

Southern States Energy Board

# Southeast Regional Carbon Sequestration Partnership

Project Overview  
DE-PS26-O3NT41980

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November 3, 2003  
Pittsburgh, Pennsylvania



# Southern States Energy Board (SSEB)

- Non-profit, interstate compact organization established in 1960 by PL87-563 and 92-440
- Mission: “Through innovations in energy and environmental programs and technologies, the Southern States
- Energy Board enhances economic development and the quality of life in the South”
- Membership:
  - 16 U.S. States and 2 Territories
  - Each jurisdiction is represented by the governor, a legislator from the House and Senate and a governor’s alternate.
  - Federal Representative appointed by the U.S. President



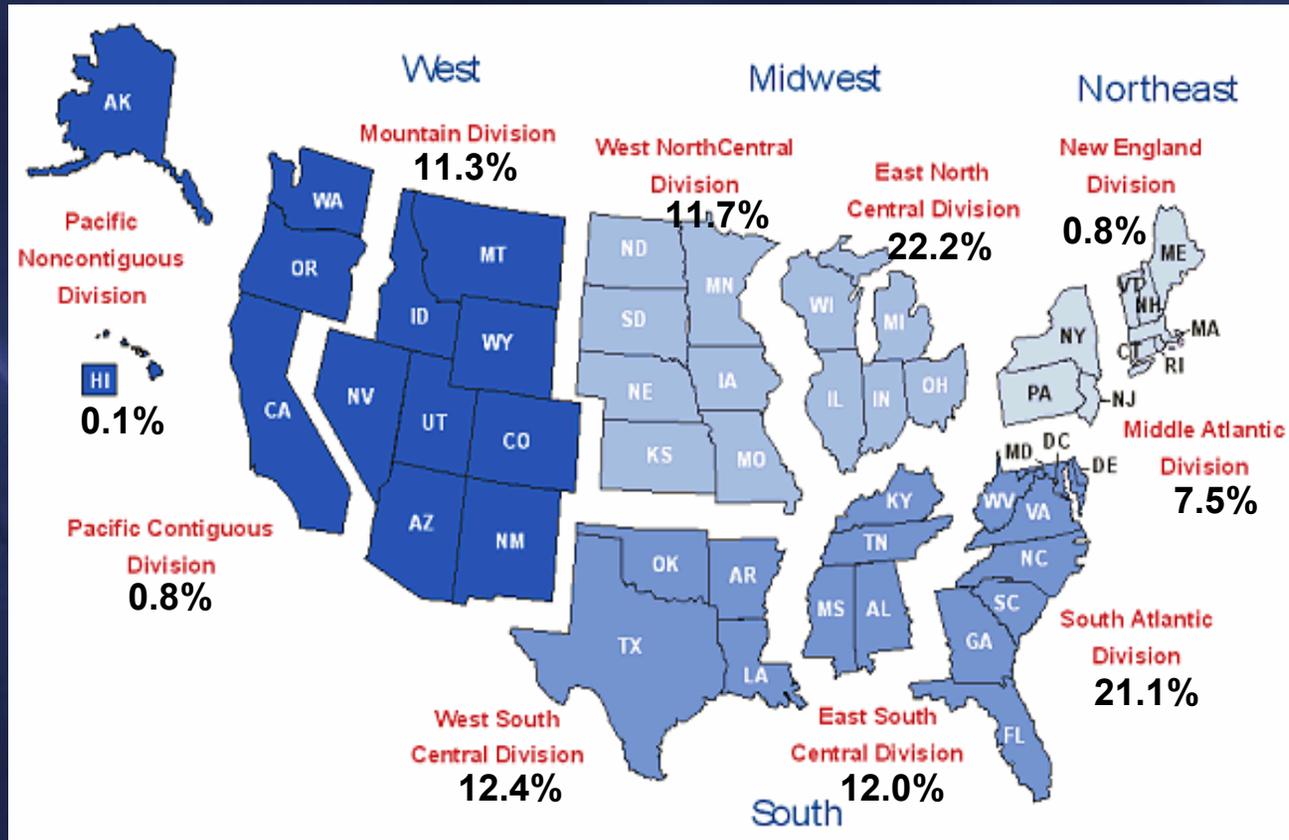
# Southern States Energy Board (SSEB)

SSEB's technology programs assist the region's stakeholders in addressing energy and environmental issues that transcend state boundaries and provide direct benefit to individual states.

- Clean Coal and Advanced Power Systems
- Water-Energy Interface
- Interstate Technology Regulatory Council
- Distributed Energy Resources
- Electric Utility Restructuring
- Pipeline Safety
- Greenhouse Gases and Carbon Management
- Permitting Leadership in the United States
- Radioactive Materials Transportation
- Southern States Waste Management Coalition
- Southern Emergency Response Council
- Associate Members/Utility Advisory Council



# CO<sub>2</sub> Emissions by U.S. Census Regions



# Carbon Dioxide Emissions and SSEB

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- In the SSEB region, coal is the primary fuel for electricity in 13 states.
- Forty-four percent (44%) of total U.S. CO<sub>2</sub> emissions originate from sources in SSEB member states.
- Total value of 1999 CO<sub>2</sub> emissions in the SSEB region was 1,218,579 thousand short tons.
- Significant potential for terrestrial and geologic sequestration sinks in the SSEB region
- Significant opportunities for value-added CO<sub>2</sub> sequestration



