Mississippi, and Texas.

In the third year of a five-year project, our Transuranic Waste Transportation Working Group is comprised of state officials named by their governors who coordinate the interstate transport of TRU waste to the Waste Isolation Pilot Plant in Carlsbad, New Mexico. This project also enables the Southern States Energy Board to provide direct funding to states to support staff who monitor these shipments, engage in emergency response planning and first responder training. The funds provided by the Southern States Energy Board allow corridor states to purchase special equipment, and communication devices unique to this field.

Our Radioactive Materials Transportation Committee meets twice annually with officials from the U.S. Department of Energy to stay abreast of nuclear waste shipments in various categories and special developments requiring state assistance in transit. State officials are funded through the



Southern States Energy Board, participate in technical training, and learn from experts regarding the treatment of waste materials, and other nuclear issues such as casks for nuclear spent fuel, interim storage, consent-based siting, and new, small modular reactors that may be deployed in the future.

Paramount to the Board's success is the valuable contribution that we receive each year from our industry Associate Members. Many participate as technical advisers and consultants on the Southern States Energy Board projects and work with staff to add their expertise on critical energy or environmental topics of interest. Our Associate Members provide us with the ultimate public/private partnership and for this I am most grateful.

The Southern States Energy Board remains a cutting edge, policy and technology organization providing an experienced technical staff of innovators and experts who are constantly at work for member states and territories. Current programs and projects of the Board bring in almost one-half billion dollars to the states in our Southern region. I commend this 62nd Annual Report of the Board to all members and interested parties, signifying a proud tradition of leadership that has continued to evolve over many decades!



His Excellency Henry McMaster  
Governor of South Carolina  
Chairman



# PROJECTS

## DIGITAL OUTREACH

As the effects of the COVID-19 pandemic receded over the past year, we devoted more time to orchestrating our in-person meetings rather than webinars. However, we did host three webinars.

In January of 2022, SSEB hosted two webinars related to carbon capture, utilization, and storage (CCUS) technology and regulation. One covered the open-source tool *SimCCS*, which provides novel capabilities for decision support and design of integrated carbon capture, utilization, and storage technologies. *SimCCS* has supported numerous studies on the benefits and costs of large-scale CCUS deployment.

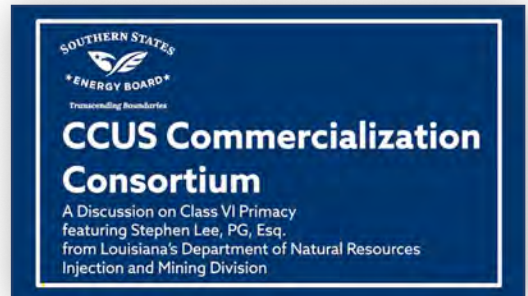
The other, hosted by our CCUS Commercialization Consortium, covered the topic of Class VI Primacy with a specific focus on Louisiana's efforts in attaining such.

In March, we hosted *The Future of Critical Minerals & Rare Earth Elements in the Southeast*. In it, we answered how the Southeast is responding to critical mineral and rare earth element demand and what the future holds for the growing need for such materials. With your mobile device's camera app, scan the codes under each image to view the webinars.

We also live-streamed our joint meeting between SECARB Offshore and GoMCarb, which is available upon request.

Alongside our webinars, SSEB continues to strengthen its social media reach as well. Our visibility expands across Youtube, LinkedIn, Twitter, Facebook, and Instagram.

Despite fewer webinars than the year prior, our average views on Youtube increased by 50 percent and the average time users spent watching a video increased by 30 percent.



Visitors to our LinkedIn page averaged up a colossal 1,500 percent over the past year while Twitter engagement remained flat.

Engagement on Facebook trended down while engagement on Instagram trended up by an equal amount, which mirrors industry trends of users moving away from Facebook in favor of Instagram and competitors like TikTok.

In part due to an effort to increase our visibility on search engines with SEO optimization, our website's year-over-year unique visitors and page views increased from 7,000 users and 20,000 page views to more than 12,000 users and 40,000 page views. We continue to explore ways in which to enrich our website's utility including the inclusion of an Interactive Energy & Environment Legislative Digest this year, which is discussed further under our Energy and Environmental Legislative Monitoring program on page 24.

## EDUCATING AND ENGAGING STAKEHOLDERS

Southern States Energy Board prioritizes outreach and education through a variety of venues including keynote presentations, panel discussions, conferences and workshops, exhibits, and myriad activities meant to engage public officials and other stakeholders. SSEB strives to enhance and improve understanding and awareness of domestic energy development, energy and environmental policies, and clean energy technologies and their importance in the region.

On July 9, 2022, SSEB hosted the 2022 Joint Annual Briefing to Southern Legislative Leaders and Committee on Carbon Management Meeting. In preparation for the meeting, SSEB published its 2022 Preliminary Energy and Environment Legislative Digest, a compendium of legislation passed by the Board's 18 member states and territories. The meeting included presentations by Board Members and Associate Members as well as an overview of legislative trends in the region. Speakers included:

- Dr. Jay Hakes, Former Administrator, U.S. Energy Information Administration;
- The Honorable William Sandifer, South Carolina House of Representatives and Treasurer, Southern States Energy Board;
- The Honorable Jim Powell, Federal Representative, Southern States Energy Board;
- Joe Giove, Director of Business Operations, Office of Carbon Management - U.S. Department of Energy;
- The Honorable Charles McConnell, University of Houston Center for Carbon Management in Energy
- Michael Nasi, Special Counsel, Southern States Energy Board; and
- Kenneth Nemeth, Secretary and Executive Director, Southern States Energy Board.

In coordination with the University of Houston's Center for Carbon Management in Energy, SSEB is leading a carbon capture, utilization, and storage (CCUS) Leadership Team. Consisting of 54 companies and organizations, this unique public-private consortium promotes the rapid and transformative deployment of CCUS technologies. To this end, SSEB and the University of Houston worked closely with subject matter experts to develop a CCUS roadmap that has been initiated to achieve actionable tasks that will reduce risks and uncertainties across the CCUS value chain and incentivize and encourage industry investment.

Examples of significant engagements from the past year are provided below and represent a mix of in-person and virtual events establishing our communications and outreach efforts as robust and wide-ranging:

SSEB Briefings to Board Members | Host and Presenters

SSEB Annual Energy Briefing to Southern Legislative Leaders | Host and Presenters

SSEB Associate Member Meetings | Host and Presenter

Southern Legislative Conference Annual Meeting | Participant

State Energy Offices, Briefings on SSEB Programs and Activities | Presenters

SECARB Offshore GOM Partnership (Joint Meeting with The University of Texas at Austin, Bureau of Economic Geology) Stakeholder Briefing | Co-host and Presenters

Direct Air Capture Recovery of Energy for CCUS Partnership Annual Review Meeting | Presenters

SECARB-USA Project Meetings | Host and Presenters

Project ECO<sub>2</sub>S Phase III Team Meetings for Risk Assessment Workshops and Annual Review Meeting | Host and Presenters

National Energy Technology Laboratory's 2022 Integrated Project Review Meeting | Presenters and Participants

CCUS Commercialization Accelerator Consortium Leadership Team Meetings | Host and Presenters

