



Southern Company

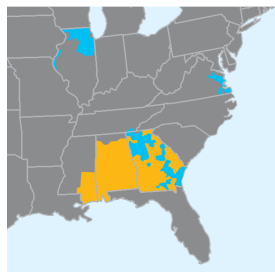
Energy for Life - Our Grid of the Future

Nicole Faulk
Vice President of Corporate Services

2019 CIGRE Grid of the Future Conference
November 5, 2019



We provide clean, safe, reliable, affordable energy and customized solutions



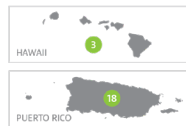
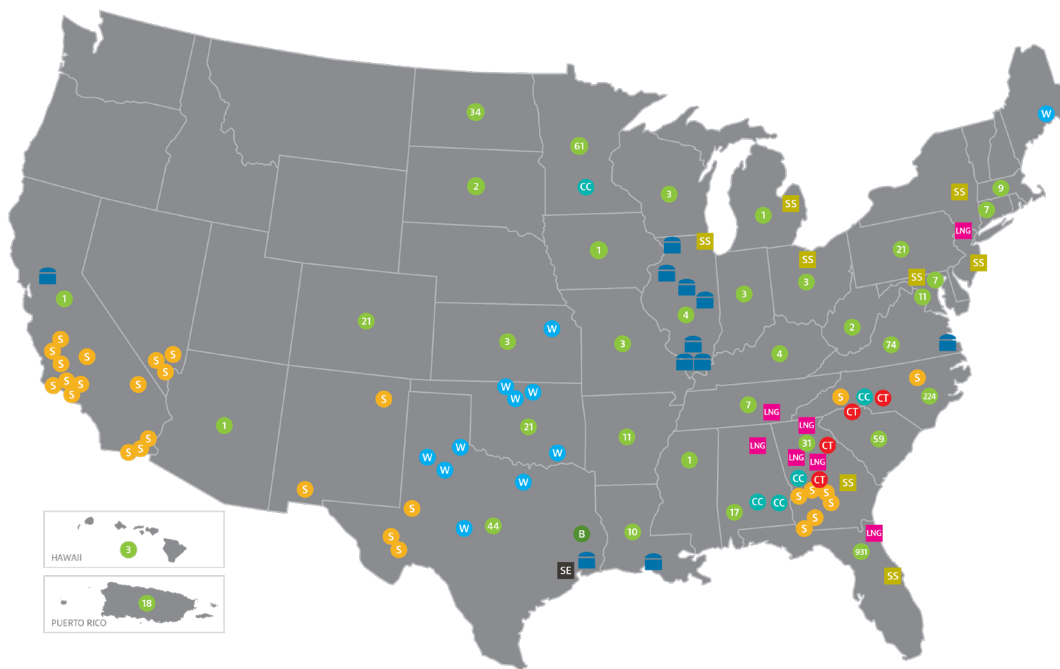
Service territories

- Electric
- Gas



Gas pipelines

- Southern Natural Gas
- Southern Company Gas
- Pipeline projects



- | | | |
|--|--|--|
| Southern Power | Southern Company Gas | PowerSecure |
| ■ Combined-cycle facility ¹ | ■ LNG facilities | # Owned and managed sites per state |
| ■ Peaking facility | ■ Sequent Energy Management | |
| ■ Biomass facility | ■ SouthStar | |
| ■ Solar facility | ■ Natural gas storage | |
| ■ Wind facility | | |

Capabilities in
50 States

7
Electric & Natural
Gas Utilities

9 Million
Customers

Approximately
29,000
Employees

Approximately
44,000 MW
of Generating Capacity

¹In November 2018, Southern Power agreed to sell its combined-cycle facility in Mankato, Minnesota.