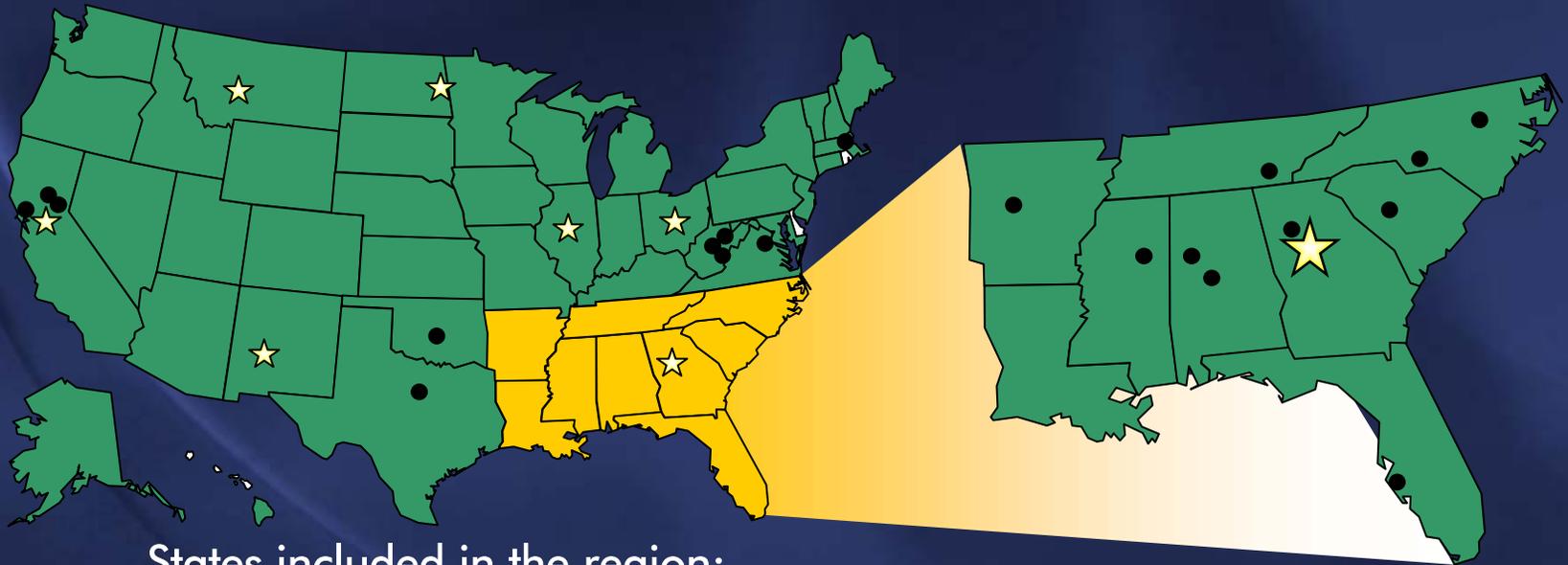
# Importance of DOE Region Carbon Sequestration Partnerships (RCSP) to SSEB

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- Research entities and technology businesses located in the SSEB region are playing key roles in DOE research.
- Sequestration technology innovation and cost-effective implementation are key to economic growth in the SSEB region.
- Due to the importance of sequestration to the SSEB region and its member states, industries and citizens, SSEB must play an active role in RCSP formation, response and activities.



# Southeast Regional Carbon Sequestration Partnership



States included in the region:

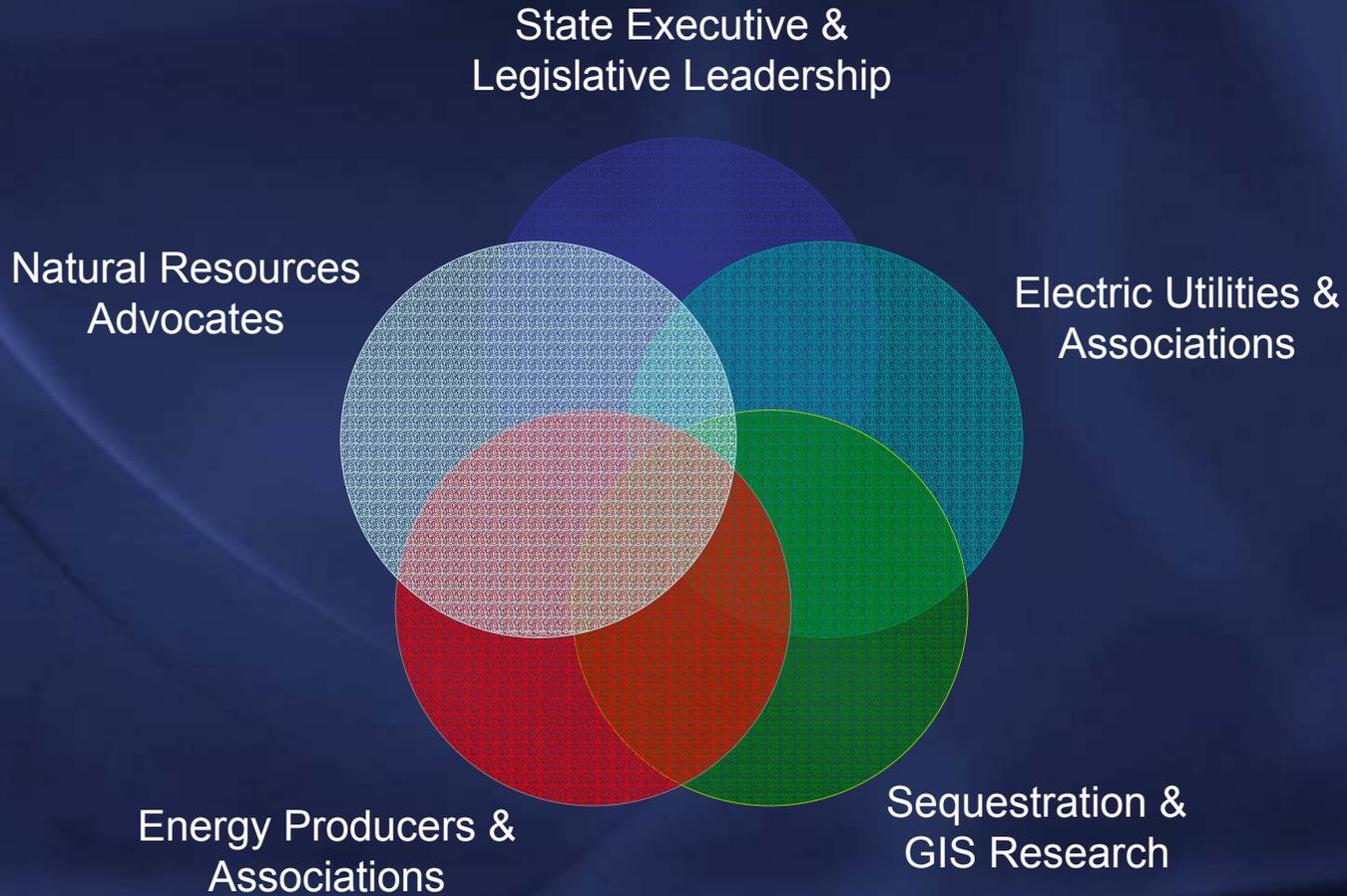
Alabama  
Florida  
Louisiana  
North Carolina  
Tennessee

Arkansas  
Georgia  
Mississippi  
South Carolina

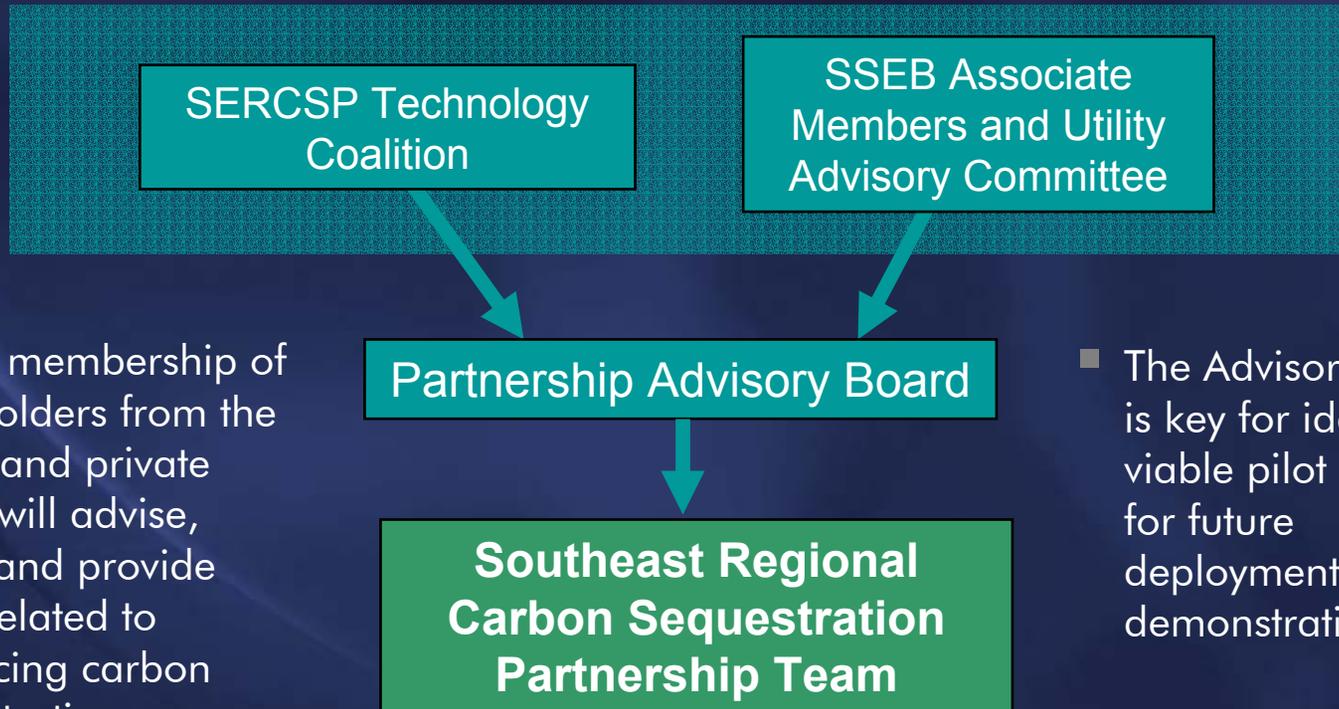


# Partnership Structure

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# Partnership Advisory Board



- A joint membership of stakeholders from the public and private sector will advise, guide and provide input related to advancing carbon sequestration deployment in the Southeast

- The Advisory Board is key for identifying viable pilot projects for future deployment demonstrations.