Midland CO<sub>2</sub> Conference | Presenter

Western Interstate Energy Board High-Level Radioactive Waste Committee and WIPP Technical Advisory Group Meeting | Presenter

Council of State Governments Northeast High-Level Radioactive Waste Transportation Task Force | Presenter

Council of State Governments Midwestern Office Radioactive Materials Transportation Committee Meeting | Presenter

Transportation Emergency Preparedness Program Ad Hoc Working Group | Chairman

Tribal Radioactive Materials Transportation Committee Meeting | Presenter

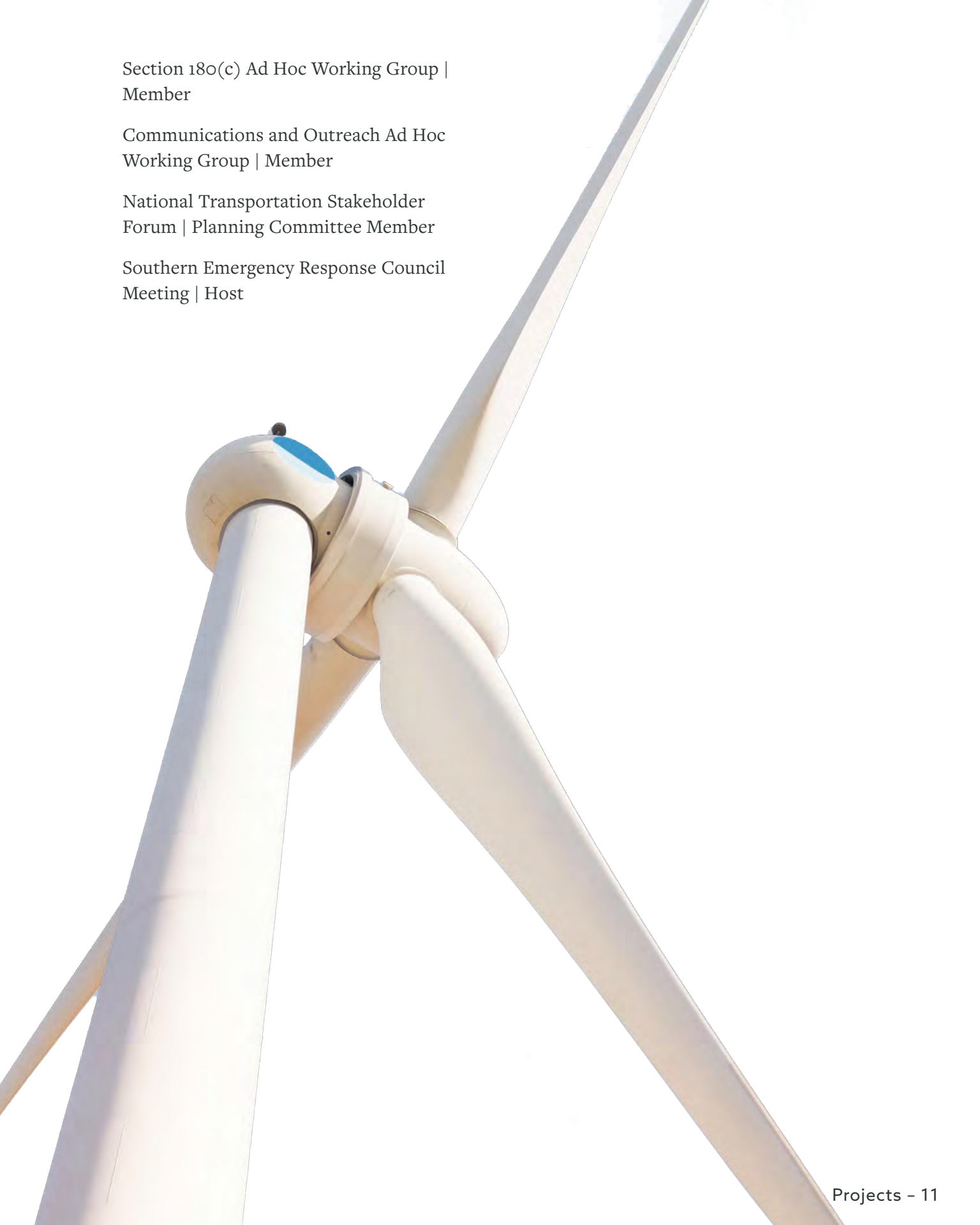
Spent Nuclear Fuel Rail/Routing Ad Hoc Working Group | Member

Section 180(c) Ad Hoc Working Group |  
Member

Communications and Outreach Ad Hoc  
Working Group | Member

National Transportation Stakeholder  
Forum | Planning Committee Member

Southern Emergency Response Council  
Meeting | Host



# PROGRAMS

## DIRECT AIR CAPTURE RECOVERY OF ENERGY FOR CCUS PARTNERSHIP (DAC RECO<sub>2</sub>UP)

In early 2021, SSEB launched a project known as the Direct Air Capture Recovery of Energy for CCUS Partnership (DAC RECO<sub>2</sub>UP). The project employs a team approach and supports the Department of Energy's Office of Fossil Energy and Carbon Management's goal to decrease the cost of carbon capture through the testing of existing direct air capture (DAC) materials in integrated field units that produce a concentrated carbon dioxide (CO<sub>2</sub>) stream of at least 95 percent purity. Solid-amine CO<sub>2</sub> adsorption-desorption contactor technology, proven in the laboratory, will undergo high-fidelity design/validation.



In addition, many commercial facilities have low-concentration CO<sub>2</sub> vents that are uneconomical to treat alone but could provide more efficient mass and thermal transport to DAC systems with integrated energy recovery and flexible CO<sub>2</sub> treatment capabilities.

Technology scale up will leverage past research and occur in a commercially-relevant environment at the National Carbon Capture Center. Pre-screening techno-economic analysis, risk assessments, and life cycle analysis will be performed by experienced team members. Results of the project will address critical technical barriers that, when solved, will improve the capital and operating costs of DAC while validating commercial relevance of cost and product quality/need.

Team members for the project include:

- AirCapture LLC;
- Global Thermostat;
- Synapse Product Development;
- Crescent Resource Innovation;
- National Carbon Capture Center; and
- Southern Company.

The project is currently in its Construction Phase, which is set to end in October of 2022. From there, the project will enter its final phase, Integrated Systems Testing, scheduled to conclude in January of 2024.

# SOUTHEAST REGIONAL CARBON STORAGE PARTNERSHIP: OFFSHORE GULF OF MEXICO (SECARB: OFFSHORE)

With over 290 CO<sub>2</sub>-emitting point sources within 60 miles of the Alabama, Georgia, Louisiana, and Mississippi coast, the State and Federal waters of the Gulf of Mexico (GOM) may provide a unique opportunity to permanently store the CO<sub>2</sub> emissions from the region's many industries. SSEB is facilitating offshore geologic storage of CO<sub>2</sub> in the GOM through the creation of government-industry partnership(s) that are focused on assembling the knowledge base required for secure, long-term, large-scale CO<sub>2</sub> storage. The following organizations contribute their expertise to the project: Advanced Resources International, Battelle Memorial Institute, Crescent Resource Innovation, Geological Survey of Alabama, Louisiana State University, Oklahoma State University, Virginia Polytechnic Institute and State University, the Energy Institute of Alabama, Interstate oil and Gas Compact Commission, the Mississippi Energy Institute, and SAS.