Energy for Life



State of the Grid – Past, Present and Future



PAST

- Central Generation, Transmission and Distribution networks
- Energy demand easily calculated and grid designed for known customer demand
- Natural disaster recovery expected to take days and weeks

PRESENT

- Digital economy = larger demand and reliance on electronics
- Increased energy efficiency drives down use per customer and load growth
- Distributed generation, customer demand for more control over usage, renewables
- Regular disasters show need for storm hardened and resilient grid

FUTURE

- Wide adoption of clean distributed energy
- Robust grid operated with intelligence
- Enhanced connectivity in front and behind the meter
- Balance of highly reliable service and new technologies at lowest possible cost
- Real-time updates on social media and mobile platforms during natural disasters and faster restoration than in the past



Hurricane Camille and Hurricane Katrina



HURRICANE CAMILLE AUGUST 17, 1969

- Category 5, 205 mph winds, 25 foot storm surge
- 85% of customers without power
- 174 transmission towers down
- 1,600 outside line crew and staff
- Power restored in 14 days

HURRICANE KATRINA AUGUST 29, 2005

- Category 4, 140 mph winds, 40 foot storm surge
- Every customer without power
- 300 transmission towers down
- 9,000 poles down
- More than 10,000 outside line crew and staff
- Plant Watson sustained extensive flood damage
- Power restored in 12 days

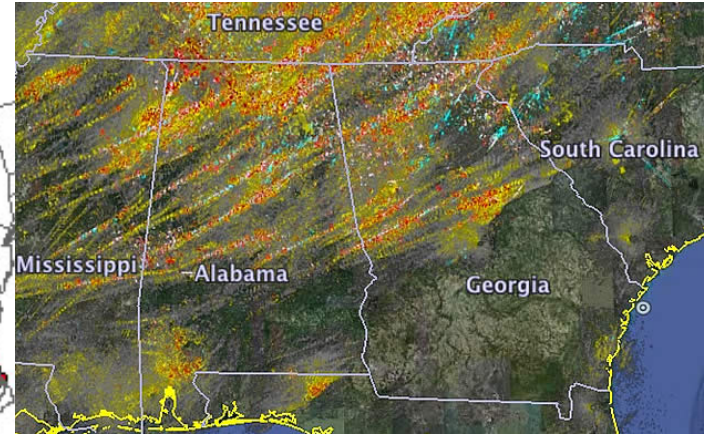
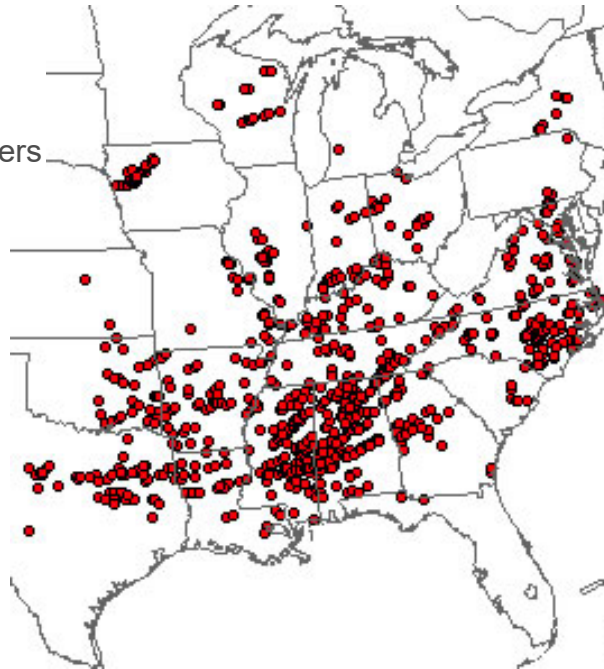
April's Fury 2011



Two-day storm spawned more than **312 tornadoes**

(April record was 148 tornadoes)

- 412,000+ Alabama Power Customers impacted
- More than 10,000 resources
- Power restored in 5 days



Hurricane Michael – Unprecedented System Response



Nearly 610K customers were impacted by Hurricane Michael:

89K



390K



130K



Power was restored to 95% of customers who could safely receive it within:

3 days



5 days



13 days



Hurricane Michael – Mutual Assistance by Numbers



- **20+** States provided assistance during Hurricane Michael restoration
- **3,750+** Gulf Power and native contractors worked in Southern Company footprint
- **7,600+** Outside resources brought into Southern Company footprint (including sister company resources)





Southern Company Strategy

- Unified approach to modernize the grid across Southern Company that improves how we transmit and distribute energy in the future
- Focused on:
 - » Resiliency and Reliability
 - » Grid Optimization and Innovation
 - » Tactical and Innovative Planning
 - » Improves how we transmit and distribute energy in the future
- Benefits all customers by maintaining or improving reliability and improving the customer experience



5 GAME CHANGERS for Power Delivery



1. AMI (Advanced Metering Infrastructure)



2. CBM (Condition-Based Maintenance)



3. SHN (Self-Healing Networks)



4. DER (Distributed Energy Resources)



5. Storm Hardening

Storm Hardening and Resiliency



Storm Hardening consists of two components:

- **Hardening** - physical changes to utility infrastructure to make it less susceptible to storm damage from events such as high winds, flooding and falling trees
- **Resiliency** - the ability to withstand and reduce the magnitude and/or duration of disruptive events, which includes the capability to anticipate, absorb, adapt to, and/or rapidly recover from such an event



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Innovation



Electric Transportation



A Southern Company Big Bet Since 1990 - What's Different Now?