# Technology Coalition

The Hon. Mike Huckabee (AR Gov.)  
The Hon. Mike Foster (LA Gov.)  
The Hon. Ronnie Musgrove (MS Gov.)  
Representative Jerry Paul, Florida

Arkansas Oil and Gas Commission  
Georgia Environmental Facilities Authority  
Georgia Forestry Commission  
Louisiana Department of Environmental Quality  
North Carolina Energy Office  
South Carolina Department of Agriculture

Duke Power  
Progress Energy  
SCANA Energy  
Southern Company  
Tampa Electric Company

Interstate Oil and Gas Compact Commission  
The North American Coal Corporation  
Center for Energy and Economic Development  
Clean Energy Systems, Inc.

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The North American Coal Corporation  
Center for Energy and Economic Development  
Oak Ridge National Laboratory  
Clean Energy Systems, Inc.

**State Executive & Legislative Leadership**

**Natural Resources Advocates**

**Electric Utilities & Associations**

**Energy Producers & Associations**

**Sequestration & GIS Research**

# Technical Team

SSEB Governors  
SSEB Federal Representative  
SSEB Legislative Members

Geologic Survey of Alabama  
Susan Rice and Associates

EPRI  
Tennessee Valley Authority

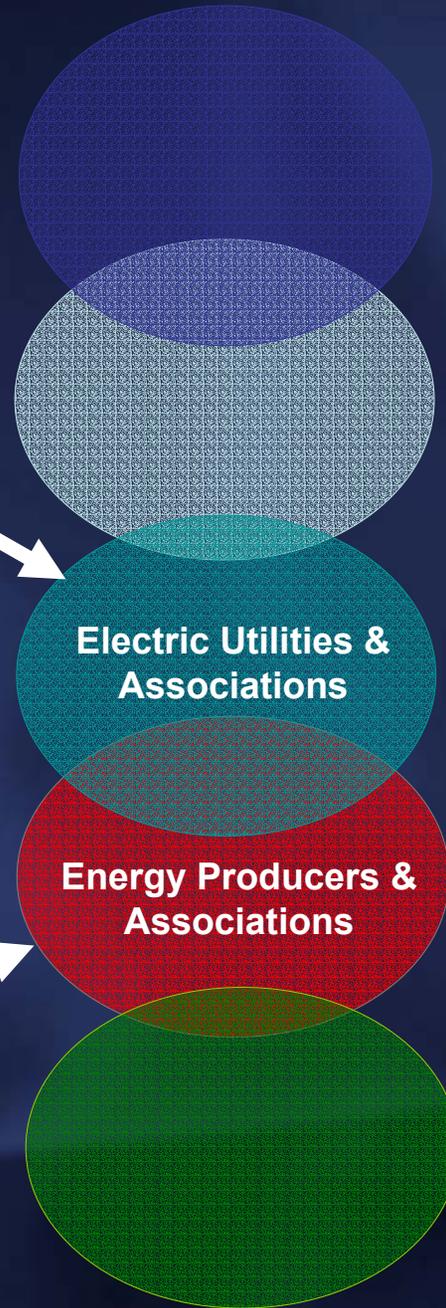
Advanced Resources International  
Augusta Systems, Inc.

MSU-DIAL  
Applied Geo Technologies  
MIT  
Winrock International  
NETL

# SSEB Associate Members/ Utility Advisory Committee

American Electric Power  
Dominion Energy  
Edison Electric Institute  
Energy Services  
Florida Power and Light  
Nuclear Energy Institute  
Old Dominion Electric Cooperative  
Progress Energy  
SCANA Corp  
Santee Cooper  
Southern Company  
TECO Services  
Tennessee Valley Authority

AGL Resources  
BP America  
Center for Energy and Economic Development  
Chevron Texaco Corp  
Dominion Resources



# Partnership Technical Team Qualifications



## ■ Southern States Energy Board

- Only interstate compact in the U.S. that is constituted by both federal and state laws that has governors, legislators and a Presidential appointee comprising its board of directors
- 43+ years experience effectively addressing energy and environmental issues that transcend state lines and require a regional or national approach
- Project partnerships are at the core of all SSEB committees/task forces



# Partnership Technical Team Qualifications



- Electric Power Research Institute (EPRI)
  - Creates science and technology solutions for the global energy and energy services industry
  - Multidisciplinary teams of scientists and engineers draw on a global network of expertise to solve today's toughest energy and environmental problems
  - Only science and technology consortium serving the entire power industry



# Partnership Technical Team Qualifications



- Mississippi State University Diagnostic Instrumentation Analysis Laboratory (MSU-DIAL)
  - National leader in evaluation of advanced energy processes and systems and in identifying methods to reduce emissions
  - Unique testing and instrumentation capabilities in these evaluations, primarily aimed at achieving optimal control of the process and product.



