

Select Committee on Energy Independence & Global Warming Hearing on Renewable Electricity Standards, September 20, 2007

Testimony of Chris M. Hobson,

Senior Vice President, Research and Environmental Affairs

My name is Chris Hobson and I am Senior Vice President, Research and Environmental Affairs, for Southern Company. In this position I am responsible for environmental issues, as well as for the development of technologies that support the generation, transmission, distribution and end-use of electric energy. I am testifying today concerning Southern Company's experience with and outlook for renewable energy options in the Southeastern United States. I will also address Southern Company's experience with State renewable energy programs and our views on a federal renewable portfolio standard.

Southern Company is a vertically integrated utility system serving both regulated and competitive markets across the southeastern United States. Through our four independent operating companies — Alabama Power, Georgia Power, Gulf Power and Mississippi Power — we serve more than 4.3 million electric customers. Through our Southern Power subsidiary we also provide wholesale competitive power to customers in our service area as well as other parts of the Southeast.

In serving this retail and wholesale load we operate a diverse supply of electric generation facilities. Around 70% of our electric energy is generated with coal, 15% is from nuclear power, 11% from natural gas and the remaining 3% from hydropower. We are working continuously to enhance and improve our capability to meet the ever growing demand for energy in our region. The U.S. Census Bureau estimates that by 2030 some 40% of the population of the U.S. will live in the Southeast and they will need reliable and affordable energy to grow and prosper. We estimate that we will need to add 15,000 megawatts of additional electric generating capacity by 2025 to meet that growth. We are working to meet that capacity need with the addition of new nuclear capacity and the development and construction of advanced coal generation. We are in the licensing process of adding two additional nuclear generating units at our Plant Vogtle site near Waynesboro, Georgia which should come on line in 2015 and 2016. Also on September 10 of this year we broke ground in Orlando, Florida for the construction of a new integrated coal gasification combined cycle facility to provide power to the Orlando Utilities Commission. These new advanced technologies along with natural gas generation, renewable energy and energy efficiency and conservation will be needed to meet the ever increasing demands for electric power in the Southeast and around the world.

While meeting these future energy challenges we are also expending a tremendous amount of resources to minimize the environmental impact from our existing fleet of power plants. Since 1990 we have spent some \$2 billion on equipment to reduce emissions from our coal-fired plants and over the next three years we will spend another \$4.6 billion to reduce the emissions of sulfur dioxide, nitrogen oxides and mercury even further.

Southern Company Efforts to Promote the Use of Renewable Energy

We believe that renewable resources have a role to play in meeting the increasing demand for energy. Even with limitations on the availability of wind and solar in the southeastern U.S. we believe that progress can be made in increasing the use of renewables in our energy mix and we are committed to such a goal. For example we operate 3,400 MW of hydro-electric capacity in Alabama and Georgia which provides some 3% of our customer's needs. This renewable resource provides a low cost means of energy storage that helps us meet peak demands on our system.

Biomass. Biomass, whether derived from agricultural crops or wood, has the highest potential for providing renewable electricity generation in the Southeast. Switchgrass is a hardy, highly productive prairie grass that has potential as a renewable energy fuel. We have conducted co-firing tests of switchgrass with coal since 2001. We are also working with the National Forest Service in a project to test the feasibility of using small diameter wood available from forest thinning activities for blending with coal in a coal-fired boiler. Co-firing tests are scheduled for late 2007. There are challenges with biomass blending approaches, as material handling issues and the loss of heating value impose limitations on the amount of biomass that can be co-fired with coal. Further research and tests are under way however.

The next step in investigating the use of biomass for power generation is examining the feasibility of repowering existing coal units or building new units to utilize biomass for 100% of the generation as compared to co-firing. We are working with the Electric Power Research Institute to define capital costs, operating and maintenance requirements and commercially available options for converting small generating units from coal to 100 percent biomass. Challenges to this approach include the significant de-rating of the unit when converted from coal to biomass (it is estimated that biomass will only produce one-half the power that a unit fired with coal would produce) and the economic, environmental and logistical issues associated with transporting biomass over long distances for use in a generating facility.

Wind. As shown in Figure 1, National Renewable Energy Laboratory (NREL) studies show that the presence of commercially available wind resources in the southeastern U.S. is severely limited. This is especially true for on-shore resources. Southern Company has investigated the amount of commercially viable wind off-shore the coast of Georgia. We partnered with Georgia Tech to conduct a study to examine the feasibility of generating electricity from wind off the Georgia coast. Results of the study show that although there are potentially viable winds some 5 miles off the coast the commercial application is limited due to the low wind speeds during the summer months when the electricity need is greatest, the high construction cost in off-shore environments and the fact that wind turbines are not guaranteed to survive even a minimal Class 3 hurricane.

Mountain ridge-top locations are remote, requiring incremental costs for developing access roads and power transmission infrastructure. Moreover, the hilly terrain increases the complexity of installation and the overall costs of wind energy due to variations in wind flows observed in mountainous regions compared to flatter landscapes. This variation is depicted in Figure 2,

below which illustrates the variable directional wind flow that can exist in mountainous areas. This variation tends to decrease the amount of usable energy that can be extracted from the wind, resulting in lower capacity factors. Reduced capacity factors increase overall cost per kilowatt-hour of energy generated.

