Southern Company

SMART GRID Strategy

Carlton Blue

SoCo Smart Grid

- Why we need a strategy
- Smart Grid Characteristics
- Existing SoCo Smart Grid Technologies
- Emerging Technologies
- Next Steps

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SoCo Smart Grid

Why are we developing a strategy?

- Communicate Southern Company's current state of technology utilization
- Meet customer, legislative, regulatory expectations
- Innovations occurring in the industry
- Platform for engaging in the national discussion
- Ensure support for emerging technologies

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Smart Grid
Why so much attention?

- Concern over Electric Grid's ability to meet future demands
- Concern over national security
- Nationwide Environmental focus
- AMI initiatives
- Vendor interest -> $$$
- Consultants -> $$$

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Smart Grid
National Attention

Title XIII of the 2007 Energy Independence and Security Act:

TITLE XIII—SMART GRID

SEC. 1301. STATEMENT OF POLICY ON MODERNIZATION OF ELECTRICITY GRID

It is the policy of the United States **to support the modernization** of the Nation's electricity transmission and distribution system to maintain a reliable and secure electricity infrastructure that can meet future demand growth and to achieve each of the following, which together characterize a **Smart Grid**:

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Smart Grid
National Attention

- DOE (Department of Energy)
- FERC (Federal Energy Regulatory Commission)
- NARUC (National Association of Regulatory Commissioners)
- Legislators
- Vendors
- Environmental Groups

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Industry groups involved in Smart Grid

- Consortium for Electric Reliability Technology Solutions
- DRBizNet (Demand Response)
- Dynamic Energy Management Initiative
- Galvin Electricity Initiative
- GridApp Consortium
- GridWise
  - GridWise at PNNL
  - DOE GridWise
  - GridWise Alliance
  - GridWise Architecture Council
- Intelligent Utility Network Coalition
- IntelliGrid
- Modern Grid Initiative
- OpenAMI
- Smart Energy Alliance
- UtilityAMI

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What is a Smart Grid to SoCo?

A Smart Grid, to Southern Company, is a seamless, telecommunication enabled power delivery system that utilizes electronic data and other technologies to optimize system performance, reliability, and the customer's experience.

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Smart Grid Characteristics

- Reliable – Self-Healing
- Interactive with customers
- Secure – Resist cyber attack
- Integrated applications, monitoring and control systems

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Smart Grid Characteristics

- Provides appropriate power quality
- Accommodates various generation and storage
- Enhances market participation
- Optimizes assets and operates efficiently

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Existing Smart Grid Technologies

- SCADA
- Significant amount of IED's (Intelligent Electronic Devices)
- Distribution Automation
  - SCADA controlled line devices
  - Automated Fault Isolation and Restoration Schemes
- Remote fault, harmonic, and waveform data retrieval

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Communication networks

- MAS, SoLINC, Utilinet radio systems
- Frame Relay circuits
- Fiber network – multiple fiber rings
- FlexNet radio – AMI tower based system

Customer Interaction

- Real-Time Pricing – large customers
- Power Credit program – Air conditioner run time control
- Good Cents Select – critical peak pricing for residential
- AMI deployment to > 4 million customers!

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Energy Efficiency

- Power factor correction programs
- Distribution Efficiency Program – GPC conservation voltage reduction program - 175 MW at peak, 70 MW passive savings

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Systems Integration

- Integrated Distribution Management System (IDMS) – APC initiative currently being developed to create single user interface for system operation and optimization
- SCADA – OMS – systems are linked for real-time outage information

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Environmental

- Gas Insulated Substations (GIS) – reduces substation footprint
- Underground Transmission – 115 & 230 kV

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Emerging Smart Grid Technologies

- Pursue technologies that provide **value** to:

  customers **employees**

  stockholders **public**

  on a **cost-justified prioritized** basis.

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Reliability

- **Increase number of IED's**
- **Expand deployment of automatic restoration schemes**
- **Automated fault anticipation / location**
- **Automated short circuit calculation / fault location**
- **Reporting fault / equipment sensors**

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Reliability

- **Protection scheme validation**
- **Enhanced data visualization**
- **Automated switching management**
- **Contingency analysis**

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Customer Interaction

- **Maximize AMI deployment opportunities**
- **Expanded real-time pricing**
- **Smart appliances for demand response**
- **Web hosted applications**

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Energy Efficiency

- Loss reduction initiatives
- Remote capacitor monitoring
- Power flow optimization
- 250 MW DEP expansion at GPC
- AMI – Demand response
- F.A.C.T.S.