Technology



Disruptors



Customer Demand



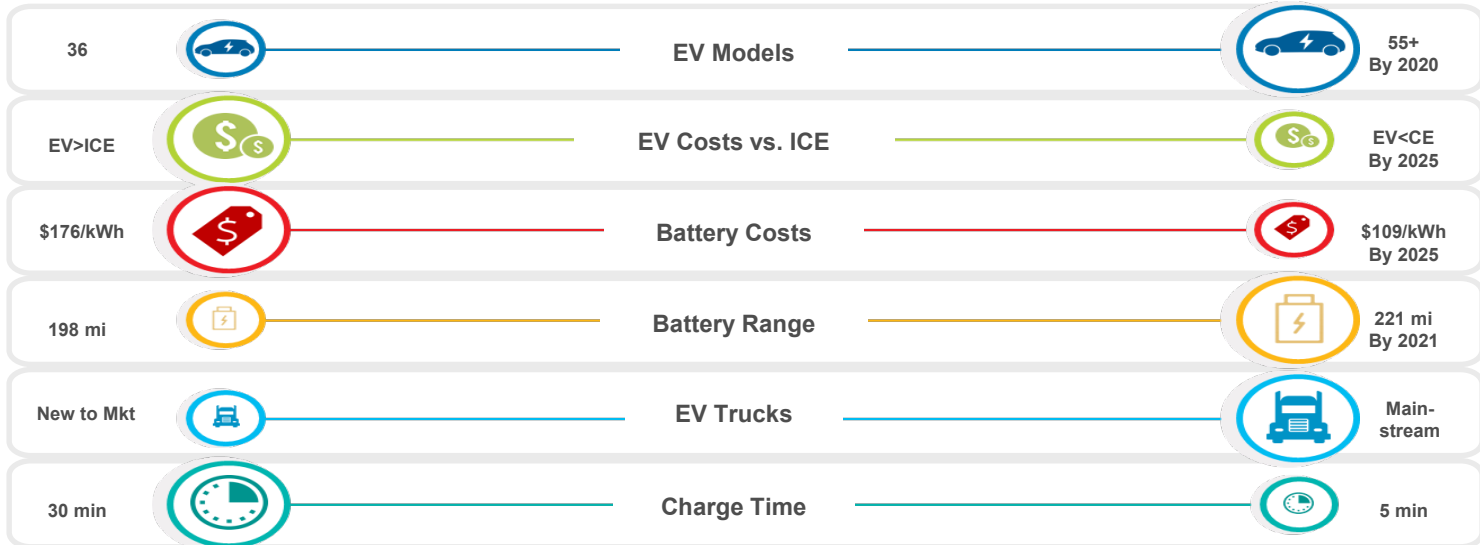
Investments



Key Players & Alliances



Today (2019)

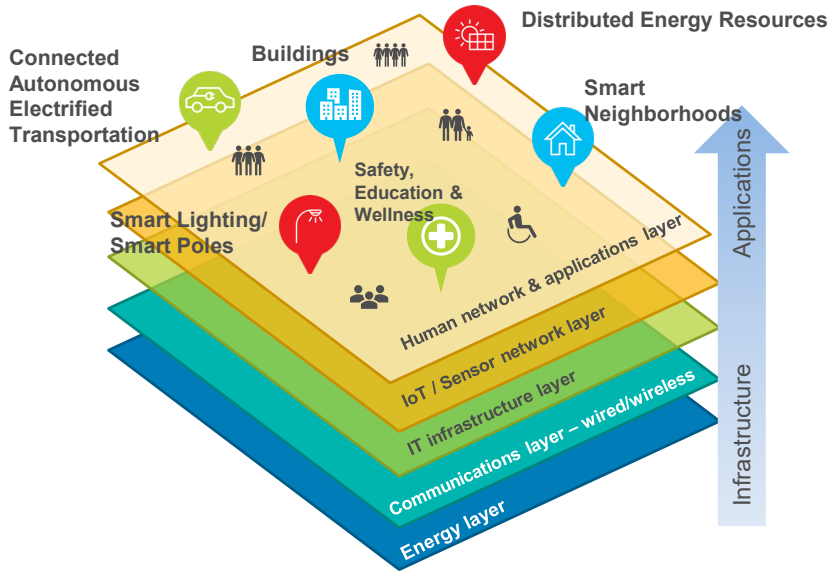


Tomorrow (2020-25)