These factors taken together lead us to conclude that wind resources in the Southeast, unlike other areas of the country, are limited, costly and not of sufficient quality to support large amounts of utility-scale wind generation.

We will continue to pursue the potential development of wind energy resources in off-shore coastal waters. There will have to be large advances in the development of lower-speed and hurricane tolerant wind turbine designs. Even with technical advances the still limited available wind in the Southeast as well as the intermittent nature of wind energy make the potential contribution of wind to meeting the energy needs of our customers will be low.

Solar. Southern Company has evaluated numerous solar options over the past 20 years including operation of thermal solar collectors, solar dish/stirling technology and photovoltaic arrays. There are severe limitations in the amount of solar energy available in the Southeast however. Figure 3 is a Department of Energy map showing the much lower amount of solar available in the Southeast as compared to other regions of the U.S. Key challenges are the very low availability of solar power during a 24 hour period and the extremely high costs per kilowatt hour compared to other sources of electricity. Tests have indicated that solar will only provide power about 15% of a 24 hour period, requiring some other power source during the remaining 85% of the time. Also current cost estimates for solar are over 25 cents/Kwh as compared to the average 7-8 cents/Kwh for our residential customers. Future technology developments might bring this cost down somewhat but it is unlikely to ever reach the same costs as other power options.

Landfill Gas. The capture of methane from municipal landfills is a source of renewable energy that we have tapped. In 2006 Southern Company subsidiary Georgia Power began working with a local landfill in DeKalb County to produce power from methane capture. Some 2.5 megawatts can be produced from this landfill project. Other applications are being examined although the total amount will be limited by the number and age of landfills.

Renewable Portfolio Standards in the Southeast

None of the four States in Southern Company's service area currently have renewable portfolio standards. This has been limited by the low availability of renewable resources in the region as compared to other parts of the nation. The State of Florida is currently evaluating adopting an RPS program as proposed by Governor Charlie Crist. Southern Company subsidiary Gulf Power Company is working with the Florida Public Service Commission during its hearing process on an RPS to advance ideas that make sense for the State and its electric customers. This is consistent with letting States take the lead on developing renewable energy programs that can be tailored to circumstances particular to that State and its resources, cost of energy and customer needs.

Opportunities to Develop and Deploy Renewable Technologies in the Future

We continue to assess renewable power technologies available to augment and expand our generation portfolio. Figure 3 shows a wide range of renewables research and development projects under way across the Southeast. Even with the limitations of renewable resources in the southeastern U.S. especially wind and solar, we are committed to expanding the use of renewables in ways that can continue our history of providing reliable, affordable and clean energy for our growing customer base.

Implications of a Federal Renewable Portfolio Standard

Against this backdrop of the renewable resources available, we are concerned about mandates that would require us to utilize fixed amounts of renewable resources for electricity generation. Southern Company opposes a nationwide renewable energy mandate. We believe that mandates are an inefficient and potentially counterproductive means of increasing the production of cost-effective, reliable electric power from renewable sources. We prefer to seek cost-effective additions to our generation portfolio based on technological maturity, technical performance, reliability and economic cost.

The current strategy of providing incentives for the development of cost effective, reliable renewable resources that recognizes variations in the regional availability of such resources is the better approach and should be continued and enhanced. In our experience, the best way to increase production of renewable energy is through prudent investment in available resources and related research and development. Proposed Federal mandates would result in a diversion of massive amounts of financial resources to compliance payments, reducing resources available to spend on renewable energy, energy efficiency, and other clean energy resources.

A nationwide, Federal mandate similar to the “one size fits all” renewable energy standard recently adopted by the House of Representatives would penalize resource-poor regions and require the payment of billions of dollars to either renewable companies in other regions or more likely to the Federal government. The House-passed proposal would require 15% of retail sales to be from renewable by 2020, with an alternative compliance payment option of 3 cents per kilowatt hour payable to the Department of Energy. The House definition limits the definition of renewable to wind, solar, biomass, geothermal, ocean, tidal, landfill gas, and incremental hydropower. Partial credit may be allowed for certain energy efficiency measures, but only upon petition by a State governor. It is not clear how energy efficiency would be calculated, particularly in later years after the available opportunities for energy efficiency improvements have already been made.

Our estimates show that a 15% Federal renewable energy mandate would far exceed the available renewable resources in the Southeastern region. To replace 15% of the nation’s retail energy by 2020 would require approximately 80,000 wind turbines of 2 megawatt capacity each, or 2,200 square miles of land (*i.e.*, an area larger than Delaware) for solar photovoltaic arrays, or 87,000 square miles of switchgrass fields (*i.e.*, an area the size of Minnesota). To replace 15% of just Southern Company’s retail energy by 2020 would require approximately 6,900 wind

turbines of 2 MW capacity each, or 200 square miles of land for solar photovoltaic's, or 6,000 square miles of switchgrass fields (*i.e.*, an area the size of Connecticut).