Building on previous activities, the project team has continued to evaluate storage opportunities in the offshore environment, ascertain reservoir properties that most influence CO<sub>2</sub>, and examine the legal and regulatory requirements for offshore commercial CO<sub>2</sub> storage operations. Although CO<sub>2</sub> storage capacity estimates continue to evolve as information becomes available, recent calculations suggest that the study area is capable of storing hundreds of years of annual U.S. CO<sub>2</sub> emissions. In addition, the project team has utilized existing seismic and stratigraphic well data to construct 3D models of prospective storage reservoirs representative of the offshore environment to better understand the dynamics of CO<sub>2</sub> storage in the subsurface and associated risks. Finally, the project team has developed an accounting of risks associated with commercial projects. Broadly, commercial risks are divided into six primary categories and include (1) subsurface risks; (2) regulatory risks;

*The Offshore team gathers for a group photo at its joint meeting with GoMCarb in New Orleans.*



(3) infrastructure risks; (4) monitoring, verification, and accounting risks; (5) commercialization risks; and (6) public relations risks.

On May 16, 2022, the project team hosted a Gulf Region Regulator Workshop in collaboration with the University of Texas at Austin’s Bureau of Economic Geology in New Orleans, Louisiana. The workshop was designed to facilitate communication between the region’s many regulators who will ultimately be tasked with overseeing commercial CCUS projects. Participants included state regulators from the Alabama Oil and Gas Board, the Arkansas Oil and Gas Commission, the Louisiana Department of Natural Resources, the Mississippi Oil and Gas Board, the Texas General Land Office, the Texas Railroad Commission, as well as federal regulators from the Bureau of Ocean Energy Management, the Bureau of Safety and Environmental Enforcement, EPA Region 4, and EPA Region 6. The workshop also included industry perspectives from Chevron, Cox Operating, and the Louisiana Mid-Continent Oil and Gas Association.

Moving forward, the project team will continue to assess the information required for commercial CCUS operations in the offshore environment. This will include the continued evaluation of CO<sub>2</sub> storage opportunities, an accounting of risks to commercial projects, and an assessment of relevant legal and regulatory considerations. The project team will also continue to engage regularly with stakeholders including the region’s many regulators and industries.

## ESTABLISHING AN EARLY CO<sub>2</sub> STORAGE COMPLEX IN KEMPER COUNTY, MS (ECO<sub>2</sub>S)



The “Establishing an Early CO<sub>2</sub> Storage Complex in Kemper County, Mississippi: Project ECO<sub>2</sub>S” Phase III project builds on the Phase II results that successfully demonstrated that the subsurface adjacent to the Kemper County Energy Facility has the potential to store commercial volumes of CO<sub>2</sub> safely, permanently, and economically within a regionally significant saline reservoir system. The Phase III program has the primary goal of completing the site characterization in support of a Class VI Underground Injection Control (UIC) permit to construct. To meet this goal, the Partners have completed regional characterization and detailed injection site characterization necessary to support the UIC permit, including:

1. The drilling of characterization/monitoring wells;
2. The acquisition of seismic data for reservoir and structural characterization purposes; and
3. The assessment/baseline monitoring of underground sources of drinking water (USDWs).



In parallel, pre-feasibility studies for CO<sub>2</sub> capture from a variety of CO<sub>2</sub> sources are nearing completion to identify capture technologies as well as potential CO<sub>2</sub> capture volumes, achievable CO<sub>2</sub> purity, and delivery pressures. Tying it all together and feeding back into the UIC Class VI Permit application, injection simulation studies are carried out to define the project's potential Area of Review (AoR) for the development scenario.

Accomplishments to date:

- Drilled three characterization wells during Phase II and an additional three during Phase III;
- Identification and characterization of three storage reservoirs (Massive Sand/Dantzler, Washita-Fredericksburg, and Paluxy);
- 92-mile 2D seismic survey completed July 25, 2021;
- USDW characterization well completed July 26, 2021;
- Class VI UIC permit applications in preparation;
- NEPA Environmental Information Volume submitted to NETL on July 13, 2021;
- Initial Phase III Risk Registry prepared within 45 days of award prior to the commencement of the well drilling activities and a second assessment in the summer of 2022;
- Preliminary modeling of potential transport options; and
- CO<sub>2</sub> capture assessments underway at Plant Miller (coal) and Plant Ratcliffe (natural gas).
  - For the third source, Plant Daniel, a separately funded FEED study is underway (FE0031847).

## SOUTHEAST REGIONAL CO<sub>2</sub> UTILIZATION AND STORAGE ACCELERATION PARTNERSHIP (SECARB-USA)

The Southern States Energy board is leading a coalition of technical experts to identify and

The logo for SECARB-USA features the word "SECARB-USA" in a bold, sans-serif font. "SECARB" is in red and "USA" is in blue, with a white outline for the letters.

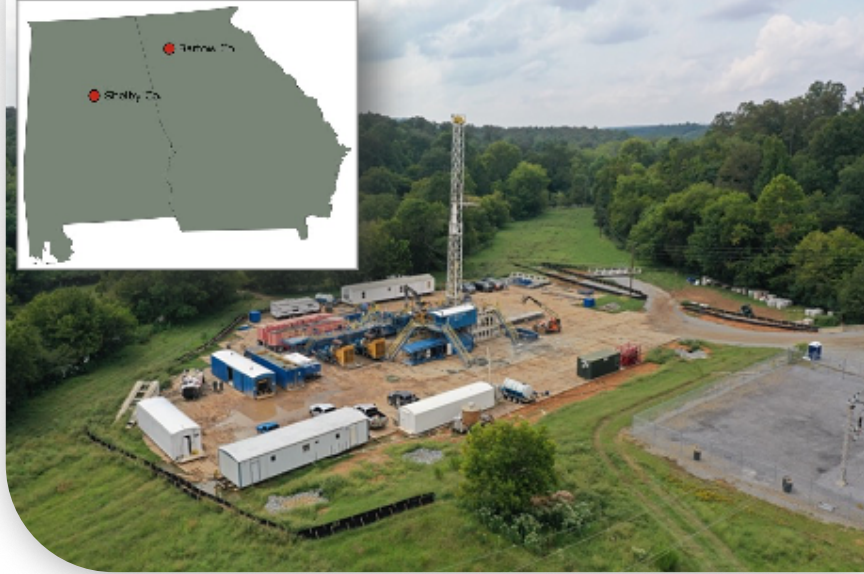
address regional onshore storage and transportation challenges facing commercial deployment of CO<sub>2</sub> capture, utilization, and storage technologies (CCUS). The project team includes experts from Advanced Resources International, Auburn University, the University of Texas at Austin's Bureau of Economic Geology, Crescent Resource Innovation, the Environmental Defense Fund, Geological Survey of Alabama, Los Alamos National Laboratory, Oklahoma State University, SAS, and the Virginia Center for Coal and Energy Research. Industry participants include The Clean Air Task Force, Denbury Resources, Inc., Marathon Petroleum Corporation, Mitsubishi Heavy Industries of America, Inc., SAS Institute, Inc., Southern Company, and the Tennessee Valley Authority.

