



How Southern Company has increased reliability and resilience using **AMI and DER**

Smart Grid and Climate Change

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Southern Company



- One of the largest electric utilities in the U.S.
- 4.4 million customers
- 46,000 MWs of generation



Vertical Integration/Integrated Resource Planning



- Best combination of demand side, generation, transmission
 - Total life cycle cost – price impact to customers
 - Firm physical transmission delivery service
 - Firm fuel transportation or fuel storage
 - Diversity of: fuel type, fuel supply basin and fuel transportation
- Integration
 - Planners (generation, transmission, demand side, fuel)
 - Operations (generation fleet, fuel, transmission, demand side)
- Cost-based economic dispatch of owned and contracted resources
- Results: clean, safe, reliable and affordable energy

Southern Company Actions

Customers at center of business model

- High Reliability
- Low Price
- High Customer Satisfaction

The Full Portfolio

- Nuclear
- 21st Century Coal
- Natural Gas
- Renewables
- Energy Efficiency



Example Southern Company Actions that Improve Reliability and Resilience



- Fleet/fuel/basin/transportation diversity
- Firm fuel transportation or on site fuel storage
- Demand Response such as
 - Distribution voltage control
 - Energy Select
 - Interruptible
 - Real time pricing
- Advanced Metering

Clean Power Plan



- National energy policy is responsibility of Congress and the states, which have lens to balance utilities' responsibility to provide clean, safe, reliable and affordable power
- Overreaching rule directly impacts national energy policy and impedes states' authority to act in the best interests of customers

EPA Modeling



- EPA predicts Southern's compliance approach as a combination of actions
 - Retirement of specific coal-fired units
 - Increased use of existing natural gas combined-cycle units
 - Addition of new natural gas units and solar PV generation
 - Additional demand-side energy efficiency

Example System Impacts of High Solar Penetration



- Benefits: avoided fuel, VO&M, compliance, deferred capacity and FO&M
- Costs: generation mix, regulating reserves, operating reserves, bottom out, maintenance, local or area voltage stabilization, etc.

Example CPP Reliability Risks



- Long infrastructure lead times
- High capacity factor gas vs. high penetration of intermittent renewables

Summary



- Driven by what is best for our customers
- Objective of planning process: clean, safe, reliable and affordable energy