The renewable energy potential of the Southeast falls far short of a 15% requirement. Figure 4 shows that there is very little wind power generation potential in the Southeast. The most wind-rich areas of the Southeast are in scenic and environmentally sensitive areas, such as the mountaintops of the lower Appalachian Mountains and the Gulf and Atlantic coast areas. Figure 5 shows a similar lack of solar intensity in the Southeast. Figure 6 shows Southern Company's projected maximum potential renewable capacity through 2029. The total renewable capacity is not expected to exceed 800 to 1,000 megawatts in the years 2026-2029, including all renewable sources (other than existing hydropower). Even with such an enormous increase, Figure 7 shows that level of renewables would produce less than one-sixth of the approximately 6,000 megawatts of renewable energy required under a 15% mandate.

The House-passed language allows for no flexibility in the definition of renewable energy. Although the House bill allows credit for payments made under existing State programs, the amount of credit is tied to actual amounts of energy produced from renewable resources as defined from the program, not to the amount of the payment under the State program. Figure 8 shows the diversity of resources allowed under existing State RPS mandates. The House language would not allow credit for many of these regionally abundant resources. It is significant to note that not one of these existing State programs is consistent with the RPS language adopted by the House. Utilities in each of these States will have different and often conflicting requirements for both their State as well as the federal program requirements.

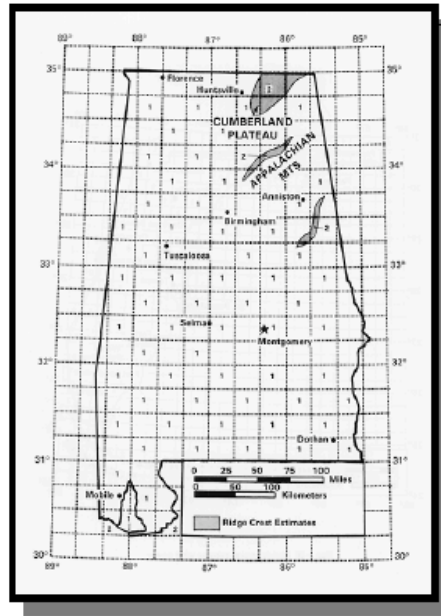
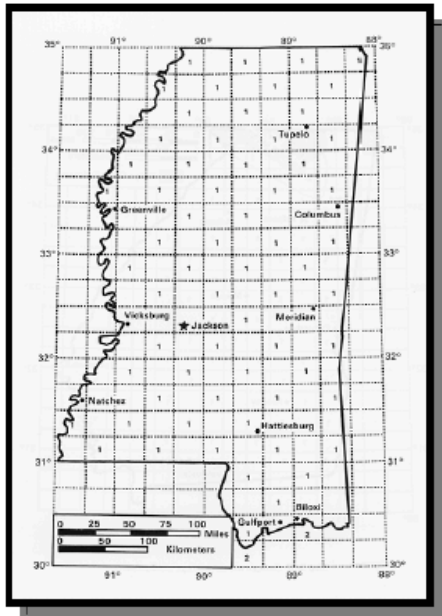
Because the renewable resources that would be required to comply with a 15% mandate are not available in the Southeast, Southern Company would be required to comply largely by making alternative compliance payments to the Federal government. Figure 9 shows the projected cost to Southern Company of a 15% by 2020 mandate with alternative compliance payments at 3 cents per kilowatt hour, as adopted by the House. This shows that our customers would be paying over \$ 1 billion per year when the RPS requirements reach the 15% level and the cumulative cost to our customers through 2030 of such a requirement would total over \$19 billion in nominal dollars. Because of the limited availability of renewable resources in our region and the fact that most of what is available will likely be more expensive than the 3 cents/Kwh price cap the majority of that \$19 billion cost to our customers will simply be payments to the federal government. Thus a nationwide RPS mandate could cost electricity consumers in the Southeast billions of dollars in higher electricity prices, with no guarantee that additional renewable generation will actually be developed.

It is clear that efforts to increase the use of renewable resources for electricity production must recognize State and regional variations in resource availability, the intermittent nature of renewables and the challenge of producing and transmitting renewable energy in a way that protects the reliability and affordability of electric energy to customers. A federal "one-size-fits-all" mandate works against those goals and therefore the current strategy of providing incentives for the development and use of renewable energy should be maintained and enhanced.

