



Transcending Boundaries



**LOW
COST
ENERGY**

FOUNDATION OF A
**MANUFACTURING
RENAISSANCE**

**Annual
Report
2019**

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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Message from the Chairman

At several points in the 20th and 21st centuries, America had to learn painful lessons about the need for energy independence. As one example, a barrel of OPEC crude oil cost \$9.96 in 1999, but had soared to \$100 by 2008. In recent decades, high gasoline prices contributed to pressures on small business, an increased cost of goods and services, and manufacturing entities moving offshore partially to offset the cost of energy and to seek regulatory relief and cheap labor. These events led to an economic downturn and a virtually non-existent recovery through 2017.

Through this experience our country learned some grave lessons, one of which is the theme of the Southern States Energy Board's 59th Annual Meeting: **Low Cost Energy is the Foundation of a Manufacturing Renaissance!**

Fortunately for America, during this same time, our oil and gas drilling industries were rediscovering hydraulic fracturing and horizontal drilling. While directional drilling has existed since the 1930s, its combination with hydraulic fracturing has changed the global energy landscape in just the past ten years. Advances in horizontal drilling technology have allowed producers to reach new depths, enabling the cost-effective development of tight oil/gas formations, in what has been called the "Shale Revolution." An all-out push from the President is rekindling America's manufacturing ethos, and offshore businesses are repatriating capital at record levels.



*Gov. Matt Bevin
Chair*

All of the Above

Sound policy influences and facilitates the creation of businesses and markets. That's why reducing burdensome regulation has been a primary focus of our administration in Kentucky and President Trump's administration in Washington. In recent history, excessive federal regulation of the energy industry has placed undue burdens on the affordable, reliable and safe production of energy generated from fossil fuels. Thankfully, that regulatory atmosphere is now changing.

The Southern States Energy Board has consistently called for an "All of the Above" energy policy that enables energy resource companies, utilities and the R&D community to work together to develop optimum technologies while not abandoning our abundant resources and simultaneously protecting the environment.

Through its Annual Legislative Digest, the Board develops, analyzes and recommends legislation and cites legislative trends that support robust management of our energy resources while focusing on energy efficiency and innovative technological development. "States Learning from Each Other" is a recurring theme as well as a regional focus on interstate cooperation.

Regional Action on Emergency Motor Fuels

Recently, the Southern region has seen more than its share of hurricanes and natural disasters. As an example, when hurricanes and natural disasters strike the Southeast or our Gulf Coast states, only on rare occasions is one state affected. Hurricane Harvey in 2017 affected fuel deliveries to 38 states.

For the past year, the SSEB staff has been meeting with state and federal officials regarding the regional issues associated with an "early warning" to states in the path of an imminent natural disaster. Fuel supplies are paramount for evacuees, then first responders, and finally homeowners returning to the area in the aftermath of a weather event. Yet often, emergency fuel waivers are not granted in time at the federal level, or not applied for

by states until it is too late to move emergency fuels safely.

Year after year, lives are lost with attendant financial consequences. Just over the past 15 years, the loss of human capital and financial impacts have devastated the southern states. In 2005, the National Oceanic and Atmospheric Administration (NOAA) determined that Hurricane Katrina was directly responsible for over 1200 deaths: 1000 in Louisiana, 200 in Mississippi, 7 in Florida and \$161.3 billion in financial losses directly attributed to this weather event.

In 2017, our region endured the loss of 107 people to Hurricane Harvey: 134 deaths were attributed to Hurricane Irma, and Maria was responsible for 3059 total deaths with 2975 fatalities in Puerto Rico alone. Damages have been estimated at over \$125 billion from Harvey.

In 2018, Hurricane Michael came ashore on Mexico Beach, Florida, causing \$6.6 billion dollars in damages and 22 deaths, which occurred in Florida, Georgia, North Carolina, and Virginia.

The Board is working with EPA, state emergency management programs and its Associate Members from industry to evaluate the need for a Regional Emergency Motor Fuel Waiver that will enable early decision-making on the flow of motor fuel across state lines where a hurricane is expected to pass.

Regulatory Matters

As referenced above, a concern of states, businesses and industry is the shifting process of the federal regulatory environment. In order to make appropriate long-term investments in energy production, stakeholders must have an accurate expectation of what the regulatory environment is not only today, but also what it will be tomorrow and in the years ahead.

How then, do state public utility commissions plan for the use of energy resources over the next 30 years in order to meet the needs of the populace? Utilities should not be expected to make the massive investment to build power plants unless they can have confidence the regulatory policy of our country will be consistent, not one that forces utilities into cost prohibitive technologies and pre-mature upgrades.

America faced these regulatory ratcheting efforts years ago with the advent of the Clean Power Plan and the Waters of the United States rule among others. While the regulatory burden is beginning to lighten, there remains a constant need to balance the economic impact of regulations with responsible environmental stewardship.

The Southern States Energy Board offered its expertise during the past year to its member jurisdiction, Puerto Rico, in the development of the Island's energy policy and new regulatory framework. The government of Puerto Rico passed legislation last June privatizing the Commonwealth's government owned utility, the Puerto Rico Electric Power Authority.

With assistance from the U.S. Department of Energy, SSEB formed a Blue-Ribbon Task Force comprised of Puerto Rico citizens and experts from across the United States to provide advice and counsel on policy and regulatory issues. The results included the formation of a Puerto Rico Energy Bureau to serve as the Island's regulatory body; an Energy Public Policy Office; a process for the sale of the Island's generating assets to private entities; and the incorporation of a system operator to manage the structure and submit and update the integrated resources plan. All of SSEB's recommendations were adopted in the final legislation.

National Security

Energy security is national security. Building, replacing and expediting new and innovative energy infrastructure into the marketplace must be an urgent goal of our nation. In this digital age, with its ever-changing communications dynamics, secure energy infrastructure will be more critical than ever. America's energy infrastructure is an immense mix of power plants, transmission lines, pipelines, railroads, water-borne transit, energy storage facili-

ties, trucks and heavy earth movers, offshore oil rigs, computer-based communications, etc. A healthy national energy infrastructure drives job growth, wealth and international competitiveness.

America's greatest strength and resource, the interstate electric energy grid system, must be modernized and hardened against cybersecurity attacks that could destabilize or damage our way of life. Tremendous innovation is underway in the devices and infrastructure that manage the flow of power through our grid. But with all the changes come new avenues for potential cyber-attacks. SSEB advocates for and supports cybersecurity measures by states and the federal government that ensure the reliability and resiliency of the electric power system.