The project is funded by the U.S. Department of Energy (DOE) and encompasses the States of Alabama, Arkansas, Florida, Georgia, Louisiana, Mississippi, North Carolina, South Carolina, Tennessee, Virginia and portions of Kentucky, Missouri, Oklahoma, Texas, and West Virginia.

As part of a regional study, the project team has evaluated the availability of data required to advance a prospective storage site toward EPA UIC Class VI readiness. As part of this evaluation, the project team identified areas requiring further data collection to determine suitability for CO<sub>2</sub> storage. To this end, SSEB partnered with Southern Company, its subsidiaries, and Advanced Resources International to drill two stratigraphic test wells in the Valley and Ridge province of Georgia and Alabama where limited data currently exists. Information from these field activities will be used to examine commercial CCUS opportunities in north-central Alabama and northwestern Georgia. In addition to generating new subsurface data, the project team has examined the region to identify hot spots for CCUS deployment and assessed infrastructure needs to connect CO<sub>2</sub> sources to storage reservoirs. Further, the project team has developed cost estimates associated with project development. In general, these efforts are designed to assist developers in evaluating project merits and opportunities to minimize impacts on communities.

As part of a broader effort to engage with stakeholders, the project team participated in 186 separate knowledge sharing and outreach engagements over the past year (Q2 2021 through Q2 2022). These included conversations with the region's many industries, regulators, and policy makers to name a few. Topics included general CCUS, project design support, data needs assessment, and existing state and federal legislation. Broadly speaking, the project team has become a recognized source of information for those interested in learning more about CCUS.

Moving forward, the project team will continue to assess data within the region and evaluate opportunities to collect new data and inform future projects. Further, the project team will continue to engage regularly with industry and a broader group of stakeholders to support the broad deployment of CCS and increase public awareness of these technologies. As part of this, the project team will utilize existing data tools (e.g., EPA's EJScreen Tool) to identify environmental justice



*Aerial photograph of the Cassville stratigraphic test well located in Bartow County, GA. Image courtesy of Dr. Randy Kath (University of West Georgia). Inset shows the approximate locations of the Cassville stratigraphic test well in Georgia and the Westover stratigraphic test well in Alabama.*

communities in the region that may be impacted by future CCS development scenarios and inform project strategies. Finally, the project team will develop an engagement plan to involve the region's Tribal Nations in ongoing and future conversations related to CCS.

## SUSTAINING A REGIONAL EFFORT TO SUPPORT CARBON MANAGEMENT POLICIES AND TECHNOLOGIES

This project supports and enhances the U.S. Department of Energy's (DOE) mission of minimizing the environmental impacts of fossil fuels while working toward net-zero emissions. The Southern States Energy Board manages this effort that fosters and sustains an innovative and collaborative environment for the development of policies and technologies related to CO<sub>2</sub> capture, utilization, and storage, clean hydrogen (H<sub>2</sub>) production from fossil sources and biomass, infrastructure buildout scenarios for transporting and CO<sub>2</sub> and H<sub>2</sub>, critical minerals development, CO<sub>2</sub> removal approaches and carbon conversion, and societal considerations and impacts. Broadly, project objectives include (1) foster and facilitate communications, education, and outreach, (2) support regional outreach efforts focused on briefing state policymakers and regulators on the historical and current technical aspects of clean energy demonstration programs, and (3) promote the adoption of U.S. technologies abroad.

The program supports the Southern States Energy Board's Carbon Management Committee, composed of federal, state, and private sector members, to serve as a regional resource to DOE-FECM for the development of carbon management and CO<sub>2</sub> reduction technologies and policies. The Committee convenes annually to seek opportunities and expand knowledge of CCUS and related carbon management matters. The 2022 committee meeting was held in conjunction with the Board's Annual Energy Briefing to Southern Legislative Leaders on July 9 in Oklahoma City, Oklahoma.

The committee is focused on the utilization of advanced and transformative fossil energy power systems and their role in creating economic growth with environmental stewardship domestically and internationally. Further, the committee identifies and analyzes issues impacting the domestic and international commercial deployment of CCS/CCUS technologies with emphasis on public policy issues and technologies. Fossil energy and carbon management industry issues, interests and needed policies are communicated to appropriate federal, state and private industry officials, including Southern States Energy Board members.

In coordination with the University of Houston's Center for Carbon Management in Energy, SSEB has established a CCUS Commercialization Consortium. Consisting of over 50 companies and organizations, this unique public-private consortium will promote the rapid and transformative deployment of CCUS technologies. To this end, SSEB and the University of Houston worked closely

with the Consortium Membership to develop a CCUS Commercialization Roadmap designed to enumerate the challenges most critical to the broad commercialization of these technologies. This was accomplished through polling of the Consortium Membership and by hosting a series of meetings to discuss the challenges facing industry. In general, it was determined that the major challenges facing industry can be divided into three categories and include (1) stakeholder outreach and environmental justice; (2) legal and regulatory considerations; and (3) commercialization enablers – risk reduction and financial markets. Following the creation of the Roadmap, the Consortium established working groups to further evaluate the challenges included in each of the three categories and identify areas where subject matter experts might work together to affect change necessary for broad CCUS commercialization.

The Commercialization Consortium is also intended to serve as a forum for knowledge sharing to discuss the successes and challenges of commercial CCUS endeavors. To this end, the Consortium has held two in-person meetings in Houston, Texas. Notably, on July 28, 2022, the Consortium hosted the newly appointed U.S. Department of Energy Assistant Secretary for Fossil Energy and Carbon Management, Brad Crabtree, and his staff. The meeting was hosted in collaboration with the Greater Houston Partnership and the Global CCS Institute and was attended by over 120 individuals and included representatives from major oil and gas companies, mid-stream operators, environmental NGOs, and trade organizations. The meeting included a keynote address from Secretary Crabtree, an overview of each of the three hosting organizations, and a robust Q&A session. Moving forward, the Consortium will continue to work closely with its industry partners to create an environment supportive of broad commercialization of CCUS.