Conclusion

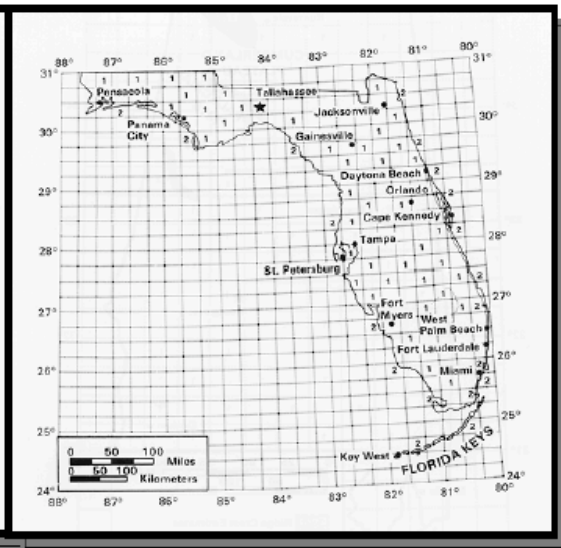
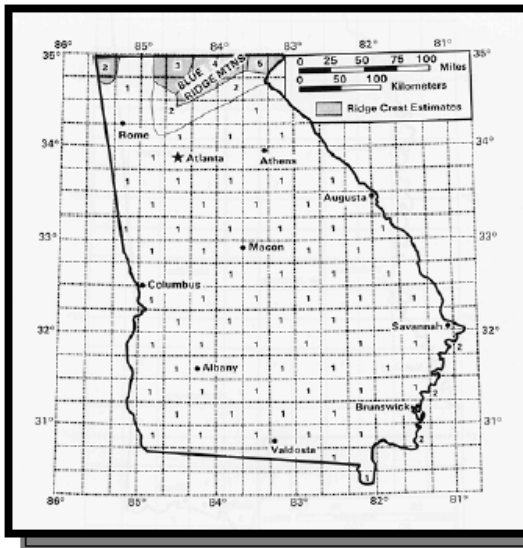
Southern Company has a long history of the utilization of renewable energy. We continually assess our generation options — including renewable resources — to provide low-cost, reliable energy to meet the growing demands for electric power in our region. Not every technology will be well-suited to every region of the country. We do believe that the use of renewable energy to produce electricity can be increased and we intend to play a key role in the research and development needed to reach such an objective. This is best reached by the enhancement of current strategies to provide incentives for the R&D as well as the use of renewable energy as compared to the adoption of a federal mandate for a single standard across the country. We will continue to work to facilitate generation technology options — including renewable energy — that ensures a reliable, affordable and environmentally sound supply of energy to meet the growing demands for electric power in the southeastern U.S.

Wind Generation Potential in Southern's Territory Mostly Class 1 Winds



Source: Internet @ http://redc.nrel.gov/wind/pubs/atlas/atlas_index.html

Wind Generation Potential in Southern's Territory Mostly Class 1 Winds



Source: Internet @ http://redc.nrel.gov/wind/pubs/atlas/atlas_index.html

Fig.1

Wind Generation Costs Dependent on Nature of Wind Resource
Need Class 4 or Higher for Economical Generation