Our electric energy grid system will continue to grow based on population increases, the return of manufacturing industries to America, improvements in energy efficiency, adaption of new and innovative technologies and beneficial uses of our energy resources. In the future, consumers will expect a more reliable, safe, resilient and efficient grid with balanced regulatory policies that remove barriers to technology deployment and offer digital choices to customers.

Energy Storage

The energy grid of the future must include a means for energy storage that can augment the methods used by utilities to generate, deliver and consume electricity. Better energy storage options can improve power quality, reliability and resilience. Utilized during power outages caused by natural disasters or during peak load times, energy storage units can keep the flow of energy moving efficiently through the nation's energy grid. In Kentucky, Louisville Gas and Electric and Kentucky Utilities have formed a partnership to test energy storage options at the E.W. Brown Power Station in Mercer County. This project is in cooperation with the *Electric Power Research Institute*, and is developing, testing and evaluating the benefits of energy storage options and state-of-the-art battery technologies.

Environmental Stewardship

A core value of the Southern States Energy Board is its dedication to sound environmental stewardship. Energy Board Members include hikers and hunters, campers and outdoorsman, cyclists and boaters. What's more, the southern states contain some of the most scenic beauty found anywhere in the world. Our Board Members, and many of those whom we serve in our home states, are dedicated to protecting our environment for generations to come.

It should be recognized that good environmental stewardship and sound energy policy are not mutually exclusive. "All of the above" must truly mean all energy sources that the free market will support. It is imperative, however, that we keep our fuel sources diverse from a national security standpoint. We can utilize our coal, oil and gas resources in a manner that is environmentally friendly (as we are currently doing), while simultaneously spurring economic growth and job creation. We can, and must, balance our commitment to provide reliable energy for our citizens, especially those who are economically vulnerable, with our obligation to protect our environment.

That commitment can include the Southeast Regional Carbon Sequestration Partnership (SECARB) that promotes the framework and infrastructure necessary to enable industry to capture and utilize beneficial carbon dioxide for industrial and commercial purposes.

Public Private Partnerships

The value of public/private partnerships cannot be overstated. SSEB began working with the private sector in earnest through its Associate Members Program, which was initiated by Governor John Y. Brown of Kentucky in

1981 during his SSEB Chairmanship. The purpose was to bring the South's energy industries to the table with our members from state government, in order to better access the contributions that industry makes to economic and industrial development. This, in turn, engenders a better quality of life for all our citizens. Because of the many commonalities between states in our region (energy production, manufacturing, mining, energy modes of transportation, rural populations, etc.), it makes sense to work together as a region for greater benefit.

Some of SSEB's partnerships today look nothing like the original model. The SECARB partnership alone has more than 126 industry partners. Industries have contributed over \$254,000,000 toward current SSEB projects, well over 60% of the total, with other funding coming from states, corporate sponsorships, foundations, and individuals.

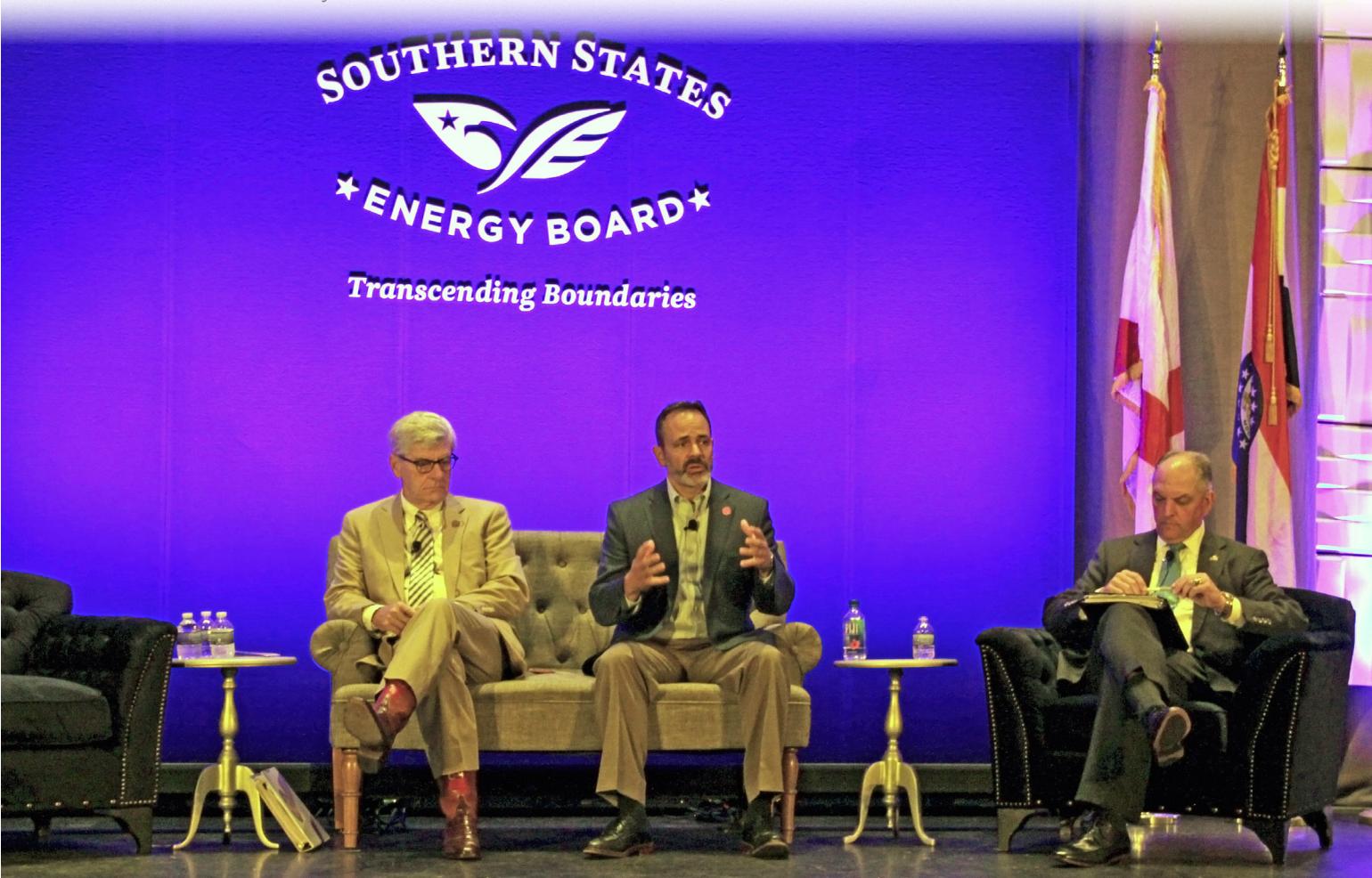
True to our Goals

The philosophy of the Southern States Energy Board and its staff has always been a simple one: How much in funding, education and outreach, smart policies, new technologies and lessons learned can we bring to our member states and territories? How can we give back more to our states and territories than they give to us each year? Over the years, SSEB has endeavored to achieve increasingly greater output with a small staff and a "can do" attitude. I believe that SSEB has far exceeded its goals this year and it has been an honor and a privilege to serve as Chairman of the Board.



