

# CLIMATE CHANGE

*A Summary of Southern Company Actions*



**“While policy discussions continue, there really is no longer a debate about whether or not to take action to deal with climate change. In fact, we are already taking action and we realize that more will be required. ...We must avoid the extreme ends of the policy debate and move forward with solutions that make sense for the environment, our energy and economic needs, and our way of life.”**

*Remarks by Southern Company CEO David Ratcliffe  
at “The Power of Technology - Ensuring the Global Future  
of Coal” forum in Washington, D.C. on February 5, 2007.*

## Overview

Southern Company's efforts on the climate change issue began in the early 1990s when it became a founding member of the U.S. Department of Energy's (DOE) Climate Challenge program. Through more than 20 projects and the planting of more than 45 million trees, the company has reduced, avoided, or sequestered more than 140 million metric tons of carbon dioxide (CO<sub>2</sub>) since the mid-1990s.

In 2005, Southern Company released a comprehensive review of the impact of several potential CO<sub>2</sub> price scenarios on the company, including a review of available technologies. The *Environmental Assessment: Report to Shareholders* concluded that the development of cost-effective, low-emitting technology is needed to address the climate change issue. The report is available at [www.southernco.com/planetpower/report.asp](http://www.southernco.com/planetpower/report.asp).

In 2006, the company released its first *Corporate Responsibility Report*, available at [www.southernco.com/planetpower/ccr.asp](http://www.southernco.com/planetpower/ccr.asp). This report reviews Southern Company environmental, financial, community, and workplace responsibilities, as well as activities in each of those areas; information on current and projected CO<sub>2</sub> emissions; and an update on the company's technology development efforts.

Southern Company is keenly aware of the current level of activity in Congress, the states, and in the international arena on the climate change issue, and continues to review and evaluate all policy proposals advanced to deal with the issue. Recently, the Edison Electric Institute issued a set of policy principles that identify important considerations which should be included in any federal action or legislation. Southern Company, an EEI member company, supports those policy principles. (See Appendix inside the back cover for the EEI principles.)

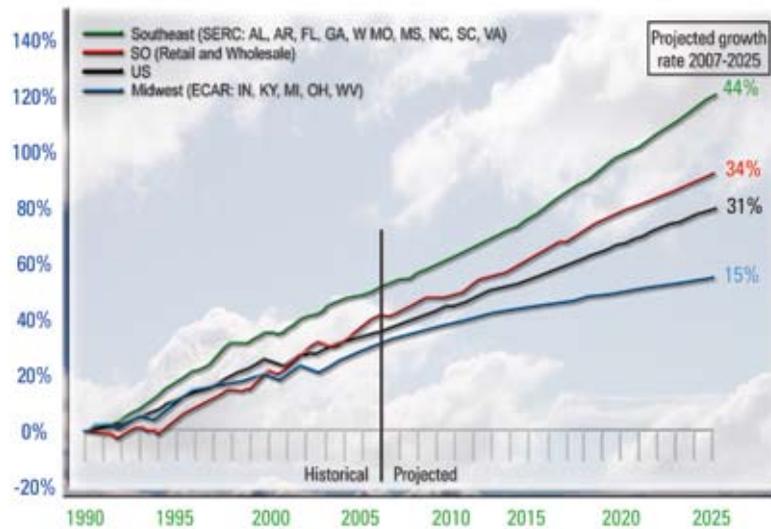
The company believes that the availability of technology, economic impacts to customers and shareholders, fuel diversity, energy security impacts, and the global nature of the issue must all be considered as Congress debates legislation. Southern Company continues to believe that, first and foremost, cost-effective technologies must be developed and deployed if this complex issue is to be responsibly addressed. Southern Company is at the forefront of development of these technologies. The following outlines the challenges associated with the climate change issue and Southern Company's responses to those challenges.