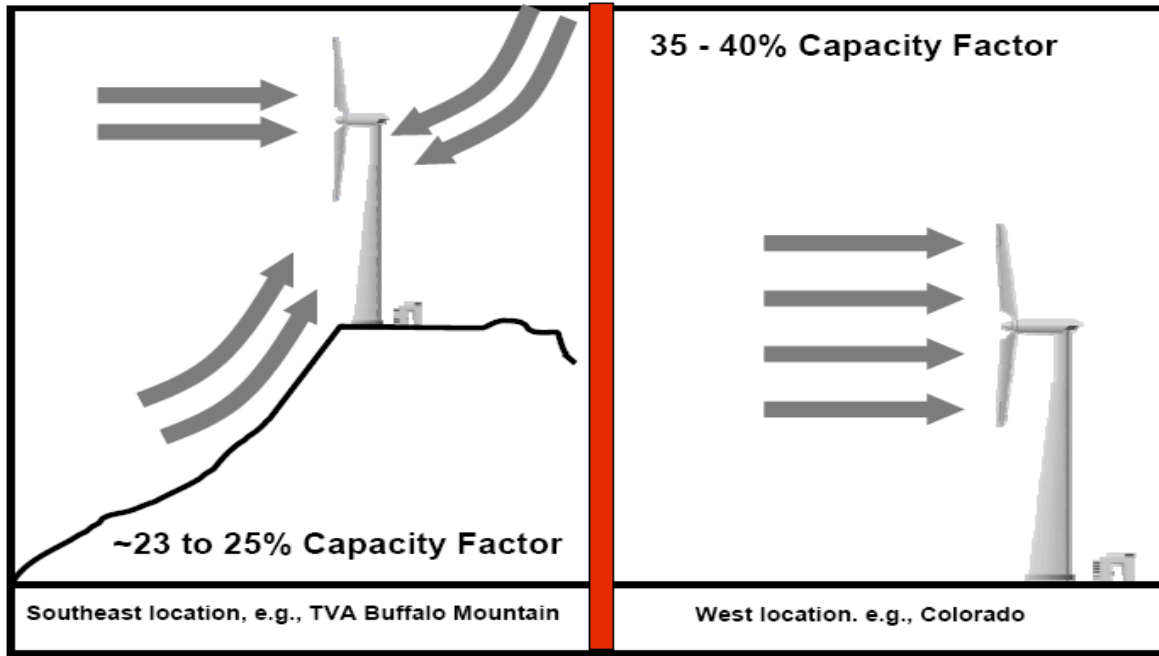


Fig.2

Renewable Power R&D Projects

Southern Company

