

Status of STANDARDS FOR THE Smart Grid

December 10, 2008

IEEE Standard Board Meeting

Dick DeBlasio

**IEEE Standards Board Member and
Liaison to U.S. DOE, and SCC21 Chair**

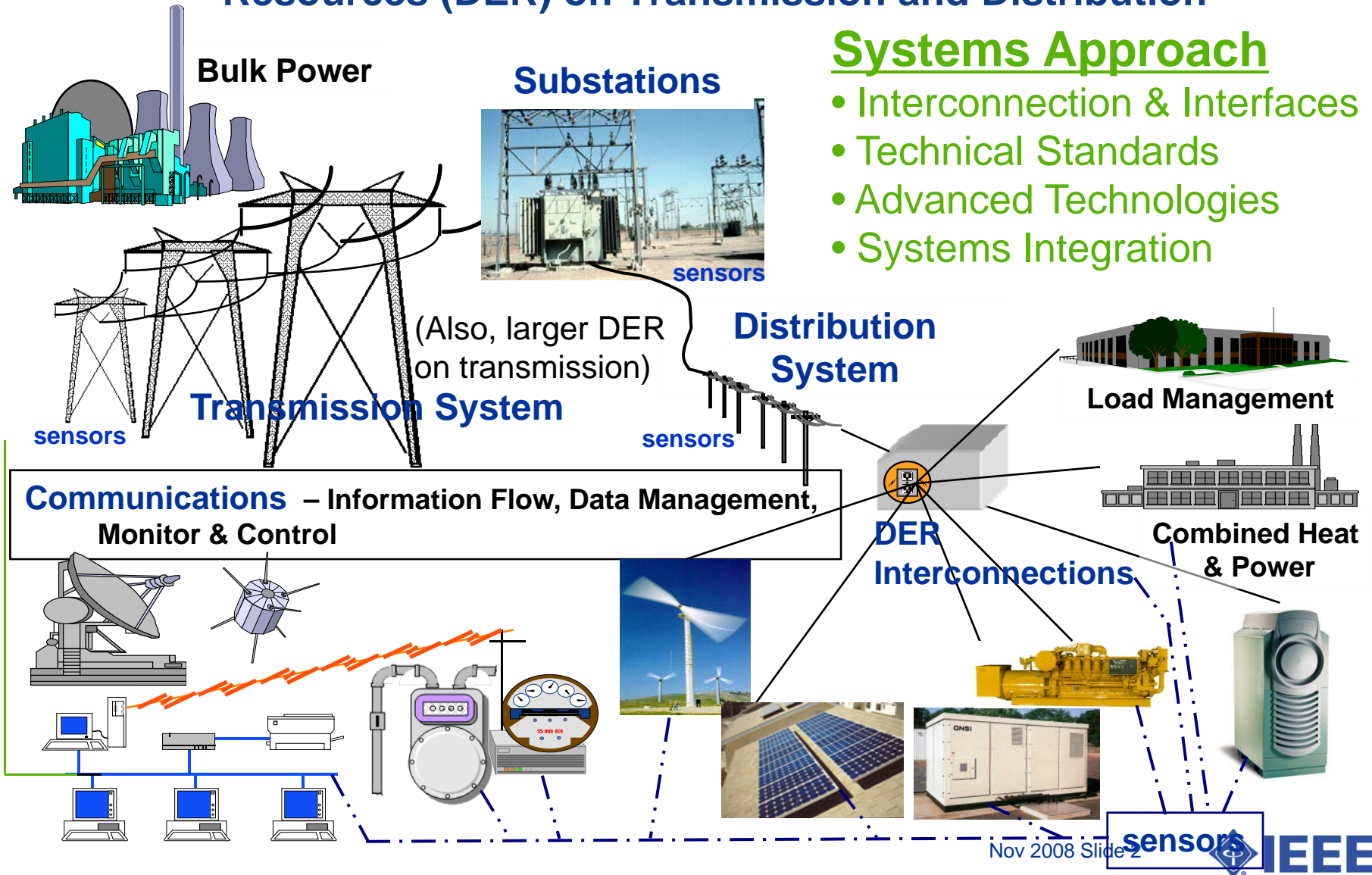


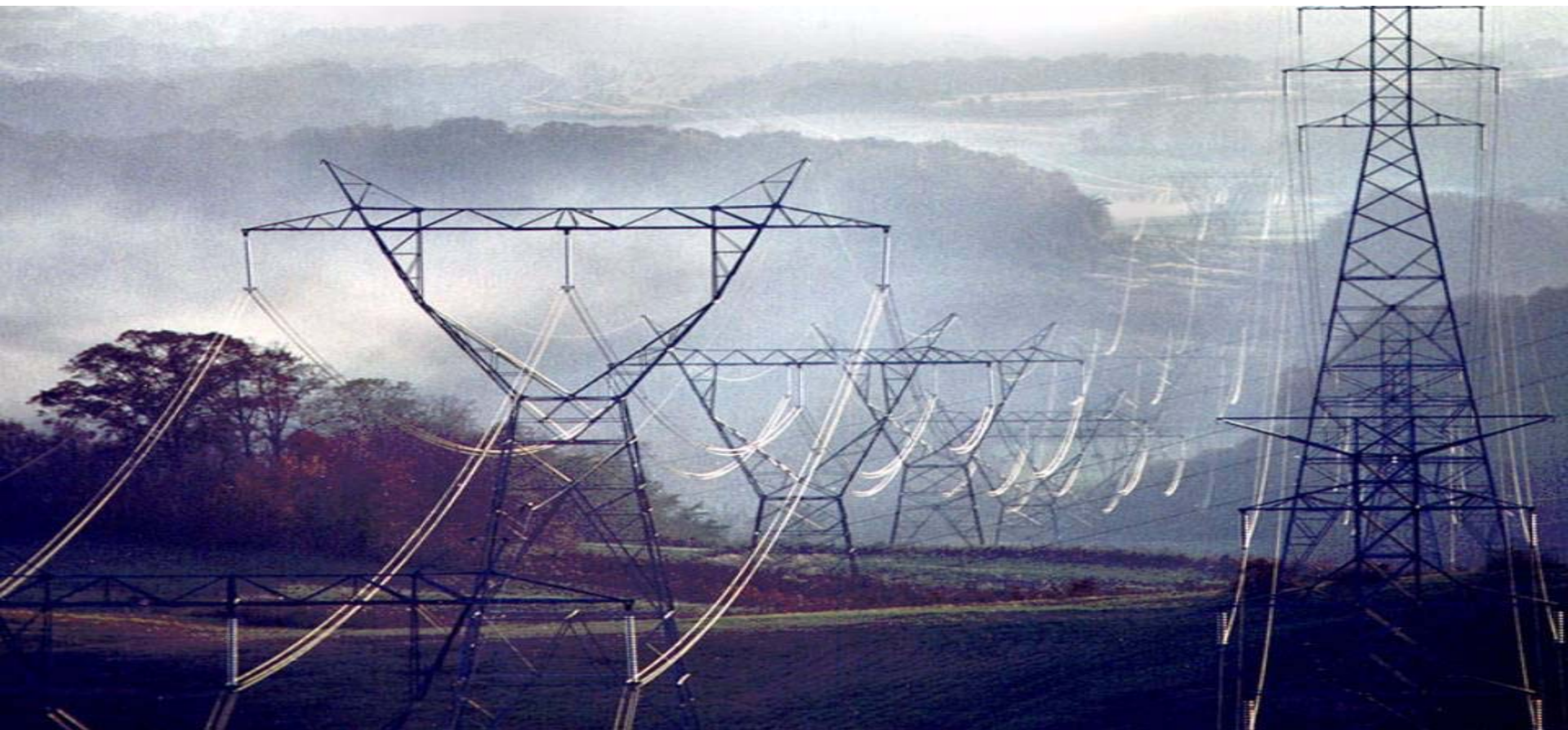
Example - Smart Grid - Interoperability - Distributed Energy

Resources (DER) on Transmission and Distribution

Systems Approach

- Interconnection & Interfaces
- Technical Standards
- Advanced Technologies
- Systems Integration





- **Two things make electricity unique and a challenge for Smart grid:**
 1. **Lack of flow control (Grid Management and control transformation is needed – i.e., communications)**
 2. **Electricity storage requirements (static or dynamic storage and load optimization/power electronics – efficiency)**
 - **Change either of these and the grid delivery system will be transformed**
 - **Smart Grid Design and Operation can Enable this to Happen.**