# Partnership Technical Team Qualifications



- **Augusta Systems, Inc.**
  - Aids clients, including NETL in characterizing the potential for geologic CO<sub>2</sub> storage and assessing tools available for greenhouse gas and carbon emissions strategic planning
  - Expert staff with experience in science and engineering companies, academia, research institutions and state and federal government to help clients meet greenhouse gas emissions management goals



# Partnership Technical Team Qualifications

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- **Massachusetts Institute of Technology (MIT)**
  - Dedicated to advancing knowledge and educating students in science, technology and other areas of scholarship that will best serve the nation and the world in the 21<sup>st</sup> century
  - Since 1989, MIT has conducted research into technologies to capture and sequester CO<sub>2</sub> from large stationary sources
- **Tennessee Valley Authority Public Policy Institute (TVA-PPI)**
  - TVA's electric system assets are used as a living laboratory to develop and demonstrate technologies and strategies that focus on improving reliability and efficiency throughout the system
  - PPI Greenhouse Gas Team provides input on policies and assesses strategies and technologies for reducing or offsetting greenhouse gas emissions



# Partnership Technical Team Qualifications

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- Winrock International

- Nationally and internationally recognized as an authoritative partner in the development and implementation of programs related to sound analysis and scientific measurement of carbon sequestration
- Long tradition of work in agriculture, forestry, natural resource management and clean energy and committed to applying the best available science and economics to find solutions to the world's development problems



# Partnership Technical Team Qualifications

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- **Applied Geo Technologies (AGT)**
  - Premier Native American-owned digital mapping company that provides hi-tech opportunities for its people
  - Leading provider of geospatial data and related services
- **Geologic Survey of Alabama (GSA)**
  - Extensive research in the area of petroleum and carbon sequestration have included reservoir characterization, coalbed methane, reserve studies, oil geochemistry and source rock evaluation, engineering studies and determination of the carbon sequestration potential of coalbed methane reserves
- **Susan Rice and Associates (SARA)**
  - Expert evaluation of health issues, including research and development in toxicology, pharmacology and related fields



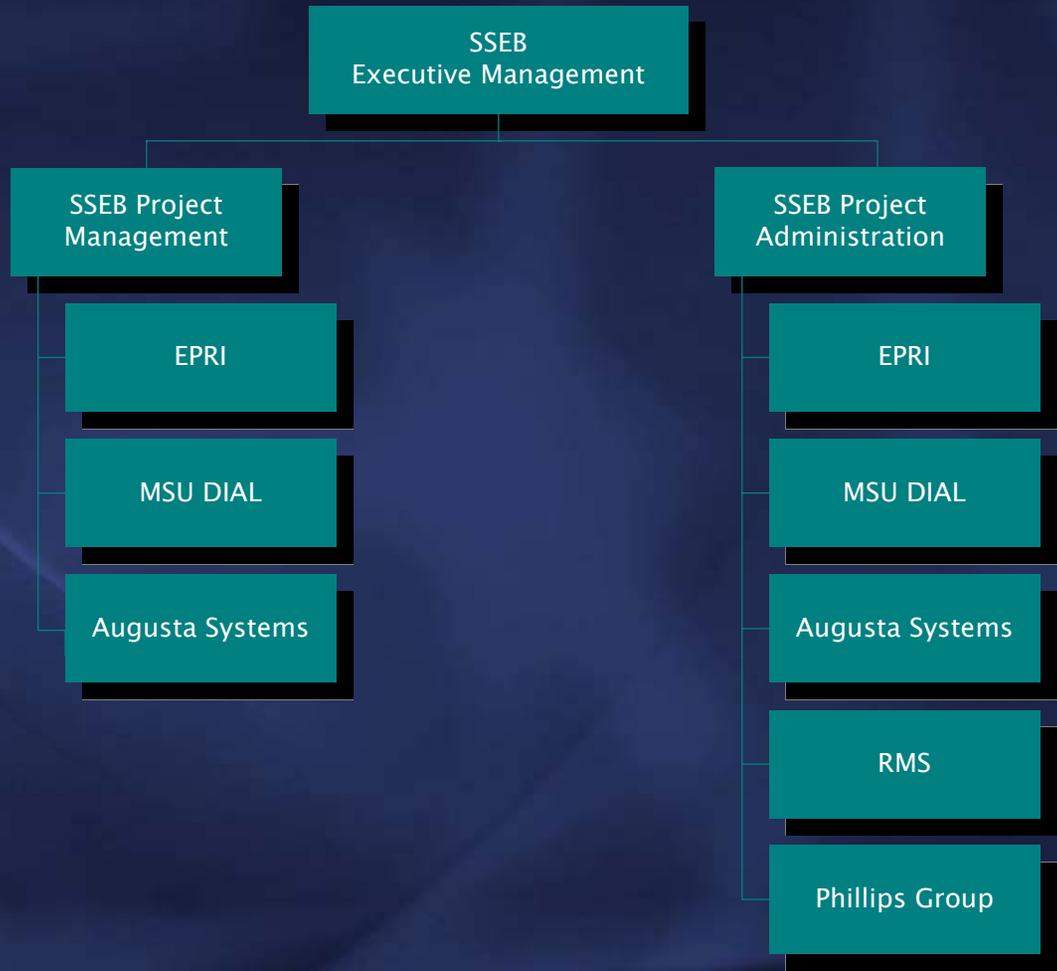
# Partnership Technical Team Qualifications