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Systems Integration

- **IDMS development and deployment**
- **AMI – OMS – SCADA integration**

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Asset Optimization

- **Equipment sensor technologies – predictive maintenance**
- **Dynamic rating of conductors**

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Power Quality

- Harmonic data acquisition
- Voltage sag suppression
- Loose neutral detection

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Distributed Generation / Energy Storage

- Monitor industry innovations
- Support research in solar, plug-in electric vehicle technologies
- Streamline interconnection process for small generators

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Summary

- Much focus on Smart Grid and energy efficiency
- Southern Company is a leader in Smart Grid deployment
  - Robust communications
  - Significant number of IED on SCADA network
- AMI deployment will offer active customer participation in energy purchase decision-making
- IDMS will verify the benefits of systems integration
- All initiatives will be approved and benefits cost justified

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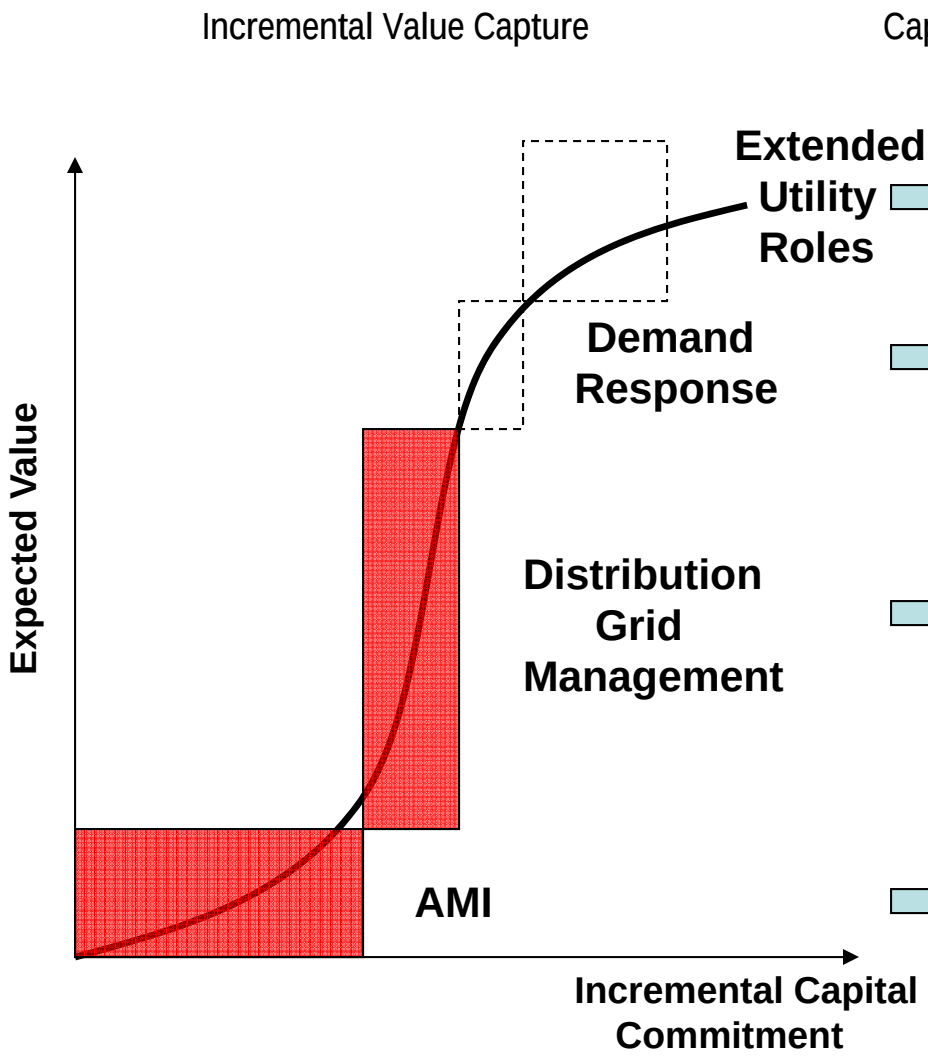
Questions?

AMI's Initial Capital Outlay is a Foundation for the Future



- **Incremental investments**
  - Communications bandwidth
  - Business development capital
- **Incremental utility-side capital**
  - Programmatic, customer-facing and physical device management systems
- **Incremental field capital and knowledge-based applications**
  - Sensors & device controllers
  - Distribution operations and automation
  - Information management
- **Initial capital outlay**
  - Meter functionality
  - Communications infrastructure
  - Head-end and legacy systems modifications

Slide Credit: AEP