IEEE's role in smart grid standards

- *Numerous IEEE standards relate to the smart grid including diverse fields of digital information and controls technology, networking, security, reliability assessment, interconnection of distributed resources including renewable energy sources to the grid, sensors, electric metering, broadband over power line, and systems engineering. The standards are developed by a variety of expert groups within IEEE.*

NIST Interoperability Framework of standards and protocols

- Energy and Security Independence Act of 2007
- NIST Domain Expert Working Groups (DEWGs)
 - to identify use cases, key standards, standards gaps, for inclusion in the future Smart Grid Standards Interoperability Roadmap.
 - Building-to-Grid (B2G)
 - Industrial-to-Grid (I2G)
 - Home-to-Grid (H2G)
 - Transmission and Distribution (T&D)
 - Vehicle to Grid (V2G) – future
 - Cyber Security - new

Source - NIST EISA Smart Grid Coordination Plan 6/2/08 at <http://www.nist.gov/smartgrid/>

NIST activity continued

- Face to Face meetings at Gridweek (Sept), Gridinterop (Nov) plus telecons and Twiki
- Current areas of focus: use cases, taxonomy, December progress report to Congress
- Dick DeBlasio ,provided a presentation at IEEE 2030 Energy Conference, in Atlanta. On November 18, 2008. (Co-authored a paper with Cheery Tom)
- Draft report to Congress from NIST expected in early December, 2008. (Early indications are that it will be preliminary with suggested recommendations on series of white papers in 2009)

IEEE Task Force supporting NIST Smart Grid Interoperability Framework

- **IEEE Point of Contact (POC) and *IEEE* Smart Grid Ad-Hoc Review Group Lead - Dick DeBlasio, SCC21 chair**
- **Power Engineering Society POC - Steve Pullins, Secretary, Intelligent Grid Coordinating Committee**
- **Computer Society POC – John Waltz, IEEE CS/VP**
- **Members at large to Date: Sam Sciacca (CEO/Microsol), James Pace /George Flammer /Jay Ramasastry (Silver Spring Networks), Chris Knudsen (PG&E), Phil Slack/George Casio (FPL), Bob Heile (chair IEEE 802.15), Geoff Mulligan (chair – 6LoWPAN), Alex Gelman (CTO/ NETovations), Chuck Adams (Program Director Standards – IBM), Larry Kotewa (SCC31/Community Energy), Joe Koepfinger (Standards Board Emeritus), Bob Grow (IEEE Standards Board Chair/Intel, Corp.), Steve Mills (Hewlett-Packard Company), Jean-Philippe Faure (P1901 chair), Tom Basso (SCC21 Representative/NREL), Cherry Tom (IEEE Standards Office), Tom Field, Bartosc Wojszczk, Joe Waligorski, and Pat Duggan.**

Proposed IEEE Interoperability SCC21 Standards Project

Proposed Title and Purpose:

Title - IEEE Standard 2030 Guide for Smart Grid Interoperability of Energy Technology and Information Technology operation with the Electric Power System (EPS) and End-Use Applications and Loads.

Purpose – This standard provides guidelines in understanding and defining smart grid interoperability of the electric power system with end use applications and loads. Integration of energy technology and information and communications technology is necessary to achieve seamless operation for electric generation, delivery, and end-use benefits that will permit two way power flow with communication and control. Interconnection and intra-facing frameworks and strategies with design definitions will be addressed that will provide guidance in expanding the current knowledge base. This knowledge base will become a key element in grid architectural designs and operation that will promote a more reliable and flexible electric power system.

IEEE Standards in green technology

- Energy – renewables/ greener, clean technologies
 - Published 1547 series for Distributed Resources
 - P1547 ongoing projects
 - Published 1680 for Electronic Product Environmental Assessment (EPEAT)
- New Potential Project Areas
 - PHEV (plug-in hybrid electric vehicles)
 - Grid interface (SCC21)
 - Batteries
 - Smart Grid
 - Future wind, solar, geothermal, hydro
 - GHG emissions calculations
 - Industrial Energy Efficiency

OBSERVATIONS

- Smart grid Standards will extend across the entire grid (i.e., need interoperability standards (top down) and building block standards (bottom up)).
- Smart grid Equipment Standards will be needed to handle information data management, communications and control.
- Flexible smart grid system Interoperability Design and operational Standards will allow near term and long term smart grid evolution.
- Development of a body of Interoperability Smart grid Standards need to be initiated know.

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