Matt Bevin
Governor of Kentucky
Chairman, 2018-2019

Third Governors' Energy Caucus featuring Gov. Phil Bryant of Mississippi, Gov. Matt Bevin of Kentucky, and Gov. John Bel Edwards of Louisiana.



Special Projects & Activities

Regional Emergency Motor Fuel Waivers

During its 58th Annual Meeting in Biloxi, Mississippi, on September 17, 2018, the Southern States Energy Board unanimously passed an action resolution directing SSEB staff to prepare a report on the feasibility of developing a Southern Regional Mutual Emergency Motor Fuels Waiver Assistance Plan to be implemented by a Southern Regional Emergency Motor Fuels Council.

The purpose of the plan is to form a Council of government and business leaders to assist the U.S. Environmental Protection Agency (EPA) and the U.S. Department of Energy (DOE) in effecting a regional determination of the need for emergency motor fuels waivers in the preparation for major weather events, hurricanes, and natural disasters throughout the southern region culminating in a unified effort.

Year after year, the South tolerates losses of life, property, community, and infrastructure that take years to replace. It is time to establish a plan that will better protect the region and its citizenry for the future.

We can expect that natural disasters will occur in the future, yet we must meet these weather events with an offensive that protects our humanity and our infrastructure.

Through this report to the Southern States Energy Board, we propose that the Board foster development of a Council to be comprised of state government, affected federal agencies, and industry leaders throughout the region. The Council will work together in a cooperative spirit to alleviate the impacts of future motor fuels shortages.

Upon approval of the Plan, SSEB staff will contact state, federal, and industry officials to begin the process of forming the Council. The primary goal of the Council shall be to facilitate education and outreach on the need for a collaborative effort toward an effective and accelerated regional emergency motor fuels waivers process, application, submission, and implementation.

An initial objective of the Council will be to begin the preparation of a regional emergency motor fuels waivers playbook which will address the sequencing and the processes necessary for a state to request and potentially receive emergency motor fuels waivers.

3rd Annual Alabama Energy Day

On April 9, 2019, the Southern States Energy Board cohosted the 3rd Annual Alabama Energy Day with the Energy Institute of Alabama in Montgomery, Alabama. More than 150 lawmakers, public officials, and industry leaders gathered at the state capitol for a unique opportunity to engage state regulators, legislators, and other decision makers on relevant topics in the energy sector. Previous speakers include federal agency representatives, experts in nuclear generation, and national energy policy. Delivering this year's featured luncheon was Rick Dearborn and Marshall Macomber. The pair addressed attendees on measures being taken by FERC and PJM to value generation with on hand fuel supplies, electrification of school buses and other vehicles, and relating the importance of an infrastructure package to the state's economy.

Governor Kay Ivey was in attendance as well as SSEB Board Members (Sen. Clyde Chambliss, Sen. Cam Ward, Rep. Howard Sanderford, and Rep. Alan Baker), key legislative leaders and the state's Public Service Commissioners. This event also provides an opportunity for SSEB to engage with its Associate Members in the state.

The Energy Institute of Alabama is chaired by former Speaker of the House Seth Hammett, and the Institute's mission is to promote reliable, affordable and clean energy to help grow our economy, create high-paying jobs, and build public support for Alabama's energy industry. Learn more at www.energy-instituteal.org.

SSEB would like to thank Mr. Hammett and Mrs. Blake Hardwich of the Energy Institute of Alabama for the continued success experienced conducting the Alabama Energy Day. Building on this success, SSEB seeks to replicate this event with Board and Associate Members in other states.



Marshall Macomber and Rick Dearborn speak at the 3rd Annual Alabama Energy Day.

Educating 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. Examples of significant engagements from the past year include:

- Energy Briefing to Tennessee Freshmen Legislators | Presenter
- SSEB Briefings to Board Members | Presenters
- State Energy Offices, Briefing on SSEB Programs and Activities | Presenters
- Energy Institute of Alabama Energy Day | Co-sponsor
- SSEB Associate Member Meetings | Host
- Puerto Rico Center For a New Economy Black Start Conference, Strategizing an Electric Energy Policy and Regulatory Framework in Puerto Rico | Presenter
- 2019 Southern Chapter Spring Conference of the Energy Bar Association, Strategizing an Electric Energy Policy and Regulatory Framework in Puerto Rico | Presenters
- SECARB 14th Annual Stakeholder Briefing and Knowledge Sharing Series | Host and Presenters
- CO₂ Carbon Management Workshop, SSEB Perspectives on CCUS and Carbon Management in the Southern States | Presenter
- National Nuclear Materials Transportation Stakeholder Forum and Radioactive Materials Transportation Committee Meetings | Host
- Virginia Coal and Energy Alliance, SSEB, and Virginia Center for Coal and Energy Research's 40th Annual Conference and Expo, "Embarking on Coal's New Era" | Co-sponsor and Presenter
- SSEB Committee on Clean Coal Energy Policies and Technologies Meeting | Host
- Research Experience in Carbon Sequestration (RECS) Program | Co-sponsor
- EBI Energy and Environmental Summit | Presenter
- National Governors Association, NARUC, NASEO, Southeastern Association of Regulatory Utility Commissioners, Industrial CCUS, State Regional Energy Profiles, Clean Energy Vehicles, Southface Energy Institute, IEEE-PES | Participant
- Tribal Radioactive Materials Transportation Committee Meeting | Presenter
- Georgia WIPPTREX 2019 | Co-host
- Mississippi Radiological Transportation Symposium | Presenter
- Radiation Working Group Meeting | Presenter
- Southern Emergency Response Council Meeting | Host

Strategizing an Electric Policy and Regulatory Framework in Puerto Rico Providing Support in Maria's Aftermath

In September 2017, Puerto Rico was devastated by Hurricane Maria just six days before the Southern States Energy Board 57th Annual Meeting in Charleston, South Carolina. At that Annual Meeting, Governor Asa Hutchinson authored resolution number 13.2017 entitled, "Providing Support to Southern States Energy Board Member Jurisdictions in the Aftermath of Hurricane Disasters." SSEB members, including southern governors, legislators, and other state officials, unanimously passed the resolution on September 26, 2017.