# Challenges

Figure 1 shows the projected growth in the demand for electricity in Southern Company's four-state region, from the DOE's Energy Information Administration and the company's own projections for its service territory. As can be seen, both the Southeast as a whole and Southern Company's area are projected to continue to grow at rates that exceed the national average. It is projected that the growth in Southern

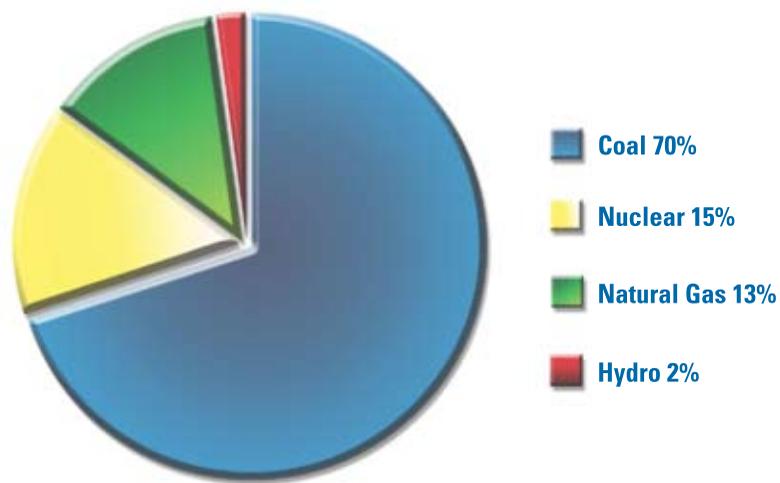
**Electricity Growth 1990 - 2025**



**FIGURE 1**

The sources of Southern Company's generation in 2006 are shown in Figure 2. As can be seen, coal supplied 70% of the company's generation, nuclear power 15%, natural gas 13%, and renewable hydroelectric power 2%.\* This generation mix has enabled Southern Company subsidiaries to continue to have prices that are among the lowest in the U.S.

**Southern Company Generation Mix 2006**

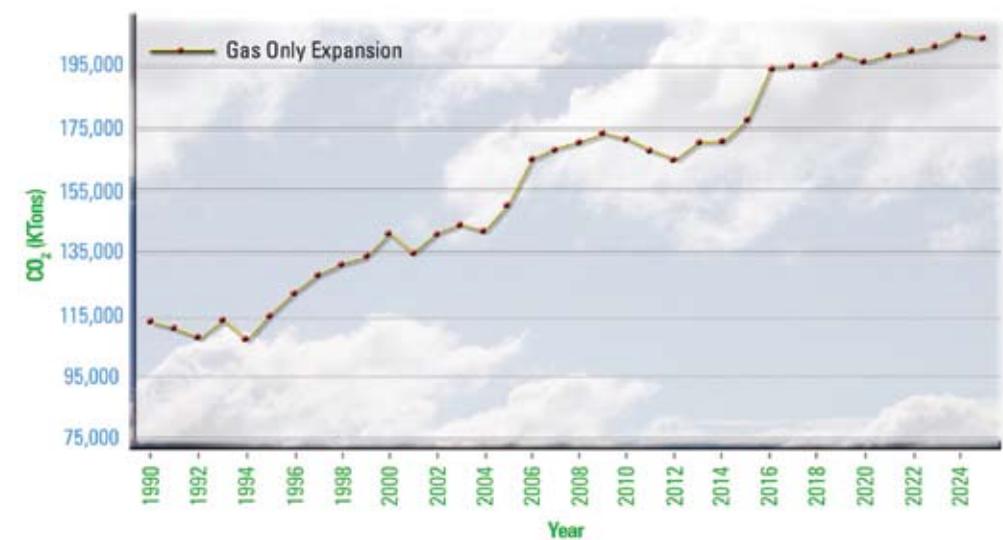


**FIGURE 2**

Company's service territory will result in a need for more than 15,000 additional megawatts (MW) of generating capacity by 2025. (One megawatt will provide power for approximately 250 homes.)

Assuming the entire need for new generation in Southern Company's service territory is met by natural gas through 2025, the company's projected CO<sub>2</sub> emissions are shown in Figure 3. While new natural gas-fired combined-cycle power plants are efficient and have about half the CO<sub>2</sub> emissions of coal, a strategy to meet growing energy needs based solely on natural gas presents challenges from a price standpoint, as the price of natural gas has fluctuated greatly in recent years. Natural gas also poses challenges from an energy security standpoint, since assumptions about moderating natural gas prices over the next decade depend largely on imported liquefied natural gas.

**Annual CO<sub>2</sub> Emissions**



**FIGURE 3**

To address these challenges while meeting this growing demand for energy, low-emitting, cost-effective electricity generation and end-use technologies must be researched, developed, and deployed. To that end, Southern Company has committed substantial financial and human resources. The following sections review the company's current activities.

\* 2006 was a lower than average year for hydroelectric generation; typically, this renewable source provides 4% of our annual generation needs.

