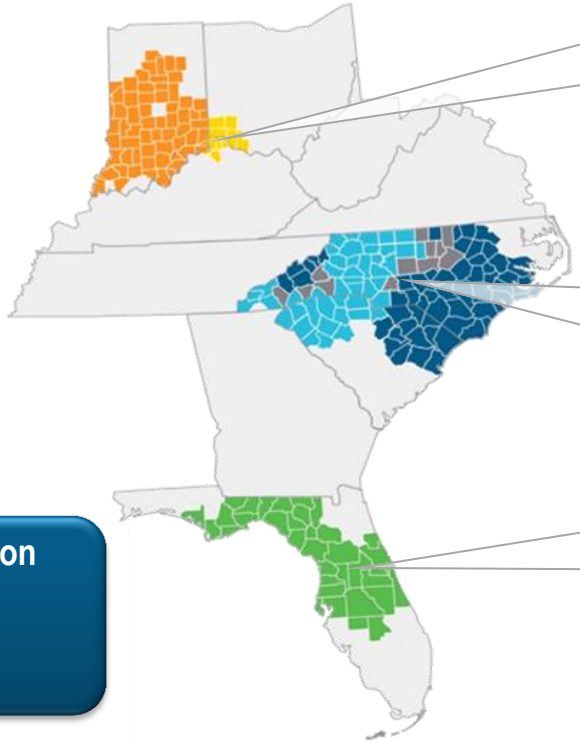
ARRA-Supported Smart Grid Deployment Efforts at Duke Energy

Jay Oliver, Director Grid Automation | DOE EAC Meeting | March 27, 2015

Major Grid Modernizing Deployments

ENTERPRISE

- Meter Data Management
- Distribution Management System



MIDWEST

- Advanced Metering Infrastructure
- Customer Enablement Pilots
- Distribution Automation
- Integrated Volt/VAR Control

CAROLINAS

- Advanced Metering Infrastructure
- Customer Enablement Pilots
- Condition Based Monitoring
- Distribution Automation
- Integrated Volt/VAR Control

FLORIDA

- Advanced Metering Infrastructure
- Customer Enablement Pilots
- Distribution Automation
- Distribution SCADA

Grid Modernization Investments
$1.3 Billion
Since 2009

Benefits of Grid Modernization

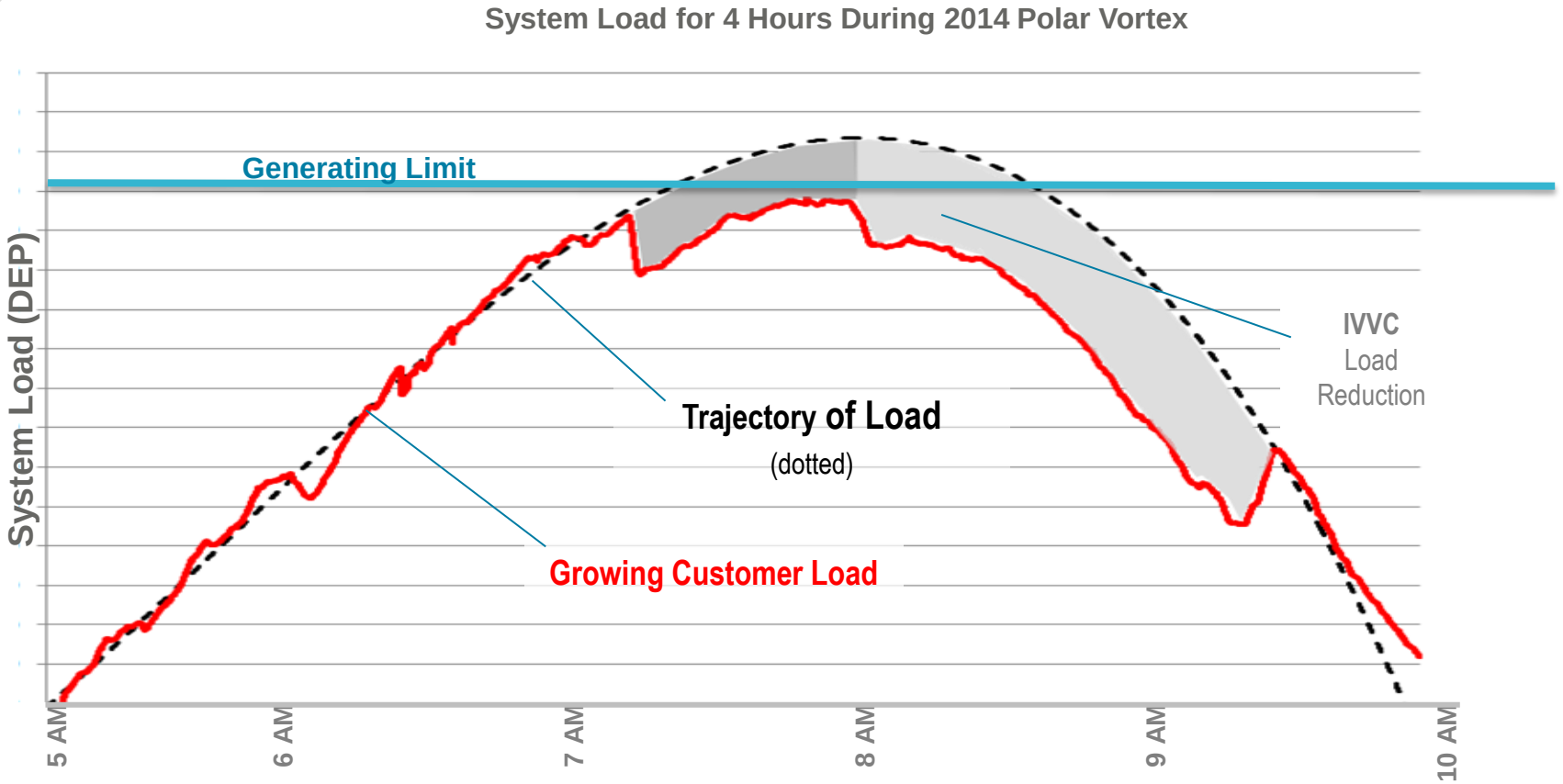
- Improved reliability
- Faster response
- Access to information

- Situational awareness
- Remote operation
- Condition-based maintenance

- Grid efficiency
- Reduced truck rolls
- Renewables integration

- Reduction in accidents
- Reduced exposure

Example - Distribution System Demand Response Performance



Lessons Learned from Deployment Efforts

Distribution Automation

- Automation projects require significant change mgmt & stakeholder engagement
- Automation projects are IT *and* business projects (heavily engage both)
- Lean on field pilots for new technology to help resolve issues early

Integrated Volt/VAR Control

- Senior mgmt sponsorship is critical (utility and vendor)
- Dedicated cross-functional project teams required
- Do not underestimate configuration & testing needs
- Data accuracy is critical to dist mgmt system model
- Need somebody accountable to benefit delivery

Advanced Metering

- Stand up key processes early (change mgmt, stakeholder engagement)
- Consider *real* business value of new tech (implementation and maintenance costs)
- Vender diversification and technology interoperability can greatly mitigate risk
- Include storm response in resource planning

Smart Grid Program

- Strong exec vision and sponsorship essential
- Get early participation of key stakeholders (IT & bus)
- Dedicated communication resources on project team can support needed stakeholder engagement
- Engage vendors early & often to mitigate risks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