The resolution calls for SSEB to provide support and technical guidance to the Governors of Puerto Rico and the U. S. Virgin Islands to restore and rebuild their critical electric energy infrastructure and coordinate cooperative assistance with its Associate Members, the nation's energy sector, and the federal government.

In April 2018, the U.S. Department of Energy selected SSEB to lead a project entitled "Strategizing an Electric Policy and Regulatory Framework in Puerto Rico." For the project, SSEB identified immediate, near, and long-term goals to develop a long-term energy strategy and regulatory reforms for an Island that continues to recover from a complete outage two years ago.

A vital part of this project was the establishment of a Blue Ribbon Task Force led by SSEB partners and composed of knowledgeable stakeholders from both Puerto Rico and the United States. Appointees to the Blue Ribbon Task Force represent a diverse group of organizations across multiple sectors but focused on three areas to present recommendations on an energy policy: regulatory framework, permitting, and markets.

Through two public meetings of the Blue Ribbon Task Force, both well attended by local elected officials, a number of consensus-based recommendations were considered and submitted to the Puerto Rico Legislature for inclusion in the Island's revolutionary energy legislation.

After being introduced in October of 2018, the Puerto Rico Energy Public Policy Act was signed into law in April 2019. This ground-breaking piece of legislation is the vehicle for progressive changes to the Island's electrical utility and their vision for the electric grid of the future. This legislation is in direct response to the Island's experiences following the hurricanes in 2017. All of the Blue Ribbon Task Force recommendations were addressed through legislation or appropriate state action.

SSEB was honored to offer its expertise in supporting Puerto Rico's effort to rebuild an electric grid and generation that is more resilient and maintains affordability for both the citizens and industry. In June 2019, SSEB concluded the project with a final report and debriefing in Washington, D.C., to DOE leadership.

Committee on Clean Coal Energy Policies and Technologies

The Southern States Energy Board's Committee on Clean Coal Energy Policies and Technologies has been an active part of the Board's public/private partnership network since 1984 and continued to pursue the issues facing coal use and the coal industry in 2019. Coal Committee members remain active during the year in support of policies and practices that further research and development and methodologies to enhance the use of coal.

In partnership with the Virginia Coal and Energy Alliance, the two organizations held their 40th Joint Annual Meeting in Kingsport, Tennessee, on May 20-21. The Honorable Lou Hrkman, Deputy Assistant Secretary for Clean Coal and Carbon Management at the U.S. Department of Energy opened up the meeting themed, "Embarking on Coal's New Era."



Onlookers watch a clean coal technology demonstration during the committee meeting.

A highlight of the meeting was the Committee’s session featuring three Public Service Commissioners from SSEB member states. Commissioner Talina Mathews, Kentucky, Commissioner Jeremy Oden, Alabama, and Chairman Ryan Silvey, Missouri, provided a glimpse into the regulatory world and the actions they have seen and taken surrounding coal generation. This panel facilitated many questions and great discussions between legislators and the regulators.

During a roundtable discussion moderated by Representative John Ragan from Tennessee, Committee members and others in attendance were able to participate in a live survey to facilitate discussion. The questions asked sought their opinion on a variety of relevant topics including: projections for coal generation closures over the next five years, ways governments can assist those impacted, and their projection for the amount of coal produced. By identifying specific topics and utilizing software that creates an immediate, anonymous response, we plan to analyze those responses to create more effective actions from the Committee.

Southeast Regional Carbon Sequestration Partnership

The Southeast Regional Carbon Sequestration Partnership is a public/private partnership underway at the Southern States Energy Board to ensure the availability of large volumes of carbon dioxide (CO₂) for various industrial purposes including injection into both oil and gas reservoirs for enhanced recovery (EOR) and into saline formations for permanent storage. SECARB is one of seven Regional Carbon Sequestration Partnerships (RCSPs) nationwide funded by the U.S. Department of Energy’s National Energy Technology Laboratory and cost-sharing partners. The primary goal of the SECARB Partnership is to promote development of a framework and infrastructure necessary for the validation and deployment of CO₂ capture, utilization, and storage (CCUS) technologies.

Key to the success of any CCUS project is an operator’s ability to predict and monitor the flow of CO₂ molecules injected into the subsurface and to communicate this information to stakeholders and regulators. The

U.S. Senator Shelley Moore-Capito, West Virginia, and Congressman Phil Roe of Tennessee keynoted the meeting and pledged their support for research and development funding and the need for guidance on carbon capture regulations.

SSEB’s Federal Representative, Senator Eddie Joe Williams, Secretary Charles Snavelly, Kentucky Energy & Environment cabinet, and Joe Giove, U.S. Department of Energy, added their expertise to discussions of the energy sector and the need for a balanced generation portfolio to support a reliable electric grid.



SECARB partners present project results and lessons learned.

SECARB Early Test began in 2009 at Denbury Onshore, LLC's active CO₂-enhanced oil recovery operation in the Cranfield oilfield near Natchez, Mississippi. The SECARB team has successfully field-tested a variety of CO₂ monitoring, verification, and accounting (MVA) technologies to determine their commercial viability and robustness. The SECARB MVA program at Cranfield concluded in January 2015, and the cumulative total stored CO₂ mass monitored at Cranfield is 5,371,643 metric tons. The three research wells were safely plugged and abandoned in accordance with the Mississippi Oil and Gas Board rules in April 2015. Denbury's commercial operations continue.

SECARB was the first of the regional carbon sequestration partnerships to begin CO₂ injection and the first to achieve the goal of monitoring a one million metric ton injection. SECARB was the first partnership to store CO₂ under a power plant in Escataupa, Mississippi. Data collected at Cranfield is utilized by the SECARB team and researchers worldwide to further refine reservoir models for similar geologic settings. In 2010, the international Carbon Sequestration Leadership Forum (CSLF) recognized the Early Test project at Cranfield for its outstanding accomplishments in advancing CCUS MVA technologies.

Knowledge gained from the Early Test was applied at the Anthropogenic Test site in Alabama, where CO₂ injection began in August 2012. Under separate funding, the CO₂ was captured at Alabama Power Company's James M. Barry Electric Generating Plant located in Bucks, Alabama. The CO₂ was transported 12 miles by pipeline and permanently stored within a deep saline formation at the Citronelle oilfield operated by Denbury. CO₂ injection ended in September 2014; more than 114,000 metric tons of CO₂ was injected and stored at the site. The SECARB partners applied proven and experimental MVA technologies to monitor CO₂ movement in the subsurface during the post-injection phase. The wells were plugged and abandoned in August 2018. In November 2013, the CSFL recognized the Anthropogenic Test project at Citronelle for its outstanding accomplishments in advancing CCUS technologies.