## Energy Efficiency

Demand-side management and energy efficiency and conservation can lower growth in the demand for electricity, reducing the need to build new generating capacity and reducing growth in CO<sub>2</sub> emissions. To date, demand-side programs at our retail operating companies have avoided the need for nearly 3,000 MW of generating capacity. These programs include:

- Direct load control
- Time of use rates and real time pricing
- Energy audits
- Good Cents
- Good Cents Select
- Energy Star
- Energy efficient electrotechnologies

In 2006 alone, Southern Company invested some \$73 million to promote energy efficiency.

In March 2007, the company announced that it will fund the efforts of the Southeast Energy Efficiency Alliance over the next three years. The Southeast Energy Efficiency Alliance promotes energy efficiency in the Southeast and is affiliated with the Alliance to Save Energy.

Southern Company is also among more than 50 leading energy organizations working with the U.S. Environmental Protection Agency to develop a National Action Plan for Energy Efficiency. Additionally, in 2007, the company announced its participation as a charter member of the Electric Power Research Institute's national energy efficiency initiative, including living laboratories developing new "smart" appliances and energy management technology. Also, since 2005,



Southern Company has been instrumental in organizing utilities to begin technology development efforts to assist industrial, commercial, and residential customers to improve their overall energy efficiency.

Additionally, across the Southern Company system, the company is asking customers to "take the pledge." The EPA's ENERGY STAR® "Change a Light, Change the World" campaign is a nationwide effort to build awareness about energy efficiency and educate consumers on ways to save electricity and lower their energy costs by urging them to change one incandescent bulb to an ENERGY STAR-qualified compact fluorescent light bulb (CFL). In fact, switching to an ENERGY STAR-qualified bulb in the five most used fixtures in a home can make a significant impact. If every American household made the switch, the nation would save about \$6.5 billion each year in energy costs and prevent greenhouse gas emissions equivalent to more than 8 million cars.



Southern Company subsidiary Georgia Power is even giving its customers their first CFL light bulb when they "take the pledge." Georgia Power has helped Georgia to become the leading state in the "Change a Light" program nationwide, with 76,500 pledges so far, and has received the ENERGY STAR Excellence in Promotion award for its efforts.

Southern Company is also a Diamond member of the Geothermal Heat Pump Consortium. This group seeks to expand awareness and use of geothermal heat pumps, which have the potential to use 25% to 40% less energy than traditional heating, ventilation, and air conditioning systems.

## Renewables

Renewable energy has the potential to supply electricity with little to no CO<sub>2</sub> emissions and is beginning to make a substantial contribution in certain areas of the country. At Southern Company, renewable hydroelectric power supplied about 2% of the company's generation in 2006. The company continues to research and evaluate the potential for additional cost-effective use of renewable energy in the Southeast. Southern Company is currently active in the following areas:

- **Wind** – In 2005-2007, the company, in conjunction with the Georgia Institute of Technology, conducted an evaluation of the potential for the installation of wind turbines off the Georgia coast. While the evaluation showed that the turbines were not economically viable at this time and faced permitting difficulties, Southern Company continues to evaluate potential sites for wind turbines in our region.

It is important to note that wind energy, especially in the Southeast, is an intermittent source of power that cannot be relied on to serve customers who need electricity whether the wind is blowing or not. Therefore, even if sites can be found where the wind is steady and turbines can be permitted, the potential for this source making a substantial contribution to the energy needs of the Southeast is low.

- **Biomass** – Southern Company continues to evaluate the potential for the use of biomass energy in its area. Biomass, from such fast-growing sources as switchgrass, has the potential to reliably and economically supply a few hundred MW (out of a need for some 15,000 MW by 2025) of generation in our service territory.



Southern Company's biomass research and development program has included extensive investigation of co-firing biomass at our existing pulverized coal power plants. The company has tested several types of biomass including chopped switchgrass, cubed switchgrass, sawdust, and large wood chips, and is currently working with the U.S. Forest Service to evaluate co-firing small wood chips derived from thinning trees in the

Talladega National Forest. The project is a "win-win" for the Forest Service and Southern Company. The National Forest would benefit by thinning select trees to improve habitat for bird species such as the red-cockaded woodpecker and wild turkey, while Southern Company would benefit by using the tree thinnings as a renewable fuel.

