

# **Envisioning a Smarter Grid**

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**NASPI Work Group Meeting** 

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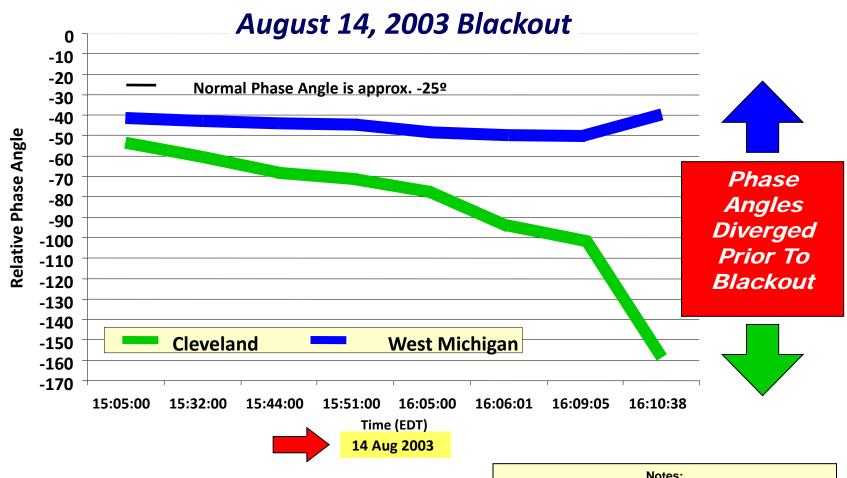
# People notice electricity only in its absence.

David E. Nye – When the Lights Went Out: A History of Blackouts in America





### When Visibility is Lacking



#### Notes:

Angles are based on data from blackout investigation. Angles are calculated from a Powerflow Simulation. Angle reference is Browns Ferry.



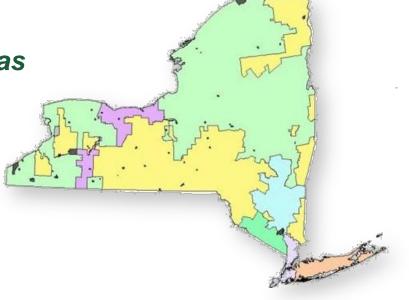
#### **NYISO SGIG Project**

- Smart Grid Investment Grant (SGIG)
  - Three-Year project -- \$74 Million (DOE SGIG funding of \$37 Million to cover 50% of project cost)
- Project components
  - Creation of a statewide Phasor Measurement Network
  - Installation of Capacitor Banks throughout the state
- Enhanced reliability
  - PMU Installation one of key DOE recommendations from 2003 blackout study endorsed by FERC and NERC



### **SGIG Project Partners**

- New York Transmission Owners
  - Central Hudson Electric & Gas
  - Consolidated Edison
  - Long Island Power Authority
  - National Grid
  - New York Power Authority
  - New York State Electric & Gas
  - Rochester Gas & Electric





## NYISO/TO Synchrophasor Applications Wide Area

LEGEND

Research

**Pilot** 

Implementation

**Enhanced Static State Estimator** 

**GIC Monitoring** 

**Harmonics Monitoring** 

Disturbance Recording

Controlled System Separation

Dynamic Model Calibration

Situation Awareness

**Enhanced Static State Estimator** 

Voltage Stability
Monitor

**Frequency Monitoring** 

Oscillation Monitoring

Stress Monitoring Wide Area Control (Oscillations, contingencies)

Dynamic State Estimation

Fault Detection & Location

Adaptive AGC w/Fast Frequency Regulation

Enhanced Market Modeling (VSM/renewables)

Renewables Integration

Islanding Detection

Training
Simulator
Enhancements



#### **NYISO Infrastructure**

- New state-of-the-art primary control center in a facility adjacent to existing corporate center
- Renovation of 42year-old power control facility to serve as alternate control center



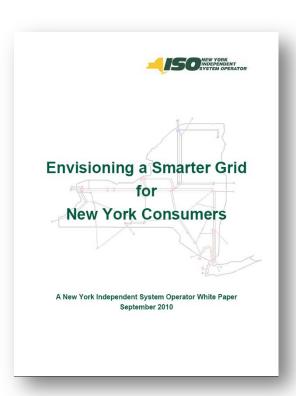
Existing Corporate Center

New Primary Power Control Center



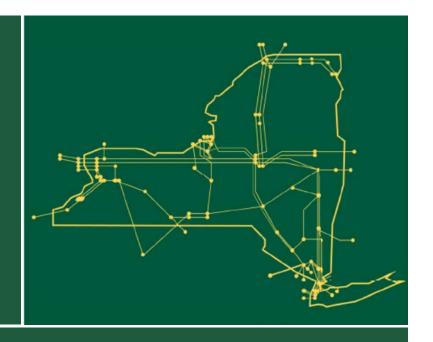
#### **NYISO Smart Grid Vision**

- Lower costs and expand consumers' understanding and control of their electricity use
- Enhance the reliability and efficiency of the power system by improving grid operators' situational awareness and control
- Assist the growth of renewable resources and complementary energy storage resources





The New York Independent System Operator (NYISO) is a not-for-profit corporation responsible for operating the state's bulk electricity grid, administering New York's competitive wholesale electricity markets, conducting comprehensive long-term planning for the state's electric power system, and advancing the technological infrastructure of the electric system serving the Empire State.



#### www.nyiso.com