Previous research and technology development conducted under the SECARB Partnership led to the successful commercialization scale up at NRG's Petra Nova plant near Houston, Texas. Today, Petra Nova is the world's largest post combustion carbon capture facility attached to an existing coal-fired power plant. Regarding SSEB's role in the project, NRG Vice President David Greeson responded that "we couldn't have done this without the SECARB demonstration that convinced our investors of the viability of the technology."

SECARB continues to characterize the region's onshore and offshore geologic storage options, monitor federal and state regulatory and legislative activities, and support education and outreach efforts related to the program.

Southeast Regional Carbon Storage Partnership: Offshore Gulf of Mexico

Energy production from enhanced oil recovery will continue in the foreseeable future. An environmentally sustainable approach will be required to ensure the availability of the additional large volumes of CO₂ that need to be injected into both oil and gas reservoirs and saline formations to ensure energy security. Therefore, a carbon management approach capable of lowering industrial emissions in a manner that is both economical and publicly acceptable in the long-term is desirable. Associated carbon storage at commercial scale as part of an EOR operation or in a saline reservoir shows promise to help meet these goals.

The Southern States Energy Board is leading the SECARB Offshore Gulf of Mexico project, a partnership focused on subsea saline or associated geologic storage that combines the capabilities and experience of industry, academia, and government. This Partnership will develop and validate key technologies and best practices to ensure safe, long-term, economically-viable carbon storage in offshore environments.

Key advancements include the creation of a comprehensive knowledge base of existing and newly acquired offshore CO₂ storage resources and transportation infrastructure with the objective to down-select high-prospect geologic basins and specific reservoirs in the Gulf of Mexico for future offshore subsea CCUS project development. Monitoring, verification, and accounting (MVA) technology applications, geologic and dynamic flow mod-

els, and a preliminary risk registry for onshore CCUS projects will be tailored to the offshore environment, tied to specific, down-selected offshore CO₂ storage prospects. A summary of MVA best practices also will be developed, and a guidance document on the legal, regulatory, and technical feasibility of offshore CO₂ subsea storage projects will be published for governmental agencies, Federal and State policy-makers, regulators, industry, and the general public.

A strong partnership of universities and technical experts will contribute to the project, including: Advanced Resources International, Inc., Aker Solutions, Battelle Memorial Institute, Geological Survey of Alabama, Gerald R Hill, PhD, Inc, IOM Law, Louisiana State University, Oklahoma State University, Pale Blue Dot, Schlumberger, Virginia Polytechnic Institute and State University, Energy Institute of Alabama, Interstate Oil and Gas Compact Commission, Mississippi Energy Institute, and SAS Institute, Inc..

The University of Texas at Austin’s Bureau of Economic Geology leads the sister project under this DOE program. In February 2019, SSEB and BEG hosted a joint meeting in Beaumont, Texas, to share recent activities and findings in a public forum. The group also toured Cheniere Energy’s Sabine Pass LNG Terminal in Cameron Parish, Louisiana.



Group photo of the SECARB Offshore: Gulf of Mexico meeting in Beaumont, Texas.

Southeast Offshore Storage Resource Assessment

The Southern States Energy Board is leading a coalition of southern universities and technical experts to assess prospective geologic storage resources for carbon dioxide in the State and Federal waters of three planning areas:

- The Mid-Atlantic;
- The South Atlantic; and
- The eastern Gulf of Mexico.

The goal of the Southeast Offshore Storage Resource Assessment (SOSRA) project is to develop a high-level approximation of the amount of CO₂ that might be stored utilizing key geologic and environmental factors which influence the storage potential.

The research includes significant advances in knowledge and technology that facilitate assessment and quantification of offshore CO₂ storage resources in the SOSRA region and provide a pathway toward commercialization.

The project is funded by the U.S. Department of Energy’s National Energy Technology Laboratory, and SSEB serves as the overall lead for the project. To perform the work, SSEB has partnered with Virginia Polytechnic Institute and State University’s Virginia Center for Coal and Energy Research, the University of South Carolina,

and Oklahoma State University for local management of the three planning areas. Virginia Department of Mines, Minerals, and Energy, South Carolina Geological Survey, Geological Survey of Alabama, Advanced Resources International, Inc., and Gerald R Hill, PhD, Inc. also provide technical expertise to the project.

During Phase I, the team determined that the data quality and coverage within the study areas were adequate to facilitate a detailed assessment of offshore geology and quantification of CO₂ storage potential. Phase I of the

project was completed in 2017 with a recommendation from the team to move into Phase II. During Phase II the team performed numerical reservoir simulations to predict CO₂ plume extent over various time frames. The modeling identified well and reservoir configurations in the study areas that can meet the goal of 30 megatonne or greater storage capacity.

The project concludes in September 2019.



The SOSRA team meets in March in Atlanta.

Establishing an Early CO₂ Storage Complex in Kemper County, MS (Project ECO₂S)

The Southern States Energy Board is leading a coalition of universities and technical experts to establish a 438 million metric tons of capacity CO₂ Storage Complex adjacent to the Kemper County energy facility.

Project ECO₂S is pursuing key advances in CO₂ storage knowledge and technology, including optimizing CO₂ storage efficiency, modeling the fate of injected CO₂, and establishing residual CO₂ saturations. In addition, Project ECO₂S is involving “real-life” experiences, issues, and challenges of scaling-up from its regional, pre-feasibility assessment of CO₂ storage to establishing a site-specific, CO₂ storage complex, including capturing the “lessons learned” in making this transition.

Project ECO₂S is funded by the U.S. Department of Energy’s National Energy Technology Laboratory and headed by SSEB. Mississippi Power Company is serving as the site host. The project includes technical and field implementation support from Advanced Resources International and has analytical support from two national laboratories (Los Alamos and Lawrence Berkeley), a host of universities (Auburn University, Mississippi State University, Oklahoma State University, Virginia Polytechnic Institute and State University, University of Alabama at Birmingham, and University of Wyoming) and other key participants, including Battelle Memorial Institute and the Geological Survey of Alabama.

Three regionally extensive porous and permeable saline formations with thick confining systems have been identified at



Aerial photo of the Project ECO₂S well drilling.

the Storage Complex that provide attractive settings for injection and storage of CO₂. The Complex will have the capacity to receive 3 million metric tons per year of CO₂, and potentially three times as much as determined by pre-feasibility models, for a period of at least 30 years. The project will conclude on February 28, 2020.