CCUS Commercialization Consortium Members

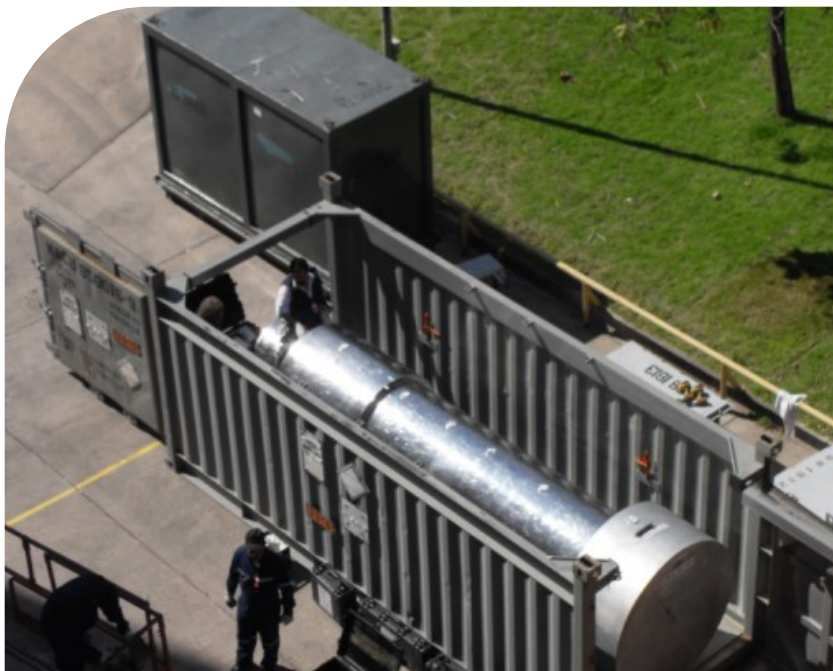
# FOREIGN RESEARCH REACTOR SPENT NUCLEAR FUEL SHIPMENTS

SSEB is approaching three decades of nuclear non-proliferation efforts in association with DOE's National Nuclear Security Administration's Office of Material Management and Minimization (M3). The program works globally to prevent state and non-state actors from developing nuclear weapons or acquiring weapons-usable radiological materials. M3 utilizes a three-pronged approach of convert, remove and dispose to accomplish its mission. SSEB, through its committee structure, has successfully assisted M3 with planning and conducting shipping campaigns (1996-to present) under which the U.S. has eliminated over 7,225 kilograms of weapons-usable nuclear materials from 48 countries. During the life of the program, most of the shipments have entered the U.S. via the southern region (Naval Support Activity Charleston) before being transported by rail to the Savannah River Site in Aiken, South Carolina or cross-county by truck to the Idaho National Laboratory.

The program has not only consisted of maritime movements hailing from overseas, but also involves highway transport from Canada. SRS was chosen as the disposition facility for the nuclear inventory from the Chalk River facility in Ontario which consisted of (3) shipping programs: Target Residue Material (TRM), National Research Experimental (NRX) and National Research Universal (NRU). TRM is a highly enriched liquid form and required unique handling and packaging requirements. The NRX/NRU movements were spent fuel from the two research reactors. Together, these campaigns used to produce medical isotopes covered more than 200,000 miles of safe transport since they began in 2015. The NRX/NRU program consisted of 56 shipments and concluded in 2019 and the TRM movement involved 115 shipments and was completed in 2020. The 1,200-mile shipment route traversed several states in the region en route to SRS and therefore radiological transportation training was provided to first responder organizations to prepare for response to an accident.

*Spent fuel transportation cask loading operations are shown below.*

Due to the efficiency and success of the project, the Canadian portion of the program has ended and the overall number of shipments from abroad have been drastically reduced. Nevertheless, changing world dynamics always yield the potential for future shipments and thus SSEB continues to maintain educational outreach efforts and foster engagement with its stakeholders.

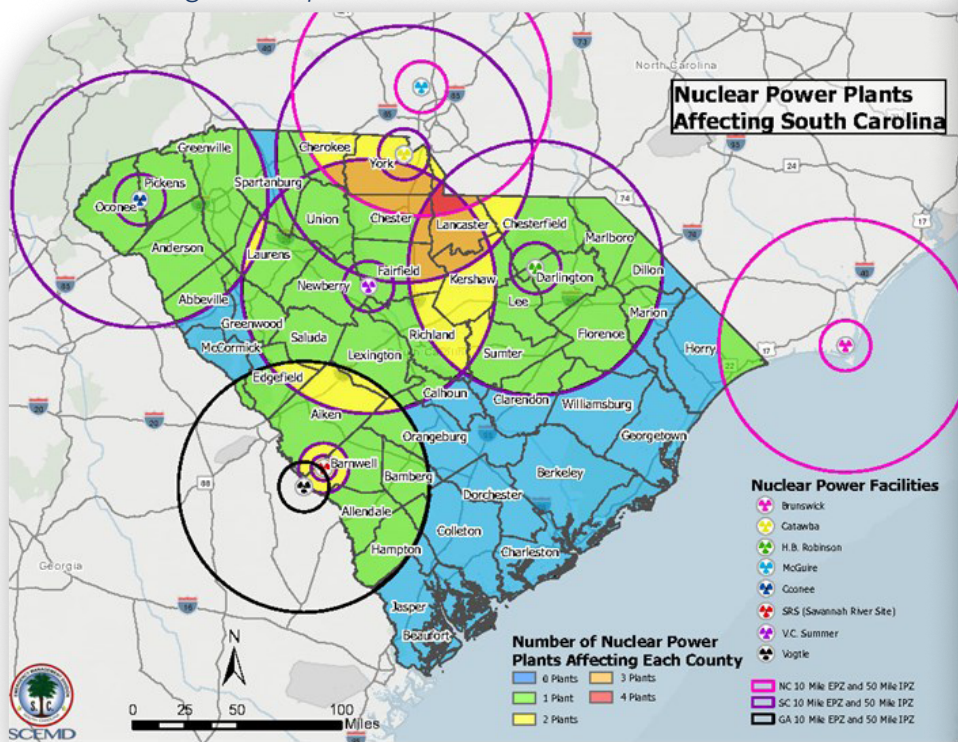


# SOUTHERN EMERGENCY RESPONSE COUNCIL (SERC)

The Southern Emergency Response Council (SERC) is responsible for the administration of a mutual aid agreement, formalized in 1972, to support one another in the case of a radiological incident involving a nuclear power plant. SERC’s authority is documented in the Southern Mutual Radiation Assistance Plan (SMRAP) which illustrates how protocols would be implemented in the case of such an emergency. Created as a blueprint for coordinating radiological emergency assistance capabilities among participating states in the southern region, SERC representatives review, revise, and administer SMRAP on an annual basis to reflect changes in state emergency response capabilities and equipment. The 14 signatory states which currently comprise SERC are as follows: Alabama, Arkansas, Florida, Georgia, Kentucky, Louisiana, Mississippi, Missouri, North Carolina, Oklahoma, South Carolina, Tennessee, Texas, and Virginia.

To maintain preparedness for SERC members, the Southern States Energy Board acts as regional coordinator to simulate the activation of the SMRAP during state nuclear power plant exercises. Since the beginning of the year, three states (Alabama, Georgia and North Carolina) have incorporated SSEB into their Federal Emergency Management Agency evaluated drills and have made contact to request personnel, equipment, vehicles, and subject matter expertise from their border states. The drills adhere to the Nuclear Regulatory Commission’s established emergency classifications. The emergency classifications increase in severity from Notification of Unusual Event; Alert; Site Area Emergency; and General Emergency. A SERC meeting is held once per year in conjunction with the Organization of Agreement States meeting. This gathering allows members the opportunity to discuss matters related to SMRAP. The most recent meeting of the group was held in August 2022, in Fort Worth, Texas, to ratify the latest version of SMRAP. During the meeting, a discussion was held on the use and incorporation of innovative technologies into the listing of resources identified in the plan.