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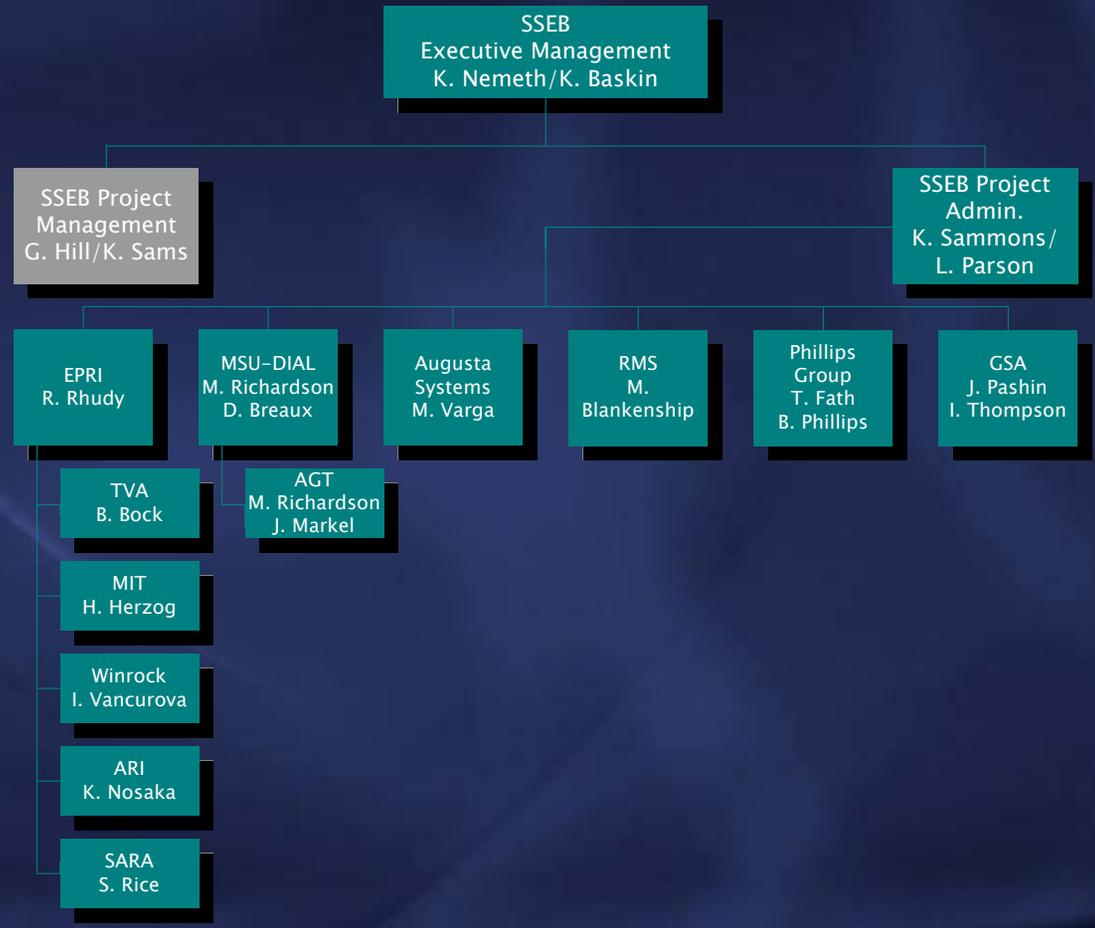
- **Advanced Resources International (ARI)**
  - Leader in the development and evaluation of geologic sequestration of CO<sub>2</sub>
  - Geologic and engineering service provider to the petroleum industry and R&D on upstream oil and gas exploration and extraction technologies
- **The Phillips Group**
  - Expertise in providing services in strategic communications counsel and public relations management
- **RMS Research (RMS)**
  - Prominent high profile communications strategy development and implementation to support decision making for clients in more than 30 states