Radioactive Materials Transportation

Southern States Energy Board continues its important work with the U.S. Department of Energy's Office of Nuclear Energy (DOE-NE) to create a comprehensive policy to safely transport and dispose of the nation's commercial inventory of used nuclear fuel and high-level radioactive waste. Through a cooperative agreement with DOE-NE, the Board maintains a Radioactive Materials Transportation Committee composed of gubernatorially appointed professionals representing each member state. The Committee convenes twice per year to receive federal program updates and lend their expertise on matters such as shipment planning and preparedness, training, routing, and communication protocols.

SSEB staff reports the progress and initiatives of the Committee throughout the year at the Radiological Working Group (RWG) Meeting. The RWG is a meeting of radiation program personnel from the Federal Emergency Management Agency Region IV states, in addition to federal, state, and local agencies/organizations involved in the nuclear power industry. The purpose of the meeting is to discuss any new or developing issues as they relate to or affect mutual states. This year's RWG convened on May 14th at the Nuclear Regulatory Commission's Technical Training Center in Chattanooga, Tennessee. A segment of the meeting included a tour of the NRC facility. The TTC develops and implements the policy and program for training of NRC inspectors and affords technical training for NRC personnel and other government agencies as requested. Part of the training regimen involves the use of simulators to duplicate the operational aspects of the various types of American reactors the NRC oversees, including both pressurized water and boiling water plant designs. The NRC has operated the TTC in Chattanooga since 1982, which originally housed the simulators to assist in the training of Tennessee Valley Authority (TVA) reactor operators. After the formal meeting of the RWG, participants were taken on a two-day tour of the TVA's mothballed nuclear plant in Alabama. The two-unit Bellefonte Nuclear Plant in Hollywood, Alabama (approximately 70 miles from Chattanooga) was never-completed. However, the NRC and TVA formalized a memorandum of understanding to allow its usage for instructional purposes. While many of the plant's components were either removed or sold, there is enough remaining foundation for training activities. One of SSEB's tasks with DOE-NE is to visit nuclear plants in the region undergoing decommissioning. Although Bellefonte did not receive fuel and produce electricity, studying the site's infrastructure yielded substantial information towards planning for interim storage and transportation.

Earlier in the year, SSEB staff and the Committee Chair, Quinton Dailey from the Alabama Emergency Management Agency, attended the Nuclear Energy Institute Used Fuel Transportation Table Top Exercise. This event provided a setting for a structured discussion among decision-makers around the key actions needed to transport used fuel from a nuclear power reactor site to a Consolidated Interim Storage Facility. The exercise allowed for a better understanding of the used fuel transportation planning and implementation processes through participant dialog, information transfer, and decision-making on legal, regulatory, and process requirements. The exercise helped bring clarity to their roles and responsibilities and also identified opportunities for operational streamlining and efficiency improvements.

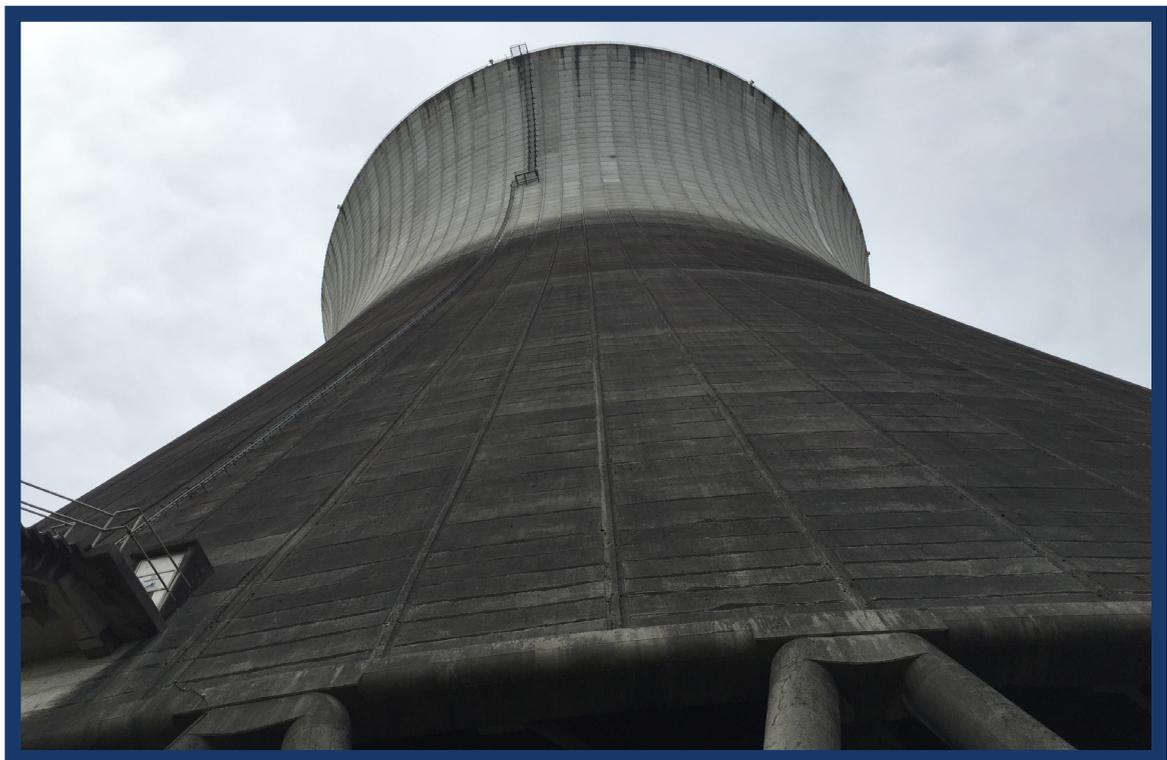
Transuranic Waste Transportation

Southern States Energy Board's Transuranic (TRU) Waste Transportation Working Group is the mechanism for working with DOE's Carlsbad Field Office to safely transport transuranic waste from within the region (Savannah River Site and Oak Ridge National Laboratory) for disposition at the Waste Isolation Pilot Plant (WIPP) in Carls-

bad, New Mexico. TRU Waste is byproducts or contaminants resulting from the production of Cold War era nuclear weapons. The TRU Working Group represents the member states along the shipment corridor enroute to the repository. These emergency response, law enforcement, and radiological health officials work with SSEB to develop work plans and budgets which detail specific plans and procedures to support TRU shipments to WIPP. The most recent submission negotiated by SSEB on behalf of the states resulted in the acquisition of funds of nearly \$2 million dollars to be used towards equipment purchases, public outreach, training, exercises, and other preparedness activities in accordance with the objectives of the national program. During the summer, the WIPP program achieved two major milestones by receiving its 12,500th transuranic waste shipment since operations began there in 1999 and exceeding 15 million safe miles of highway transport without serious accident or injury.