*Illustration of the South Carolina Nuclear Power Plant Emergency Planning Zone Map.*



## RADIOACTIVE MATERIALS TRANSPORTATION

Developing an integrated waste management system to transport, store and dispose of the United States spent nuclear fuel (SNF) and high-level radioactive waste continues to be the primary focus of SSEB's Radioactive Materials Transportation Committee. The Committee's partnership with DOE-NE's Office of Integrated Waste Management has been highly active in 2022 and has yielded productive outcomes in many areas.

In March, a Radiation Specialist Course was held in Burlington, Kentucky for a select few advanced skill-level state and regional hazardous materials team members. The course, which received rave reviews and was conducted by DOE's Transportation Emergency Preparedness Program (DOE-TEPP), included the use of high activity "live" radiation sources. Students were encouraged to bring their jurisdiction's radiological survey instrumentation thereby gaining experience with their use in a field of radiation. Thanks to funding support from DOE-NE, SSEB was able to provide reimbursement for other (out-of-state) qualified personnel within the region to attend.

*SSEB Committee Members tour Holtec Manufacturing Facility in Camden, New Jersey.*

Soon after the conclusion of the Kentucky course, SSEB began collaborating with DOE-TEPP to host an additional

Radiation Specialist Course during the latter part of July in Baton Rouge, Louisiana. In addition, preliminary planning has begun for yet

another course in early December to be held in Nashville, Tennessee. SSEB realizes the value of attending such specialized training courses and has therefore made it a priority in order to enhance the level of preparedness within the region for the transportation of radioactive materials.

June was also an eventful month with the resumption of the in-person National Transportation Stakeholders Forum. The annual gathering focuses on the Department's remediation efforts and national planning strategies for the safe transport of radioactive materials. SSEB's Radioactive Materials Transportation Committee had great attendance at the



Forum which was held in Philadelphia and provided representation in the Department's Ad Hoc Working Groups. One Working Group offers the opportunity to explore operational contingencies for future rail shipments of spent nuclear fuel. Another Group will provide input to the DOE-NE on developing messaging, strategies, and products to communicate effectively with Tribes, States, the general public, and other stakeholders on SNF transportation and management activities and issues. There were also groups pertaining to training and developing a funding mechanism for Tribes and States to support a major transportation campaign.

Finally, the Committee stands ready to aid DOE-NE as it resumes work on consent-based siting. The primary goal is to find sites to store and dispose of spent nuclear fuel using an approach based on equity, broad participation and community well-being.

## TRANSURANIC WASTE TRANSPORTATION

SSEB's Transuranic (TRU) Waste Transportation Working Group works closely with the U.S. Department of Energy's Carlsbad Field Office (DOE-CBFO) to develop policy and implement protocols necessary to safely transport shipments of TRU waste from the southern region (Savannah River Site and Oak Ridge National Laboratory) to the Waste Isolation Pilot Plant (WIPP) in Carlsbad, New Mexico.

Thus far, the Working Group has had a busy first half of the year. The reduction of COVID cases and the easing of travel restrictions has returned the transportation schedule, emergency response activities and overall operations to a sense of normalcy. The Board began 2022 by hosting a series of virtual meetings with their WIPP corridor state subgrantees. The discussions, although primarily financial, served as great opportunities to formalize regional planning (WIPPTREX exercises, equipment purchases, training, outreach efforts, etc.) as the WIPP shipments ramped back up to pre-COVID levels.

TRU waste, which is generated from the production of nuclear weapons, mainly consists of solid items such as protective clothing and gloves, rags, lab instruments and equipment, as well as other items that have become contaminated by transuranic isotopes. Annually, SSEB provides a total of \$2 million amongst the corridor states via a cooperative agreement negotiated on their behalf with DOE-CBFO. The funding is used by the states for the aforementioned planning items as well as other preparedness activities in accordance with the objectives of the national program. Since opening in 1999, the WIPP facility has processed over 13,000 shipments. Southern sites are rapidly approaching 2,000 of those shipments (ORNL - 247 / SRS - 1,694) and represent 2.87 million miles of highway transport.





*SSEB's Southern Corridor WIPP Roadshow is shown above.*

June was also an eventful month with the hosting of the Southern WIPP Corridor Road Show. The DOE Carlsbad Field Office, in conjunction with the SSEB, held a road show along the Interstate 20 WIPP transportation route. The road show was conducted during the fourth week of June and made stops in the states of Texas, Louisiana, Mississippi, Alabama, Georgia and South Carolina. The road show highlighted the primary shipping package for TRU waste - the TRUPACT-II, WIPP transportation protocols and requirements, driver standards, package design and testing requirements, inspection procedures, emergency response plans and equipment and security enhancements. Those attending had the opportunity to speak with representatives from WIPP and the drivers about all aspects of the project.

Lastly, the TRU Working Group received an update on DOE-CBFO's procured land and facilities near the Carlsbad Field Office which the Group coined WIPP University. The property continues to be developed into a training site for the WIPP program to include classroom courses and hands-on field exercises such as modified or full versions of a WIPPTREX. The site will also be a great resource for first responder training, TRANSCOM Training, and workshops for WIPP state program managers and financial personnel regarding grants and cooperative agreements. Groups who visit WIPP University could also tour the WIPP site as a part of their regimen. WIPP University is tentatively scheduled to open before the end of the calendar year.

## ENERGY AND ENVIRONMENTAL LEGISLATIVE MONITORING

Every year, our legislative monitoring program collects and summarizes bills and resolutions in all of the Board's member states and territories to produce the Energy and Environment Legislative Digest— available on our website and in print.

This year, we debuted our Interactive Legislative Digest. On our website, you can now review an updated index of bills as they pass in our member states and beyond. Bills are divided into categories and organized using maps to provide a quick reference as to the actions of our member states across related topics. Due to the nature of legislative reporting from Puerto Rico and the U.S. Virgin Islands, they each have their own pages of passed bills.

Over this year's legislative sessions, 265 energy-related bills and 275 environmental acts were passed by our member states and territories. Several legislative trends emerged in our member states. In the energy realm, hydrogen, nuclear, and renewable power measures saw a surge. As with previous years, flood mitigation, environmental remediation, and emergency planning and response were key environmental legislative trends.

Nationwide, we observed an influx of bills supporting the development of hydrogen production. Our members in Alabama, Florida, Maryland, Oklahoma, and Tennessee all passed laws related to hydrogen storage, development, or related technologies.

The southeast region also passed the highest number of nuclear-related bills in the last decade ushered by a renewed interest in nuclear energy development and deployment that has swept over the Southeast and many other states around the nation. Louisiana, Mississippi, Tennessee, Virginia, and West Virginia all enacted legislation either governing or encouraging nuclear energy development.

With decarbonization goals driving energy technology development, many states addressed the capture and storage of carbon dioxide. Alabama, Louisiana, Mississippi, Oklahoma, Tennessee, and West Virginia all passed such laws.

As electric vehicle (EV) adoption continues to grow, we've seen many legislative measures addressing EV infrastructure deployment and taxation surrounding their use, and this year was no different. Kentucky, Louisiana, Maryland, Mississippi, South Carolina, Virginia, and West Virginia all passed laws affecting EV fees and infrastructure development.