## Nuclear Power

Emissions-free nuclear power currently supplies about 15% of Southern Company's generation from three nuclear power plants. The company is currently seeking an Early Site Permit to preserve the option to construct two additional units at Plant Vogtle in Georgia, and is working with nearby utilities to evaluate the potential for additional capacity at other sites in the Southeast. If it is assumed that all of the additional generation needed in our service territory after 2016 could be supplied by non-emitting nuclear power, Southern Company's CO<sub>2</sub> emissions profile would look like Figure 4. This would be an optimistic scenario given that no new nuclear plant has been ordered in this country since the 1970s -- this scenario would involve deployment of about nine new nuclear units -- one new nuclear unit every year -- from 2016-2025 and would require about \$29 billion in capital expenditures over that period.

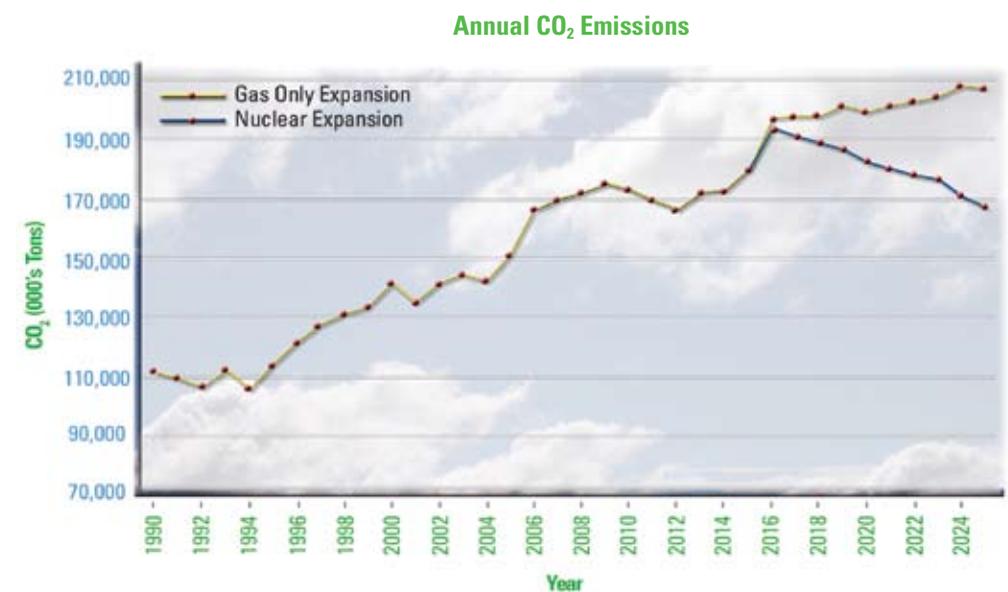


FIGURE 4

## Coal

Coal is the nation's most abundant fossil fuel, with U.S. reserves representing 200 years supply at current usage rates. Southern Company believes that coal is essential to a stable and affordable supply of energy for America. Therefore, the nation must find ways to use coal more cleanly. With today's technology, it is estimated that CO<sub>2</sub> capture and geological sequestration would add 60-70 percent to the cost of electricity from a new plant. This is clearly not a desirable result – substantial technological advances are needed.



Southern Company is at the forefront of developing advanced clean coal technologies. Along with the DOE and the Orlando Utilities Commission, the company is building a 285-megawatt integrated gasification combined cycle power plant in Florida, demonstrating the cleanest, most efficient coal-fired power technology in the world, with 20-25 percent less CO<sub>2</sub> emissions than the current fleet of existing coal plants. The facility will be operational in 2010. The gasification technology being used is unique, developed over time by Southern Company, the DOE and others. It's called Transport Integrated Gasification (TRIG™). The TRIG gasifier is uniquely suited for the sub-bituminous and lignite coals that make up about half of the world's proven coal reserves. In addition, it is expected that CO<sub>2</sub> capture and geological

sequestration will be less expensive with gasification technology than existing coal-based technologies. The company has also received DOE certification and IRS approval of tax credits for the possible construction of an additional 600 MW gasification plant in Mississippi, also using TRIG technology and locally-mined lignite.