In March 2019, the state of Georgia held a Waste Isolation Pilot Plant Exercise or WIPPTREX in Dalton, Georgia. The three-day rodeo format event allowed several shifts of emergency responders to test their knowledge base and training by each participating in the same accident scenario. The Georgia Emergency Management Agency was the lead organization for the event and conducted the planning aspects of the exercise in conjunction with local officials from the city and impacted counties. In preparation for the event, several first responders were provided with Modular Emergency Response Radiological Transportation Training.

On April 4, 2019, the Mississippi Emergency Management Agency hosted the Radiological Transportation Symposium. This meeting, conducted in the State Emergency Operations Center, was designed to provide a deeper understanding of the various types of radiological/nuclear material transported through the State as well as to learn about operational practices, routing, and training. It was an opportunity for various organizations to learn about the WIPP program and its use of resources. Representatives from the Office of Secure Transport (OST), Waste Isolation Pilot Plant (WIPP), Southern States Energy Board (SSEB), 47th Civil Support Team (CST), Transportation Emergency Preparedness Program (TEPP), and the Mississippi State Department of Health (MSDH) were present to discuss how their agencies impacted the State in regard to this subject area.



Members toured the Bellefonte Cooling Tower located in Hollywood, Alabama.

Foreign Research Reactor Spent Nuclear Fuel Shipments

One of the core missions of the National Nuclear Security Administration (NNSA) is monitoring and promoting non-proliferation policy. To achieve this goal, NNSA's Nuclear Material Removal Program has partnered with the Southern States Energy Board since the mid-1990's in the domestic planning logistics associated with the removal and/or disposal of U.S. origin highly-enriched uranium (HEU) and low-enriched uranium from foreign countries. More specifically, the history of this endeavor originates from the U.S. Department of Energy's (DOE) solicitation of the Board for programmatic support of an urgent relief shipment entering the U.S. via a military port in North Carolina enroute to the Savannah River Site (SRS). SSEB responded by creating an adhoc committee (Foreign Research Reactor Spent Nuclear Fuel Transportation Working Group) composed of professionals representing various disciplines to oversee the coordination, transportation, and emergency response planning efforts associated with the return of these materials. As the program evolved, the Naval Support Activity Charleston would be designated as the east coast port of entry thus linking SSEB's involvement until the conclusion of the shipping campaign.



Jeff Galan of the National Nuclear Security Administration addresses the committees during a June 2019 meeting.

The Working Group hosts a conference call for the planning of each shipment destined for SRS, the most recent of which took place in February 2019. During the life of the program, the majority of the shipments have entered the U.S. via the southern region (Naval Support Activity Charleston) hailing from over 30 countries. In addition, 10 cross-county shipments have been conducted to move fuel from Charleston to the Idaho National Laboratory (INL).

Besides maritime movements occurring from overseas, the program also includes highway transport from Canada. The Canadian Campaign initiated in the summer of 2015 to return HEU from the Chalk River facility in Ontario to the SRS. If operational activities move according to schedule, the 56 HEU shipments are due to be completed before the end of the year. Furthermore, the Canadian shipments include Target Residue Material (TRM) which require unique handling and packaging requirements. A new loading facility, scheduled for completion for Fall 2020, featuring a dedicated retrieval and transfer system is being constructed to support an estimated 116 TRM shipments.

Most of the Nuclear Material Removal Program's domestic movements traverse many southern corridor states enroute to their eventual disposition at SRS or INL. Therefore, SSEB will continue working with the Department and its member states along the shipping routes to ensure these campaigns are carried out in a safe and efficient manner.

Southern Emergency Response Council

The Southern Emergency Response Council (SERC) is a committee responsible for the administration of a mutual aid agreement formalized by 14 southern governors in 1972 to offer state-to-state assistance in the case of a radiological incident involving a nuclear power plant. The SERC signatory states include Alabama, Arkansas, Florida, Georgia, Kentucky, Louisiana, Mississippi, Missouri, North Carolina, Oklahoma, South Carolina, Tennessee, Texas, and Virginia.

The Southern Mutual Radiation Assistance Plan (SMRAP) outlines how the 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. This document outlines the mutual aid agreement, the implementation process, emergency response contacts, and available state resources. As a part of the scope of this endeavor, 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, several states 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.

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 group met recently on August 20, 2019, in Minneapolis, Minnesota, to ratify the current edition of SMRAP.



Inventory of some of the radiological detection equipment at the NRC's Technical Training Center.

Energy and Environment Legislative Digest

The Southern States Energy Board's Legislative Digest serves as a compendium of energy and environmental legislation passed by the Board's 18 member states and territories. For more than four decades, SSEB has published the annual digest as a reference tool and guide for state legislators and their personnel. During the 2019 legislative sessions, our members passed more than 570 energy and environmental bills.

When examining legislation passed state-by-state it is not unusual to observe certain trends or themes. For example, this year several states passed legislation allowing electric utilities to install broadband services using, in part, their existing infrastructure. Alabama, Georgia, Maryland, Mississippi, North Carolina, Virginia, and West Virginia all passed bills in the interest of streamlining the process for broadband roll-out.

Several states also passed bills related to the fast-growing technology known as the blockchain. Alabama, Arkansas, Florida, Kentucky, and Texas passed bills referencing or related to studying blockchain technology. Kentucky is the only state to have explicitly mentioned its potential use in the energy industry, but multiple sources, including the Massachusetts Institute of Technology, have reported the ability to use the blockchain in efficiently managing certificates that track energy usage.

Two states, Kentucky and West Virginia, both approved resolutions urging President Trump to sign the Appalachian Sky Executive Order to provide "much needed economic opportunity" in areas hit hardest by the coal industry's decline. The Appalachian Sky Initiative could create thousands of aerospace-related jobs for Kentuckians and West Virginians.

Tennessee and Texas both passed new or enhanced criminal penalties related to trespassing on and vandalism of property considered "critical infrastructure," and Louisiana established the crime of "communication interference" for any person interfering with the transmissions of any public utility.



South Carolina established a process for the Public Service Authority Evaluation and Recommendation Committee to receive and consider offers of purchase or other arrangements such as entering into a management agreement for its publicly-owned electric and water utility, Santee Cooper.

Missouri passed new legislation establishing the Pesticide Education Fund in order to fund certification, education, and disposal program, and, similarly, Texas passed an amendment to establish a Pesticide Disposal Fund in order to administer pesticide waste and container collection.

Collaborations & Support

Our Partners

The Southern States Energy Board has many collaborative efforts underway and through these robust partnerships with government, business, industry, and academia, SSEB states and territories benefit from the expertise of energy and environmental leaders in the country.