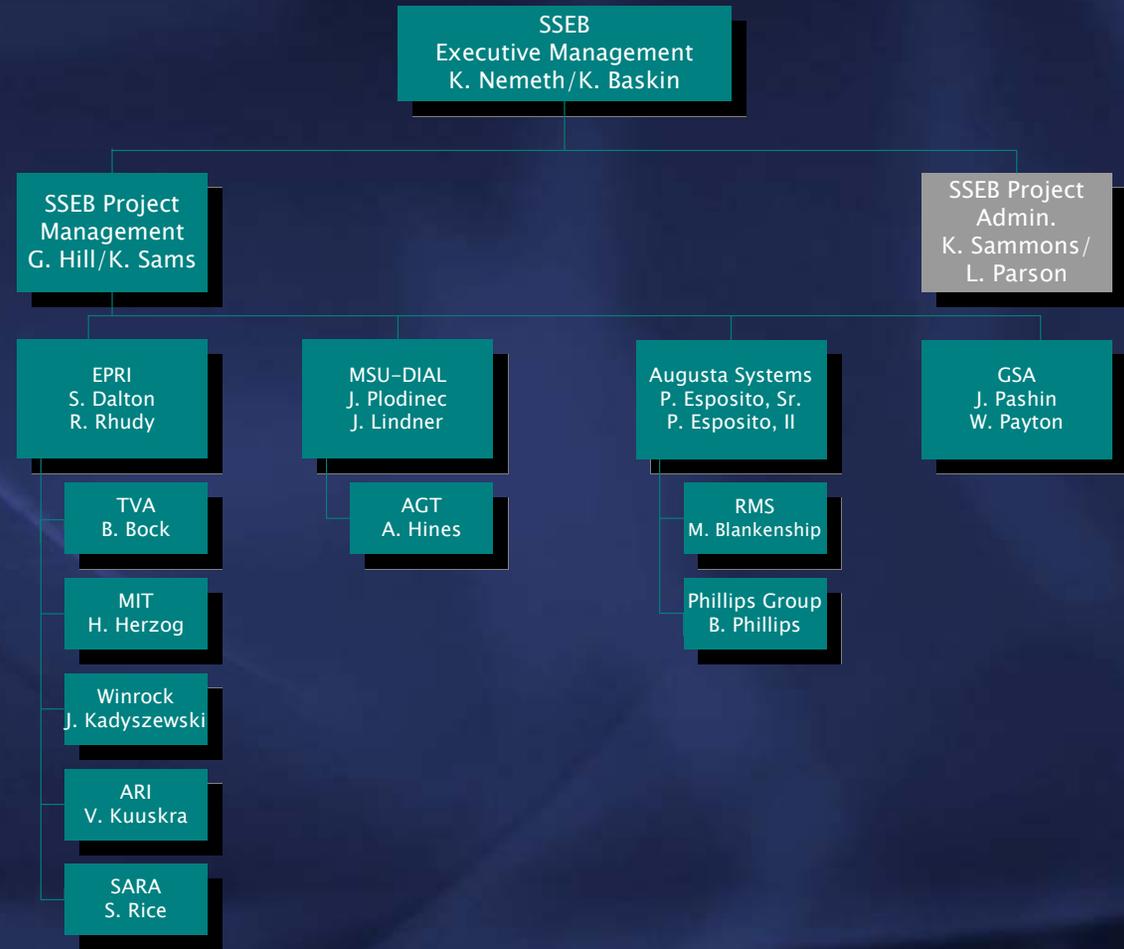
# Project Management & Administration



# Internal Communications-Project Administration



# Internal Communications-Project Management



# Partnership Objectives

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- Describe partnership sources, sinks and transport requirements
- Develop an outreach plan and engage stakeholders
- Assess environmental risk and develop measuring, monitoring and verification protocols
- Conduct permitting and regulatory review
- Evaluate the life-cycle of storage options
- Prepare action plans for implementation



# Areas of Investigation

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- Sources/Sinks
- Capture Options
- Terrestrial Sequestration
- Geological Sequestration
- Transportation Infrastructure
- Commercial Use
- Technology Deployment
- Public Involvement, Education and Acceptance
- Regulatory, Permitting and Accounting Frameworks



## Task 1:

# Define Geographic Boundaries of the Region

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- Lead: SSEB
- Support: EPRI, MSU-DIAL, Augusta Systems
- Milestones
  - Inventory major sources and potential sinks
  - Permitting Structure by State
  - Identifying Potential Partners