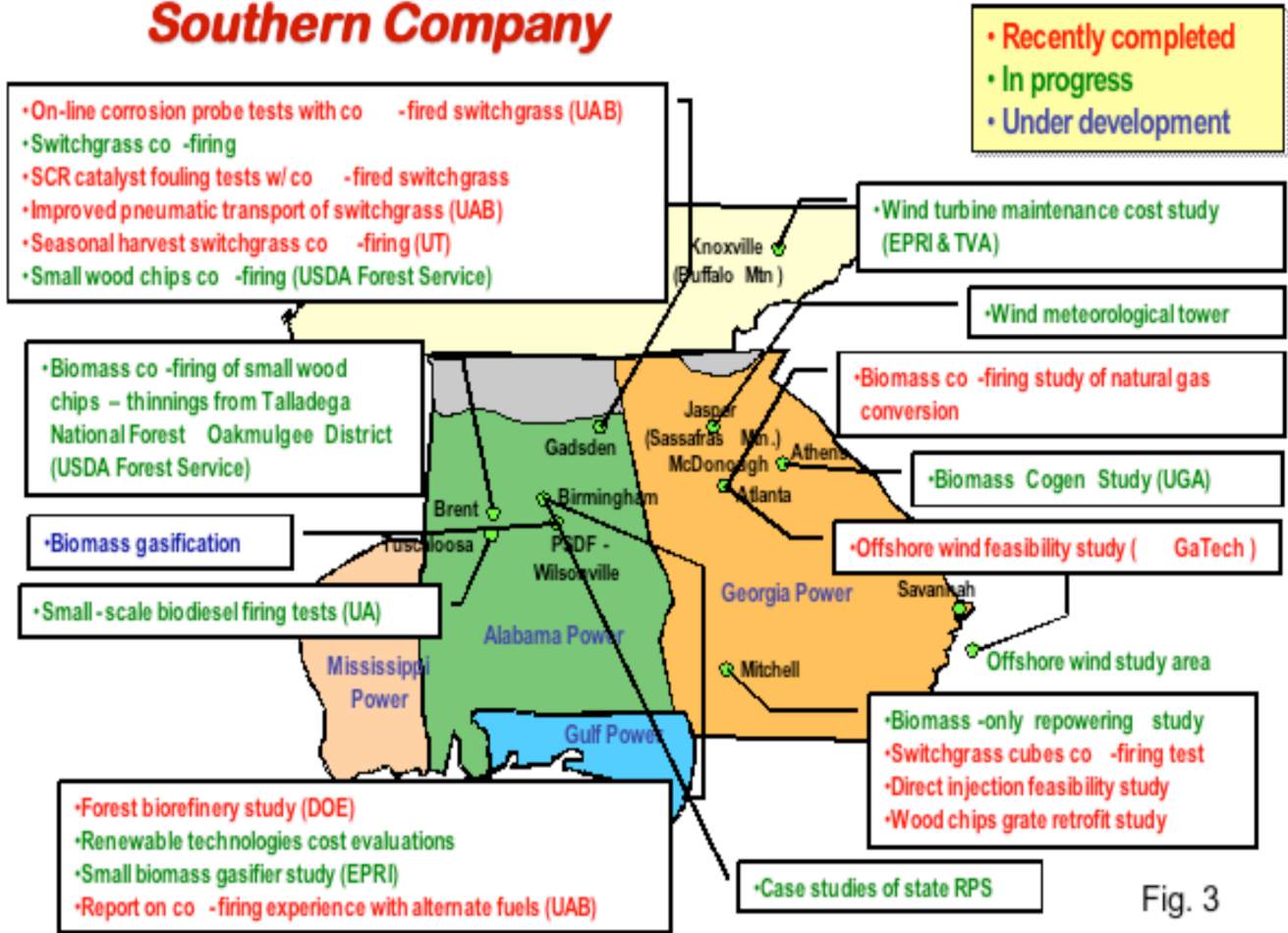
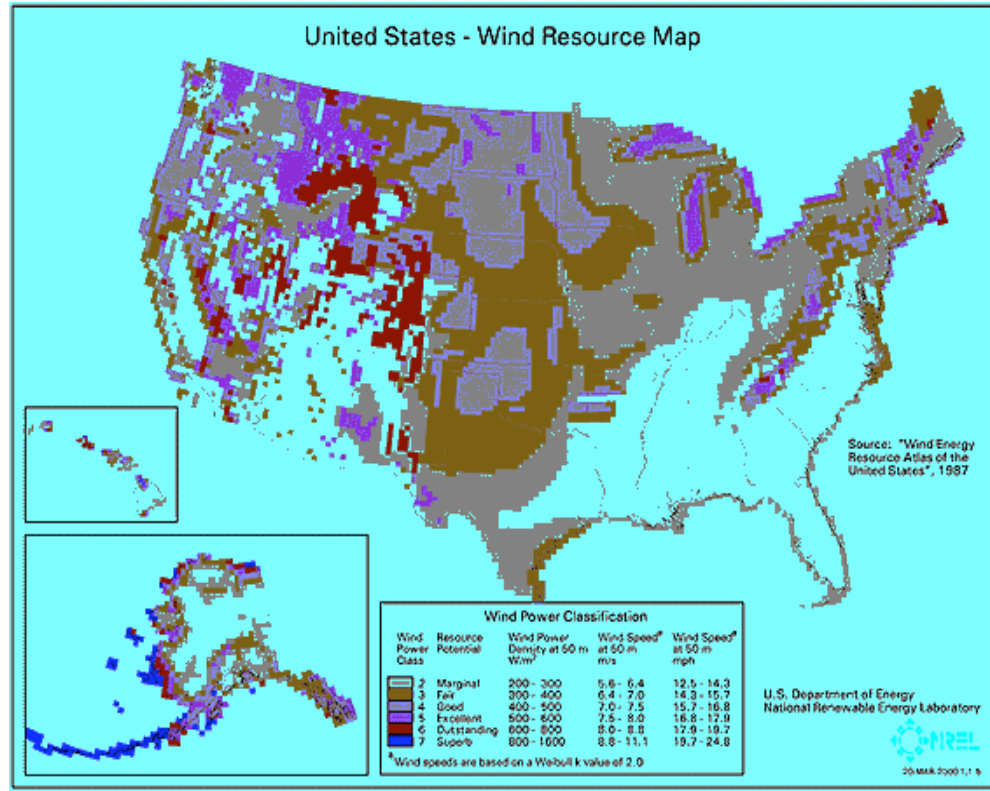