Smart Cities



“Representative” Smart City



A critical foundation is energy and telecommunications.

A Smart City is

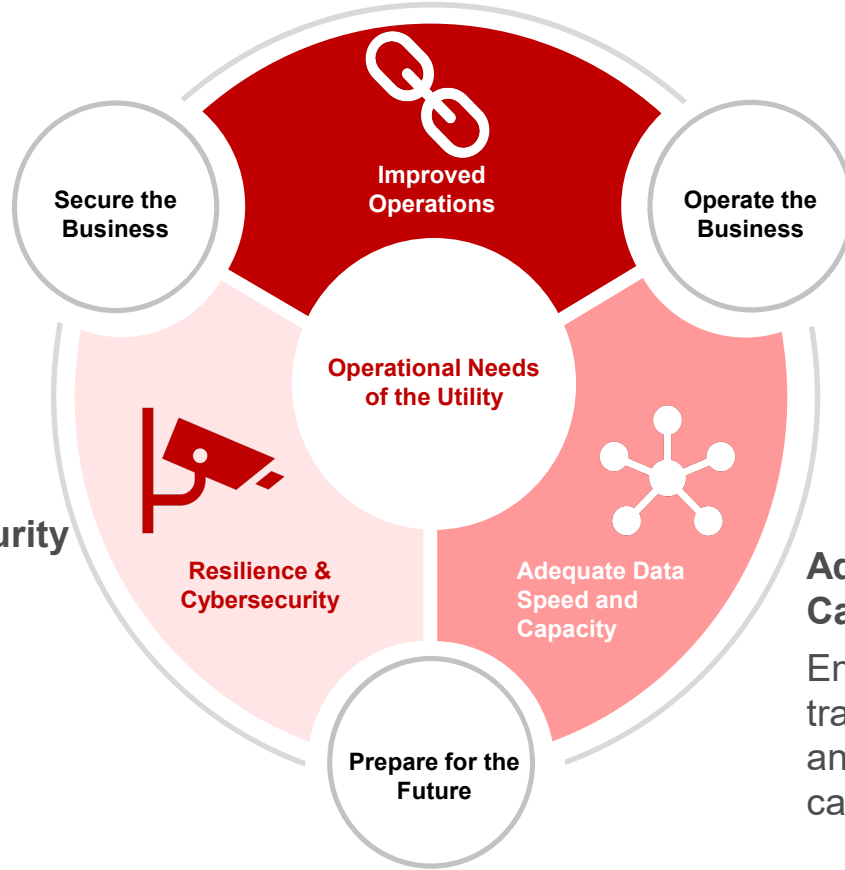
- Intended to improve quality of life for all stakeholders & enhance economic development
- Comprised of multiple infrastructure layers, **including grid/electric, lighting, telecom, data and transportation**
- Underpinned and enhanced by digital technology and applications for public safety, transportation, energy management and other civic services
- Enhanced by strong collaboration and partnership across the public and private sector

For Southern Company, it is an opportunity to

- Enhance the quality of life in the communities we serve, make them attractive places to live and work
- Efficiently utilize our investments in grid, connectivity, distributed energy resources and lighting infrastructure to support community growth
- Strengthen relationships with government and community leaders at all levels

Smart Cities is a \$70B global market; \$18B in US, growing at a 19% CAGR.

67% of 200 US cities surveyed suggest they are investing in smart cities. Of those that aren't, another 25% are exploring options.



Improve Operations
Enable rapid growth in number of devices to provide greater visibility, control and flexibility across gas and electric T&D infrastructure

Resilience & Cybersecurity
Expand segmented network architecture to provide greater security and redundancy

Adequate Data Speed & Capacity
Ensure that data volume and transfer rates meet current and future needs for digital capacity



Questions?