## Task 2:

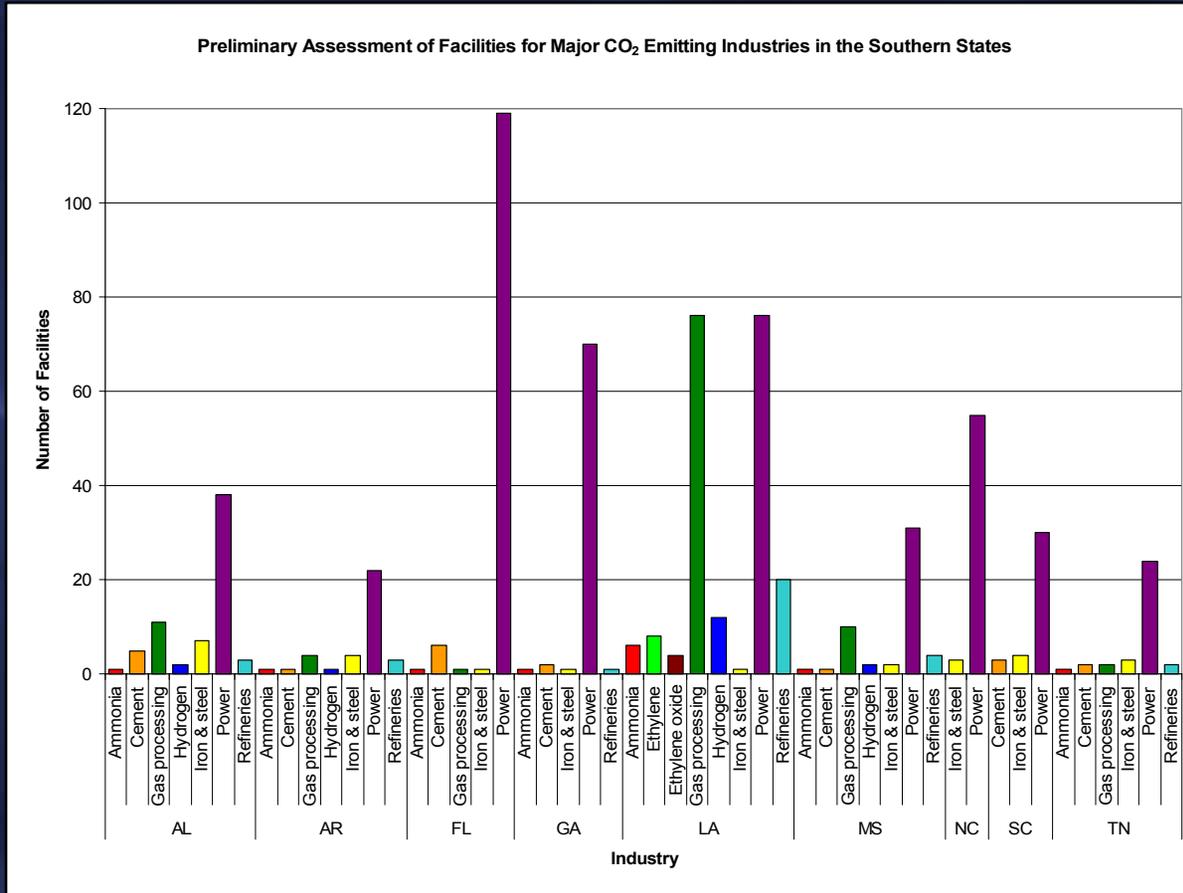
# Characterize the Region

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- Lead: EPRI
- Support: MSU-DIAL, MIT, TVA-PPI, Winrock, Augusta Systems, Applied Geo Technologies, Geologic Survey of Alabama, Advanced Resources International
- Milestones
  - Preliminary assessment of sources
  - Preliminary assessment of storage options
  - Preliminary assessment transport/infrastructure, separation/purification capacity and CO<sub>2</sub> Use



# Task 2: Characterize the Region



## Task 2:

# Characterize the Region

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- Variety of CO<sub>2</sub> emitting industries (power plants are most common in the Southeast)
  - Focus study on power plant locations and emission estimates, along with proximity of transport infrastructure and potential CO<sub>2</sub> sinks
  - Ammonia plants (located primarily in Louisiana) will be closely assessed due to the purity of their CO<sub>2</sub> streams
- Geologic sequestration opportunities
  - sedimentary rock deposited into shallow non-marine and deep marine environments



## Task 2:

# Characterize the Region

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- Terrestrial sequestration opportunities
  - Agricultural land, grazing land and forestland
- Transportation infrastructure
  - Existing functioning CO<sub>2</sub> infrastructure (pipelines and other transportation infrastructure), separation and purification capabilities and a network of equipment suppliers



## Task 3:

# Identify and Address Issues for Technology Deployment

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- Lead: SSEB
- Support: EPRI, MSU-DIAL, Winrock, Augusta Systems, Susan Rice and Associates, The Phillips Group, RMS Research
- Milestones
  - Preliminary Assessment and Action Plan for:
    - Safety, regulatory and permitting requirements
    - Overcoming public perception issues
    - Ecosystem impacts
    - Monitoring and verification



## Task 4:

# Development Public Involvement and Education

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- Lead: SSEB
- Support: Augusta Systems, The Phillips Group, RMS Research
- Milestones
  - Preliminary public involvement and education mechanisms
  - Test, refine and implement



## Task 5:

# Identify Most Promising Capture, Storage and Transport Options

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- Lead: EPRI
- Support: MSU-DIAL, MIT, TVA-PPI, Winrock, Augusta Systems, Geological Survey of Alabama, Advanced Resources International
- Milestones
  - Summary and promising capture options
  - Summary and promising transportation options
  - Summary and promising storage options
  - Maps linking sources to potential commercial users



## Task 6:

# Prepare Plans for Technology Validation Activity

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- Lead: SSEB
- Support: All Technical Team Members
- Milestones
  - Action Plan and Implementation for
    - Capture options
    - Transportation activity
    - Sequestration options
    - Commercial use
    - Public involvement and education mechanisms
    - Regulatory, permitting and accounting framework
    - integration



# Deliverables

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- Documentation
  - Results/summaries of findings from assessments
  - Action Plans
  - Report of specific activities as identified in the detailed scope of work for each task
- Computer Products
  - Quarterly Partnership updates
  - Participant list updates
  - Topical Report



# External Lines of Communication

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- Attend annual NETL Regional Carbon Sequestration Partnership Conferences, 2004-2005
- Attend semi-annual contract review meetings
- Prepare quarterly Technical Team meetings and frequent conference calls
- Develop and maintain a “Southeast Regional Carbon Sequestration Partnership” website
- Disseminate project results to DOE and stakeholders in the region



# External Lines of Communication

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- Communicate/collaborate with other interested parties inside and outside the region to execute an effective outreach program
  - All Regional Carbon Sequestration Partnerships
  - Federal, state, local and tribal governments
  - Technology developers
  - Industry partners
  - Community organizations





# Potential Issues and Obstacles and Methods for Mitigation

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- Availability of financial resources could limit the extent of investigation that could be performed
  - The Partnership will apply its financial resources to the most promising options identified
- Carbon sequestration issue poses significant communication and education challenges
  - Formalized public opinion and issues research efforts will allow the Partnership to confidently identify specific attitudes and opinions
  - Technical Team expertise in these areas will enable the Partnership to accurately predict some important awaiting challenges



# Potential Issues and Obstacles and Methods for Mitigation

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- Barriers to the implementation of the most promising options could require extensive changes to regulatory and permitting requirements
  - Members of the Technical Team have extensive experience in addressing such issues with regulatory agencies and with state legislative bodies



# Anticipated Impact

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- Carbon sequestration is vital for continued use of coal and natural gas, which are vital to the economy in the SSEB region.
- Carbon sequestration will be vital to the future prosperity of the SSEB region.
- The Partnership's work will educate stakeholders on the value of carbon management and carbon sequestration.



# Next Steps

## *Southeast Regional Carbon Sequestration Partnership*

- The Partnership will work to support the efforts of President George W. Bush and his team to research, develop and demonstrate cost-effective carbon sequestration technologies.
- The Partnership will encourage and foster active participation among its regional industries, governments, research entities and other enterprises.



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