We also observed many trends continuing from last year in the solid waste category, including the regulation of catalytic converter recycling and advanced recycling definitions and rules. Alabama, Kentucky, Louisiana, South Carolina, Virginia, and West Virginia passed measures on such matters.

A focus on deadly pollutants such as lead also found its way into the halls of many legislatures. Alabama, Georgia, Maryland, and Virginia all passed legislation addressing lead exposure mitigation.

In response to the Russian war against Ukraine, many states passed laws banning Russian oil and petroleum imports and adopted related resolutions urging Congress to fill the gap by strengthening our domestic production. Louisiana, Missouri, Mississippi, North Carolina, Tennessee, and West Virginia all passed laws related to such prohibitions or calls for strengthened domestic energy security.

Finally, legislatures across our region passed a bevy of laws regarding solar and wind energy development and deployment. Florida, Louisiana, Maryland, Puerto Rico, South Carolina, Tennessee, and Virginia all passed measures regulating or encouraging the growth of solar and wind generation.

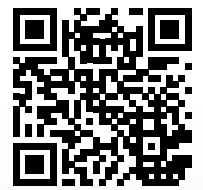
The latest version of the printed Digest is current as of August 15, 2022. The interactive Digest will receive continuous updates as bills are adopted within our membership region.



**Energy & Environment  
Legislative Digest**  
2022



*Scan the code above  
to view the Interactive  
Digest.*



*Scan the code above  
to view the static  
Digest.*

# PARTNERSHIPS

## OUR PARTNERS

The Southern States Energy Board has myriad collaborative efforts underway and through these robust partnerships with government, business, industry, and academia, our member states and territories benefit from the work of energy and environmental experts throughout the country.

## ASSOCIATE MEMBERS PROGRAM

The SSEB Associate Members program was founded in 1981 by Kentucky Governor John Y. Brown during his chairmanship. The members represent both regional and national energy providers, resource companies, educational institutions, and technology developers. The Associate Members act in an advisory capacity to the Board. With increasing interest from the region's prominent energy industries and organizations, SSEB gains a broad depth of knowledge and diverse perspectives on the impact of energy and environmental policies and regulations on the region's economy.

### 2021-2022 Officers



*Chair*  
**Danny Gray**  
*Green Cement Inc.*



*Vice Chair*  
**John Eick**  
*American Fuel &  
Petrochemical  
Manufacturers*



*Immediate Past Chair*  
**Jennifer Jura**  
*Edison Electric  
Institute*

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Ameren Missouri

American Chemistry Council

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Manufacturers

American Gas Association

American Petroleum Institute

America's Power	ME2C Environmental
Anterix	Michael Karmis, Ph.D., P.E., LLC
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BP	National Rural Electric Cooperative Association
Bryant Songy Snell Global Partners	Nuclear Energy Institute
Carbon Utilization Research Council	NuScale Power
Chevron U.S.A. Inc.	ONE Gas
Columbia Southern University	Peabody
Dominion Energy	Phillips 66
Duke Energy	SEFA Group
Edison Electric Institute	Shell Oil Company
Energy Fairness	South Carolina Public Service Authority/ Santee Cooper
Energy Institute of Alabama	Southern Company
Energy Policy Network	TC Energy
ExxonMobil	Tennessee Valley Authority
FuelCell Energy	Texas A&M
Green Cement Inc.	Troutman Pepper
Koch Companies Public Sector, LLC	Virginia Center for Coal & Energy Research
Marathon Petroleum Corporation	West Virginia University
Metallurgical Coal Producers Association	

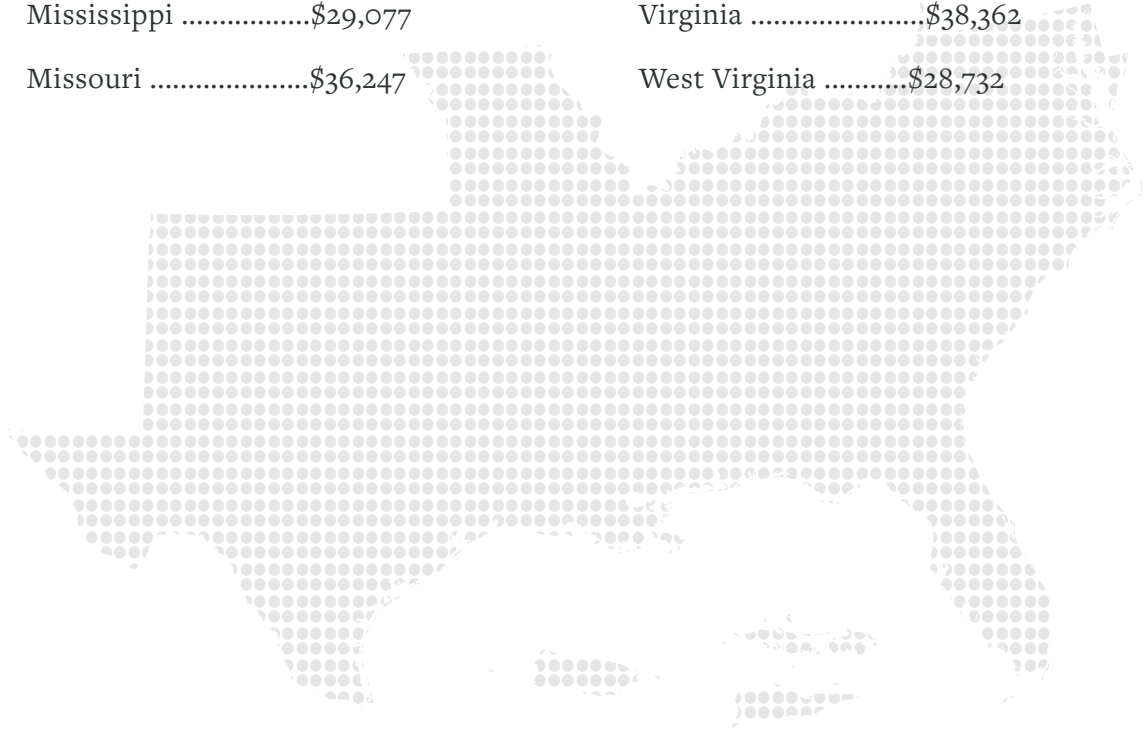
## SOURCES OF SUPPORT

The Southern States Energy Board's primary source of funding is its annual appropriations from the 18 member states and territories. Each member's share is computed by a formula written into the original compact. This formula is composed of an equal share, per capita income, and population. The Board has not requested an increase in annual appropriations since 1987. The compact authorizes the Board to accept funds from any state, federal agency, interstate agency, institution, person, firm, or corporation provided those funds are used for the Board's purposes and functions. This year, additional support was received for research projects from cooperative agreements from the United States Department of Energy and Department of Defense.

Additionally, SSEB continues to lead an Associate Members program composed of industry partners who provide an annual contribution to the Board. Membership includes organizations from the nongovernmental sector, corporations, trade associations, and public advocacy groups. The Associate Members program provides an opportunity for public officials and industry representatives to exchange ideas, define objectives, and advance energy and environmental planning to improve and enhance the South’s economic and environmental well-being.