The core of this strategy pivots on the Board's Associate Members who represent the region's and nation's energy providers, resource companies, educational institutions, and technology developers. The SSEB Associate Members program was founded in 1981 by Kentucky Governor John Y. Brown during his chairmanship. 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.

SSEB participates on the U.S. Technical Advisory Group of the International Organization for Standardization (ISO) Technical Committee 265 for the development of guidance and standards for carbon capture, transportation, and geological storage. Knowledge gained from SSEB's carbon management programs is being transferred through the ISO process to ensure that standards are both technically sound and that the South's position is represented. SSEB also is an initial founder of the Global CCS Institute, an international organization focused on accelerating the deployment of CCUS as an imperative technology.

Through a collaborative effort with the U.S. Department of Energy's Office of Fossil Energy and the U.S. Energy Association, the Board became a founding stakeholder in the Carbon Sequestration Leadership Forum in 2003. The policy and technical forums of CSLF further international cooperation and understanding of CCUS; legal and regulatory issues; intellectual property; and many related matters. The CSLF has recognized SSEB's two SECARB Partnership projects as international programs of excellence.

SSEB also works closely with the Government of Canada. This consular presence promotes business development, investment, tourism, culture, and information exchange between Canada and SSEB states and territories. The Board's partnership with Consuls General offices throughout the South has resulted in economic, educational, and scientific opportunities for our member states.

On a national level, SSEB is an affiliate member of the National Association of State Energy Officials. In this relationship, SSEB works closely with state energy office directors in the southern region on a wide array of programs, ranging from energy efficiency, weatherization, and energy security and infrastructure.

To foster regional cooperation and collaboration, the Board continues a strong working relationship with other regional organizations such as the Eastern Interconnection States Planning Council, the Southern Legislative Conference of the Council of State Governments, the Southeastern Association of Regulatory Utility Commissioners, the Virginia Coal and Energy Alliance, the Carbon Utilization Research Council, and the Southeast Energy Efficiency

cy Alliance. SSEB strives to foster ongoing relationships with other regional and state organizations with similar goals.

SSEB’s Radioactive Materials Transportation Committees have worked in conjunction with their counterpart committees of the other “state and tribal regional groups” including the Council of State Governments (North-eastern and Midwestern Offices), Western Interstate Energy Board, National Conference of State Legislatures, and Western Governors’ Association. This collaboration has resulted in the development of national policy and initiatives between the states, tribes, and Department of Energy for consultation and cooperation regarding issues associated with the safe transport of radioactive materials.

These are only a few examples of the collaborative relationships SSEB experiences through its diverse partner-ships. Building partnerships is an essential goal of the Board in order to leverage opportunities and expand its expertise to assist its member states. These collaborations allow SSEB to focus its program and financial commit-ments to the benefit of the entire southern region.

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 for-mula 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 grants and cooper-ative agreements.

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, cor-porations, trade associations, and public advocacy groups. The Associate Members program provides an oppor-tunity 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 spon-sorships to complement the Board’s CCUS projects and activities. SSEB also receives corporate sponsorships, registration fees, and in-kind contributions to support the expenses associated with the SSEB annual meeting and other events.

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

Our Year in Snapshots



Rep. Mark McBride and Ken Nemeth discuss SSEB projects in Oklahoma.



Dave Cagnolatti, Gov. Phil Bryant, and George Guidry gather during SSEB's Associate Member's Meeting.



Rep. John Ragan chairs a meeting for new Tennessee legislators.



Gov. Phil Bryant receives an SSEB eagle in recognition of his service to the Board.



Florida's PSC Commissioner Julie Brown, NRRI's Carl Pechman, SSEB's Kenneth Nemeth, Puerto Rico Energy Bureau Commissioners Ferdinand Ramos and Lillian Mateo, and Alabama's PSC Commissioner Jeremy Oden.



Joseph Giove, III, DOE, Hon. Lou Hrkman, DOE, U.S. Senator Shelley Moore Capito, West Virginia, and SSEB Federal Representative Hon. Eddie Joe Williams.



Gov. Asa Hutchinson hosts a meeting to discuss the application of new technologies for increased oil and gas production in the state of Arkansas.



Sen. Mark Norris (Tennessee), Rep. Weldon Watson (Oklahoma), Sen. Ken Yager (Tennessee), Rep. John Ragan (Tennessee), and Sen. Brandon Smith (Kentucky) hold a legislative panel at the 58th Annual Meeting.



Former SSEB Chairman Pete Turnham turned 99 years young this past year.

Membership

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*The Honorable Matt Bevin
Governor of Kentucky*



Vice Chair

*Rep. Lynn Smith
Georgia*



Treasurer

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*The Honorable Phil Bryant
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*Rep. Rocky Miller
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Member

*Sen. Terry Burton
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The Honorable Eddie Joe Williams



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SSEB*

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Sen. Jimmy Holley
Sen. Cam Ward (Alternate)
Rep. Howard Sanderford
Rep. Alan Baker (Alternate)
Sen. Clyde Chambliss (Governor's Alternate)

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Sen. Bruce Maloch
Sen. Gary Stubblefield (Alternate)
Mr. Michael Chapman (House Appointee)
Comm. Ted Thomas (Governor's Alternate)

Ms. Katie Beck (Governor's Alternate)

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The Honorable Ron DeSantis, Governor
Rep. Mike La Rosa
Rep. Jay Trumbull (Alternate)
Ms. Kelley Burk (Agriculture Commissioner's Appointee)

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The Honorable Brian Kemp,
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Sen. Jeff Mullis

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Comm. David Salyers (Governor's
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Sen. Bryan Hughes

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U.S. Virgin Islands

The Honorable Albert Bryan,
Governor

Virginia

The Honorable Ralph Northam,
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- Tennessee Valley Authority
- Troutman Sanders, LLP
- Virginia Center for Coal & Energy Research
- Virginia Coal and Energy Alliance
- West Virginia University

In Memoriam

Len Peters, Ph.D.

Energy and Environment Secretary, Kentucky



Dr. Peters worked closely with the board during his tenure as the energy and environment secretary for Kentucky, and his gregarious presence at our meetings will be greatly missed.

Gov. Kathleen Blanco

Louisiana



Gov. Blanco was the first female governor elected to serve the state of Louisiana. Serving from 2004-2008 means that she helped to lead Louisiana through the difficult process of responding to and recovering from Hurricane Katrina.

Sen. Gilmer Capps

Oklahoma



Sen. Capps was a friend of the board throughout his 36 years of service as a state senator in Oklahoma and during his tenure as Chair of the Southern Legislative Conference.

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770.242.7712



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