Fig. 3

Wind Power Generation Potential

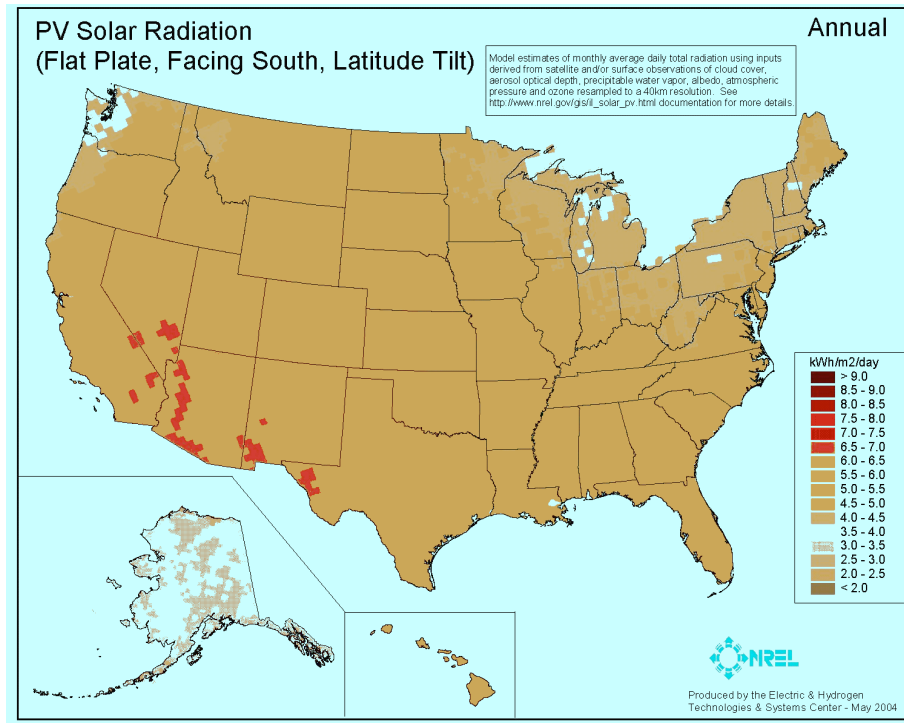
Wind Potential Rated from Class 1 to 7



Source: National Renewable Energy Laboratory

Fig. 4

Solar Intensity: United States



Source: National Renewable Energy Laboratory

Fig. 5

RPS Impact on Southern Company

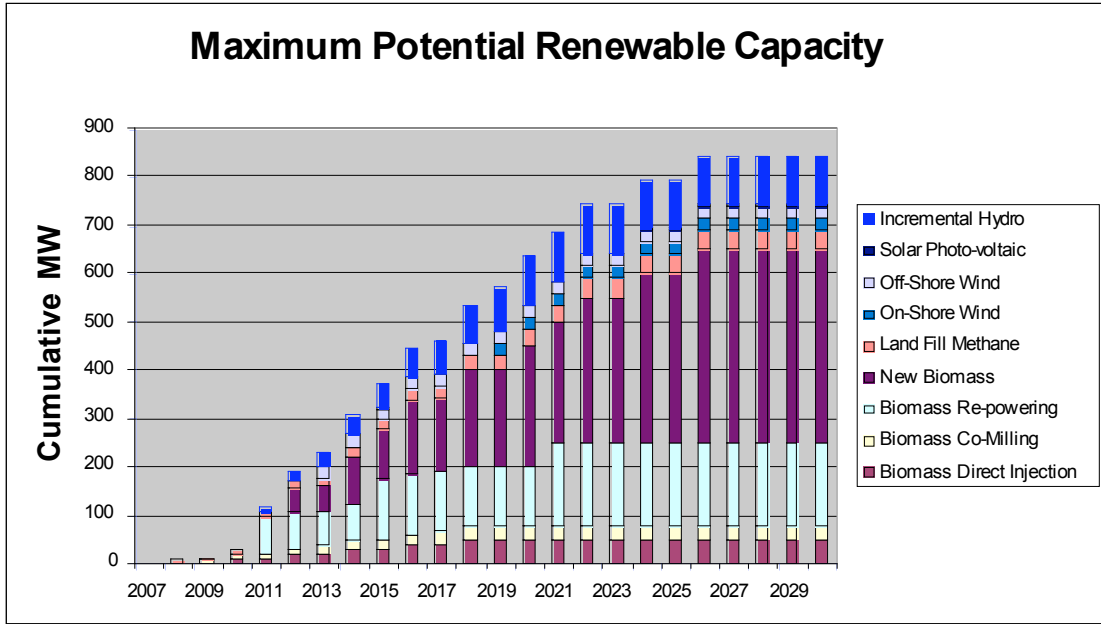


Fig. 6

Max. Potential Renewable Capacity for Southern Company vs. 15% Mandate

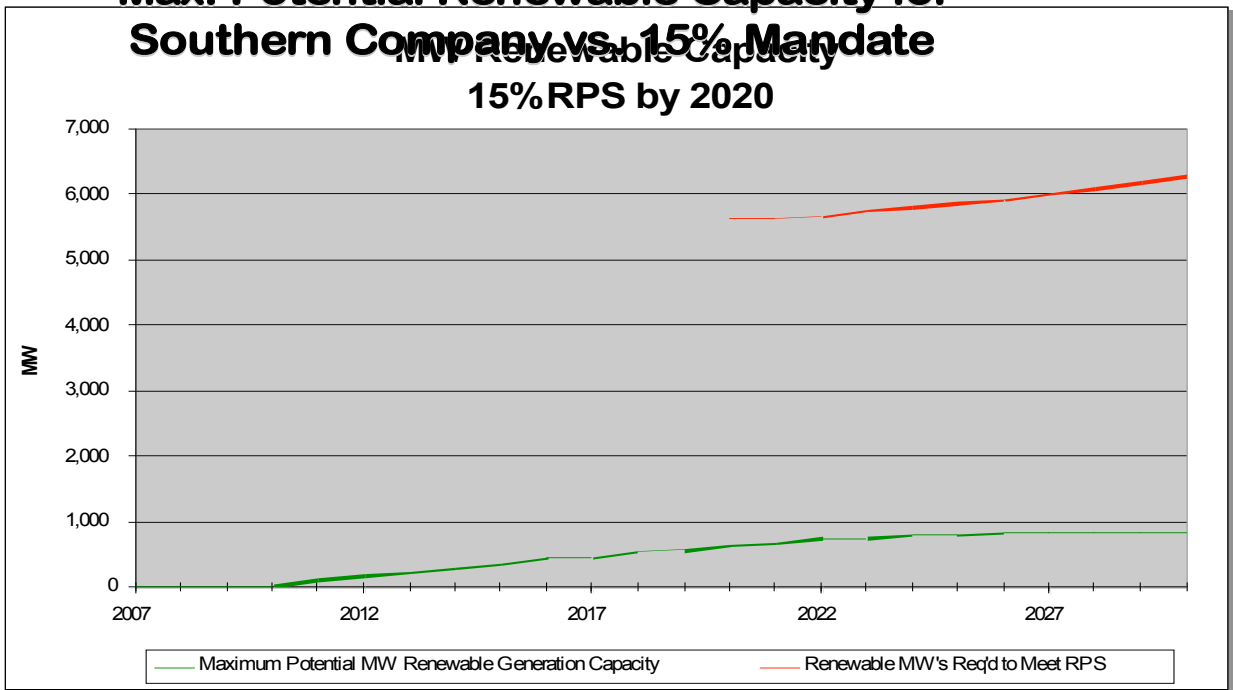


Fig. 7

Comparison of Eligible Resources in Bingaman RPS Proposal and Existing State RPS Mandates

This chart compares the eligible resources that qualify under the federal RPS amendment circulated by Chairman Bingaman in April 2007 which would mandate 15% renewables by 2020, and the existing RPS programs in 24 states and the District of Columbia.

