



U.S. Department of Energy

Office of Electricity Delivery and Energy Reliability

North American SynchroPhasor Initiative

DOE Update

Phil Overholt

Toronto, Ontario Canada

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www.oe.energy.gov

Advanced SynchroPhasor Research Projects

\$4.3 million awarded to four, 3-year projects

- **Regents of University of California**
SynchroPhasor-based Adaptive Relaying
- **Virginia Polytechnic Institute and State University**
Implement Synchrophasor-based Three-Phase Tracking State Estimator for Unbalanced Conditions and Adaptive Relaying
- **Georgia Tech Research Corporation**
Real-Time Implementation of the Distributed Dynamic State Estimation for On-line Generator Parameter Identification and Wide-Area Transient Stability Analysis
- **Electric Power Research Institute**
Wide-area, Real-time Visualization of Frequency, Voltage and Current Contours for Security Monitoring, on-line Identification of Major Events and Event “instant” Replay

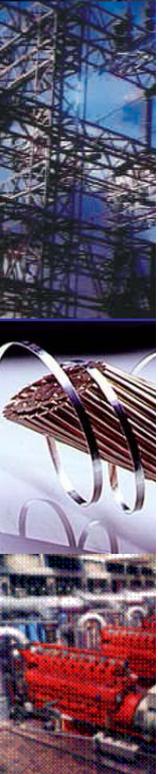




Advanced SynchroPhasor Research Projects (cont')

- **Washington State University**

Power Grid Reliability and Security – Analysis and Simulation for a Secure Communication Network from PMU to Synchrophasor Applications





Ongoing Advanced SynchroPhasor Research Projects

- Modal Analysis for Grid Operations
- New Security Tools for Real-Time Operations
- Adaptive Islanding Demonstration
- Mode Meter Development
- Characteristic Ellipsoid Method
- Reliability Compliance and Monitoring Tools
- PMU Test, Evaluation and Calibration





SGIG Electric Transmission Systems Projects

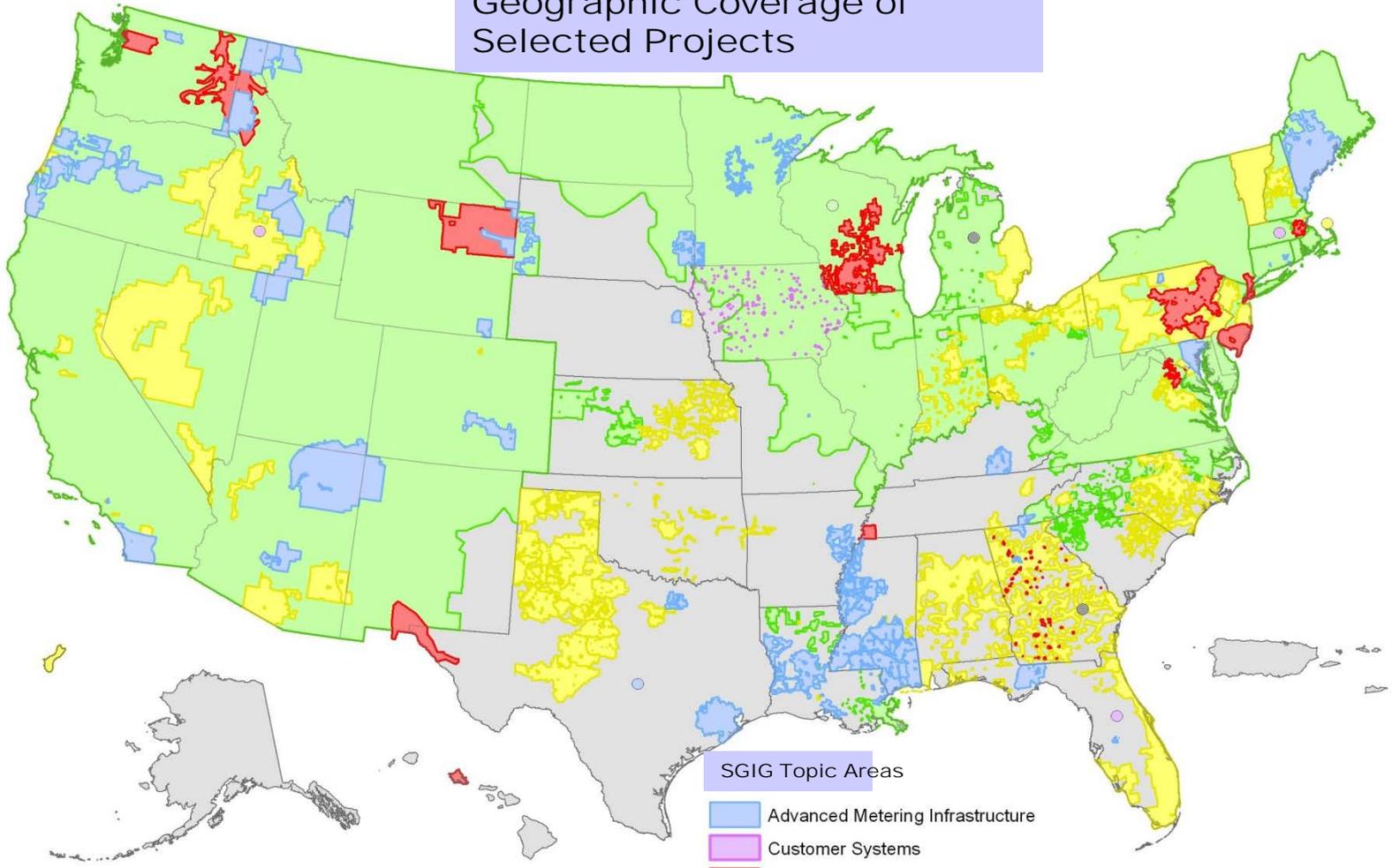
- American Transmission Company, LLC (PMU) \$2.7*
- American Transmission Company, LLC (SCADA) 22.9
- Duke Energy Carolinas, LLC 7.8
- Entergy Services, Inc. 9.2
- Midwest Energy, Inc 1.4
- Midwest ISO, Inc – 9 trans owner partners 34.5
- ISO New England, Inc – 7 18.1
- New York ISO, Inc - 8 75.7
- PJM Interconnection, LLC – 12 27.8
- Western Electricity Coordinating Council – 18 107.8

* Total Project Cost





Geographic Coverage of Selected Projects



SGIG Topic Areas

- Advanced Metering Infrastructure
- Customer Systems
- Electric Systems Distribution
- Electric Transmission Systems
- Equipment Manufacturing
- Integrated and/or Crosscutting Systems

100 Projects

Circle indicates project where specific utility/area is not known.

SMART GRID INVESTMENT GRANTS



SGIG Synchrophasor Projects Applications - a Sample

- Wide-Area Visualization and Monitoring
- Angle and Frequency Monitoring
- Inter-area Oscillation Detection & Analysis
- Proximity to Voltage Collapse
- State Estimation
- Dynamic Model Validation
- Fast Frequency Regulation



Contact Information

North American Synchrophasor Initiative: www.naspi.org

Alison Silverstein
alisonsilverstein@mac.com

Jeff Dagle
Jeff.dagle@pnnl.gov

Office of Electricity Delivery and Energy Reliability
U.S. Department of Energy: www.oe.energy.gov

Phil Overholt
philip.oveholt@hq.energy.gov