Southern Company remains actively involved in research on CO<sub>2</sub> capture and sequestration. The company is funding research to improve CO<sub>2</sub> capture technology; for example, the company is a key contributor to the Electric Power Research Institute-sponsored CO<sub>2</sub> Test Center Project which seeks to demonstrate new and innovative technologies that could lower the cost of capturing CO<sub>2</sub> from power plants. Mississippi Power's Plant Daniel is a host site for underground CO<sub>2</sub> injection under the Southeast Regional Carbon Sequestration Partnership (SECARB). This DOE-funded activity seeks to demonstrate the technology for permanent underground sequestration of CO<sub>2</sub>. The company continues to work with SECARB to identify other sites in the Southeast for geologic carbon sequestration.

Southern Company also is a leader in FutureGen, a \$1 billion public-private partnership that is planning the demonstration of a 275-MW coal-gasification-based power plant with CO<sub>2</sub> capture and sequestration by 2012. The company believes that FutureGen is a platform from which many of the needed advances in dealing with carbon dioxide emissions from coal-fueled power generation will be developed, tested, and made ready for wider commercial use.



## Conclusion

Climate change is a challenging issue for our world and our nation. Southern Company is committed to a leadership role in finding solutions that make technological, environmental, and economic sense. The focus of this effort must be on developing and deploying technologies that reduce greenhouse gases while making sure that electricity remains reliable and affordable. Southern Company believes that this is the most responsible approach to meeting the needs of the environment and its customers and shareholders.



## EEI Global Climate Change Principles

### BACKGROUND

EEI's member companies clearly recognize the growing concerns regarding the threat of climate change. Since 1994 – when EEI joined the U.S. Department of Energy in the Climate Challenge – the electric utility industry has led all other industrial sectors in reducing greenhouse gas emissions. Through various programs now under way including Power Partners<sup>sm</sup>, the Asia-Pacific Partnership and individual company efforts – that commitment continues.

Today, EEI's members recognize a growing imperative to make even deeper reductions in greenhouse gas emissions. No matter what the ultimate path is, success in that mission – while maintaining the reliable and reasonably priced electricity supply so vital to our economic well-being and national security – will require an aggressive and sustained commitment by the industry and policymakers to the development and deployment of a full suite of technology options, including:

- An intensified national commitment to energy efficiency, including advanced efficiency technologies and new regulatory and business models;
- Accelerated development and cost-effective deployment of demand-side management technologies and renewable energy resources;
- Advanced clean coal technologies (e.g. advanced pulverized coal, fluidized bed and IGCC technologies);
- Carbon capture and storage for all types of fossil-based generation;
- Increased nuclear capacity and advanced nuclear designs; and,
- Plug-in electric hybrid vehicles.

Although some of these options are currently available – albeit at a higher cost than conventional generation sources – many are not. All have different time horizons, but all are critical to our dual goals of addressing greenhouse gas emissions and maintaining a reliable, affordable electricity supply in a carbon-constrained world. Moreover, because of the global nature of the problem, solutions will require the participation of the entire world economy, including China and India.

### PUBLIC POLICY PRINCIPLES

EEI will continue to emphasize the importance of:

- A reliable, stable and reasonably-priced electric supply to maintain the competitiveness of the U.S. economy;
- A fuel-diverse generation portfolio to assure system reliability, energy security and price stability;
- Public policies and initiatives to accelerate the development of viable and cost-effective energy efficiency programs and technologies; zero- or low-emissions generation technologies; and carbon capture and storage technologies;
- International partnerships to address climate change as a global issue that requires global solutions, including appropriate participation by developing nations, such as China and India; and,
- Solutions compatible with a market economy that deliver timely and reasonably priced greenhouse gas reductions.

EEI supports federal action or legislation to reduce greenhouse gas emissions that:

- Involves all sectors of the economy, and all sources of GHG;
- Assures stable, long-term public/private funding to support the development and deployment of needed technology solutions;
- Assures compliance timelines consistent with the expected development and deployment timelines of needed technologies;
- Employs market mechanisms to secure cost-effective GHG reductions, and provides a reasonable transition and an effective economic safety valve;
- Establishes a long-term price signal for carbon that is moderate, does not harm the economic competitiveness of U.S. industry and stimulates future investments in zero- or low-carbon technologies and processes;
- Addresses regulatory or economic barriers to the use of carbon capture and storage and increased nuclear, wind or other zero- or low-GHG technologies;
- Minimizes economic disruptions or disproportionate impacts;
- Recognizes early actions/investments made to mitigate greenhouse gas emissions;
- Provides for the robust use of a broad range of domestic and international GHG offsets;
- Provides certainty and a consistent national policy; and,
- Recognizes the international dimensions of the challenge and facilitates technology transfer.

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