| Federal RPS | Wind | Solar | Biomass | Landfill Gas | Geothermal | Ocean, Current, Wave or Tidal | Hydro (small, geothermal, or microhydro) | Fuel Cells (other eligible resources) | MSW/WTE/Res. Recovery | Biomass | Ocean Thermal | Waste Water Treatment Gas | Bio-derived liquid fuel | Dist. Gas (eligible resources) | Energy Efficiency | On-site solar heating or AC | PT/PEA QDs | Demand Response | Demand Side Management | Efficient Cogeneration | IGCC | Load shifting | Mini-Methane | Pumped Storage | Storage from coal water based pump | Waste Coal | Waste Heat | Intermittible Load | Total Eligible Resources Listed | Net Difference (State vs Federal) |
|-------------|------|-------|---------|--------------|------------|-------------------------------|------------------------------------------|---------------------------------------|-----------------------|---------|---------------|---------------------------|-------------------------|--------------------------------|-------------------|-----------------------------|------------|-----------------|------------------------|------------------------|------|---------------|--------------|----------------|------------------------------------|------------|------------|--------------------|---------------------------------|-----------------------------------|
| Federal RPS | x | x | x | x | x | x | x | | | | | | | | | | | | | | | | | | | | | 7 | - | |
| AZ | x | x | x | x | x | | | | | | | | | | | | | | | | | | | | | | | | 9 | +2 |
| CA | x | x | x | x | x | x | x | | | | | | | | | | | | | | | | | | | | | | 11 | +4 |
| CO | x | x | x | x | x | | | | | | | | | | | | | | | | | | | | | | | | 11 | +4 |
| CT | x | x | x | x | | | | | | | | | | | | | | | | | | | | | | | | | 14 | +7 |
| DC | x | x | x | x | x | x | x | | | | | | | | | | | | | | | | | | | | | | 11 | +4 |
| DE | x | x | x | x | x | x | x | | | | | | | | | | | | | | | | | | | | | | 9 | +2 |
| HI | x | x | x | x | x | x | x | | | | | | | | | | | | | | | | | | | | | | 19 | +12 |
| LA | x | x | x | | | | | | | | | | | | | | | | | | | | | | | | | | 6 | -1 |
| MA | x | x | x | x | | | | | | | | | | | | | | | | | | | | | | | | | 10 | +3 |
| MD | x | x | x | x | x | x | x | | | | | | | | | | | | | | | | | | | | | | 12 | +5 |
| ME | x | x | x | x | x | x | x | | | | | | | | | | | | | | | | | | | | | | 13 | +6 |
| MN | x | | x | | | | | | | | | | | | | | | | | | | | | | | | | | 4 | -3 |
| MT | x | x | x | x | x | | | | | | | | | | | | | | | | | | | | | | | | 10 | +3 |
| NH | x | x | x | x | x | x | x | | | | | | | | | | | | | | | | | | | | | | 13 | +6 |
| NJ | x | x | x | x | x | x | x | | | | | | | | | | | | | | | | | | | | | | 12 | +5 |
| NM | x | x | x | x | x | x | x | | | | | | | | | | | | | | | | | | | | | | 8 | +1 |
| NV | x | x | x | x | x | | | | | | | | | | | | | | | | | | | | | | | | 11 | +4 |
| NY | x | x | x | x | | | | | | | | | | | | | | | | | | | | | | | | | 12 | +5 |
| OR | x | x | x | x | x | x | x | | | | | | | | | | | | | | | | | | | | | | 14 | +7 |
| PA | x | x | x | x | x | | | | | | | | | | | | | | | | | | | | | | | | 20 | +13 |
| RI | x | x | x | x | x | x | x | | | | | | | | | | | | | | | | | | | | | | 12 | +5 |
| TX | x | x | x | x | x | x | x | | | | | | | | | | | | | | | | | | | | | | 9 | +2 |
| VT | x | x | x | x | x | | | | | | | | | | | | | | | | | | | | | | | | 12 | +5 |
| WA | x | x | x | x | x | x | x | | | | | | | | | | | | | | | | | | | | | | 9 | +2 |
| WI | x | x | x | x | x | x | x | | | | | | | | | | | | | | | | | | | | | | 8 | +1 |

Source: Edison Electric Institute (EEI)
As of 6/12/07

Fig. 8

Renewable Portfolio Standard 15 Percent @3 Cent/ Kwh Price Cap Cost to Southern Company

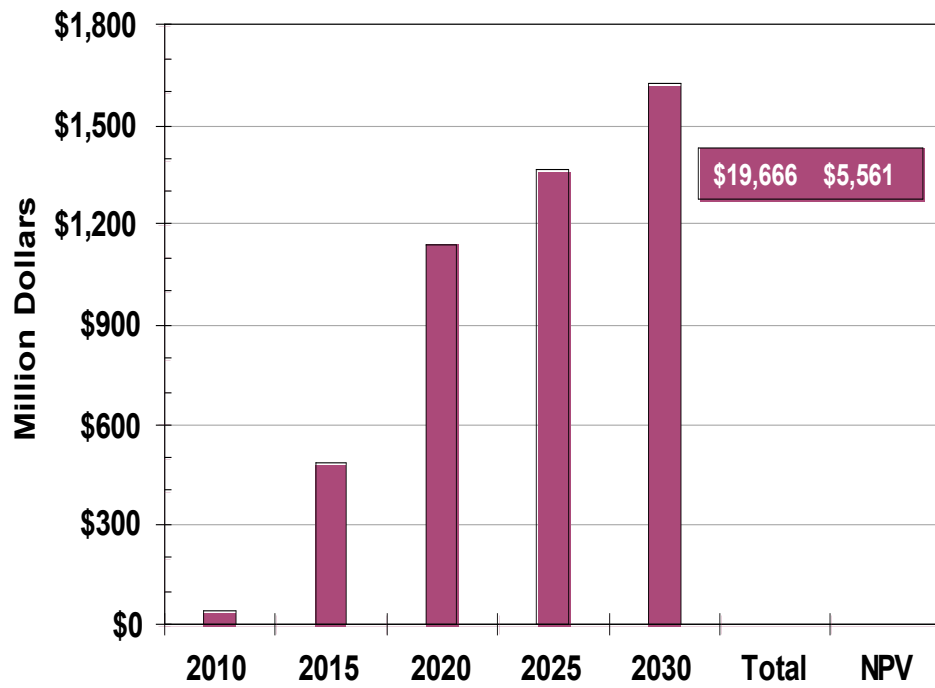


Fig. 9