In addition, the SSEB carbon management program’s industry associates and partners provide monetary sponsorships to complement the Board’s CCUS projects and activities and assist with cost share needs on our federal projects. SSEB also receives corporate sponsorships, registration fees, as well as other, in-kind contributions to support the expenses associated with the SSEB annual meeting and other events.

Alabama .....	\$32,572	North Carolina .....	\$37,042
Arkansas .....	\$31,027	Oklahoma .....	\$32,512
Florida .....	\$47,212	Puerto Rico .....	\$25,597
Georgia .....	\$35,782	South Carolina .....	\$31,372
Kentucky .....	\$32,197	Tennessee.....	\$34,267
Louisiana .....	\$33,817	Texas .....	\$55,402
Maryland .....	\$37,192	U.S. Virgin Islands....	\$25,297
Mississippi .....	\$29,077	Virginia .....	\$38,362
Missouri .....	\$36,247	West Virginia .....	\$28,732



# BOARD MEMBERS

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*South Carolina*



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*Member*  
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**Sen. Ken Yager**  
*Tennessee*



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**Jim Powell**



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**Kenneth Nemeth**  
*SSEB*

## Members

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Sen. Clyde Chambliss (Governor's Alternate)

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Sen. Bob Ballinger  
Sen. Gary Stubblefield (Alternate)  
Rep. Rick Beck  
Comm. Ted Thomas (Governor's Alternate)

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Sen. Debbie Mayfield (Alternate)  
Rep. Bobby Payne  
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Sen. Brian Feldman  
Sen. Stephen Hershey (Alternate)  
Dr. Mary Beth Tung (Governor's Alternate)

### Mississippi

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Sen. Joel Carter, Jr.  
Sen. Dennis DeBar, Jr. (Alternate)  
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Christopher Wells  
*Director, Nuclear Programs*

Benjamin Wernette, Ph.D.  
*Principal Scientist and Strategic  
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***Adjunct Staff***

Gerald R. Hill, Ph.D.  
*Senior Technical Advisor*

Michael Nasi  
*Special Counsel*

Eddie Joe Williams  
*Senior Policy Advisor*

## PHOTOS — YEAR IN REVIEW

Did you attend or speak at one of our meetings in the past year? Scan the code below with your phone's camera app to visit our website where you can view and download photos taken at our various meetings and events. You might find yourself or a friend in the pictures!



## BOARD OVERVIEW

The Southern States Energy Board (SSEB) is a non-profit interstate compact organization created in 1960 and established under Public Laws 87-563 and 92-440. The Board's mission is to enhance economic development and the quality of life in the South through innovations in energy and environmental policies, programs, and technologies. Sixteen southern states and two territories comprise the membership of SSEB, and each jurisdiction is represented by the governor and a legislator from the House and Senate. A governor serves as the chair and legislators serve as vice-chair and treasurer. Ex-officio non-voting Board members include a federal representative appointed by the President of the United States, the Southern Legislative Conference Energy and Environment Committee Chair, and SSEB's executive director, who serves as secretary.

SSEB was created by state law and consented to by Congress with a broad mandate to contribute to the economic and community well-being of the southern region. The Board exercises this mandate through the creation of programs in the fields of energy and environmental policy research, development and implementation, science and technology exploration, and related areas of concern. SSEB serves its members directly by providing timely assistance designed to develop effective energy and environmental policies and programs and represents its members before governmental agencies at all levels.



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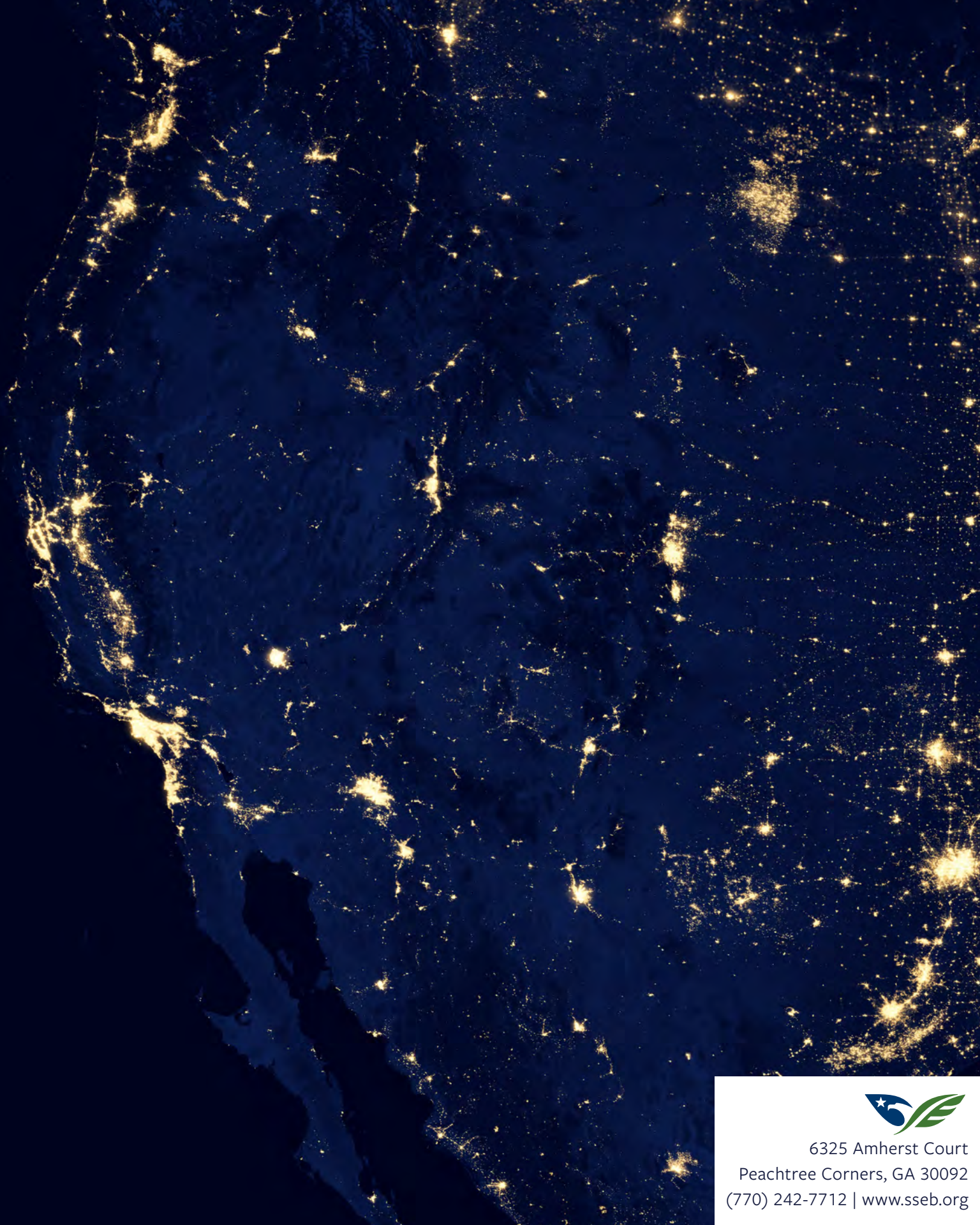
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