

IEEE Innovative Smart Grid Technologies Conference (ISGT)

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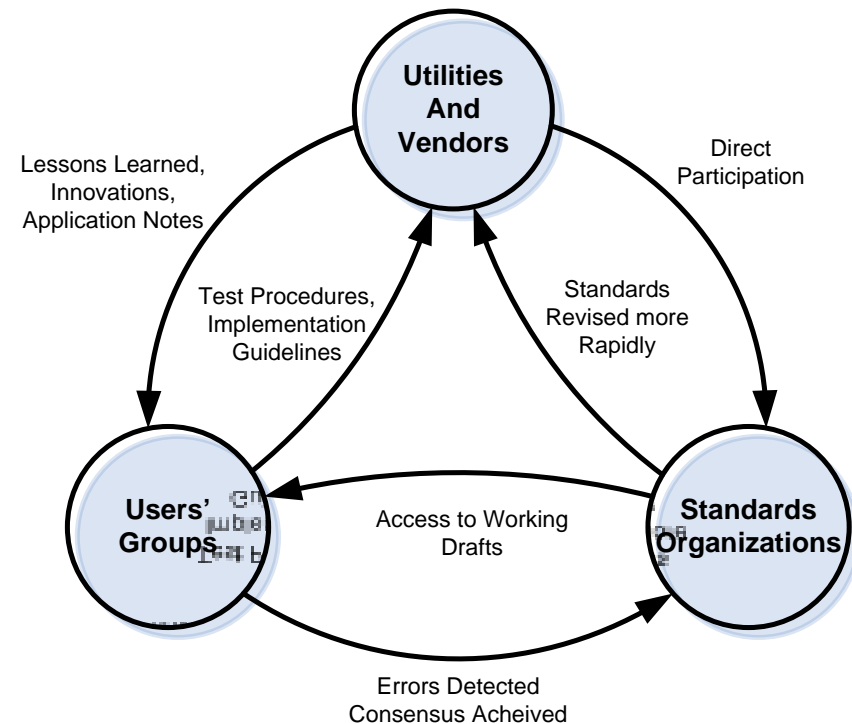
Standards Panel Session

Erich W. Gunther

Vice chair, IEEE PES Intelligent Grid Coordinating Committee
IEEE PES Governing Board Member at Large – Smart Grid
e.gunther@ieee.org

Why Use Standards?

- Productivity - Avoid re-inventing the wheel
- Fewer errors - Learn from industry best practices
- Better requirements specs
- Reduces integration costs
- Prevent vendor "lock-in"
- Larger markets
- Less chance of stranded assets



What needs to be standardized?

For the applications of interest, can we agree on:

- What information is to be exchanged?
- What is the data to be named?
- Who is permitted to talk?
- In what format are messages transmitted?
- What frequencies and signals are used?
- What the connector looks like?

The answers are different for:

- Different physical areas of the grid
- Different functions to be performed

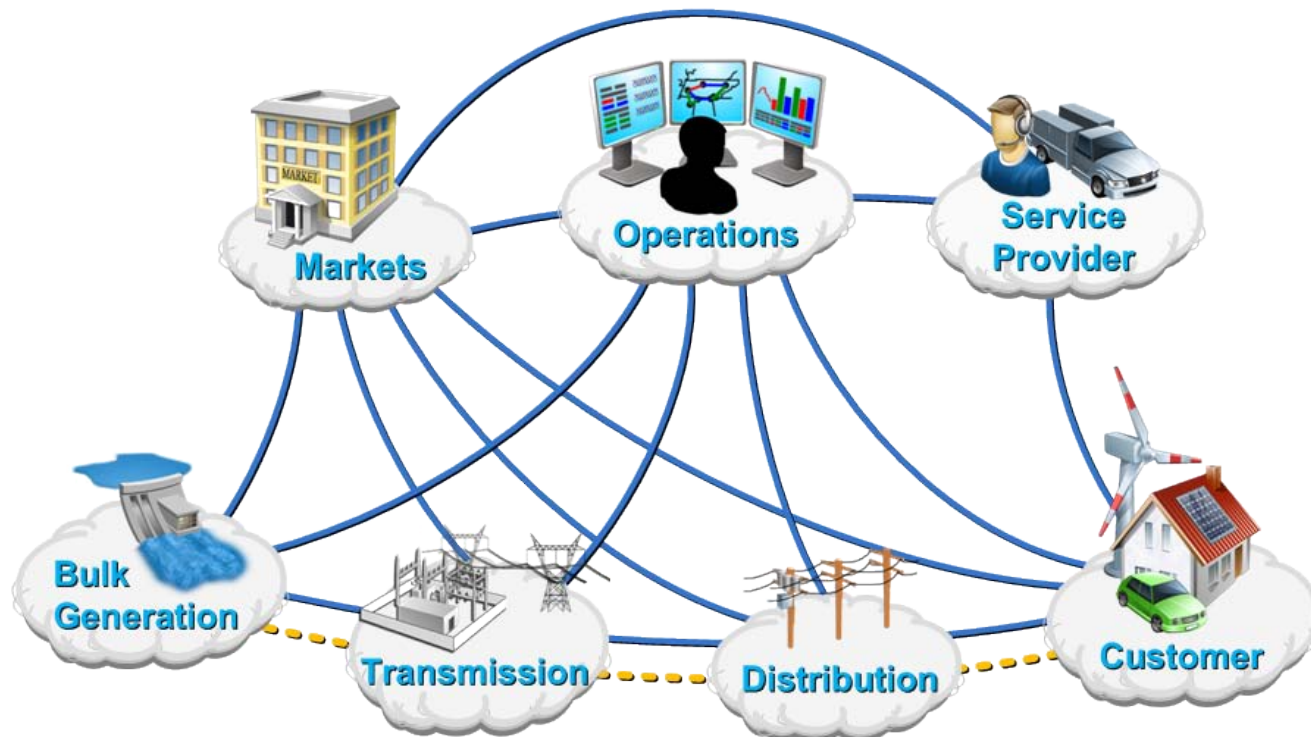


Smart Grid Standards Acceleration Challenges

- The number of stakeholders, range of considerations and applicable standards are very large and complex which ***requires a formal governance structure at a national level involving both government and industry, with associated formal processes to prioritize and oversee the highest value tasks.***
- The smart grid implementation has already started, and will be implemented as an “evolution” of successive projects over a decade or more. ***Standards adoption must consider the current state of deployment, development in progress and vendor product development lifecycles.***
- Interoperability is generally being discussed too broadly and should be considered in two basic ways, with a ***focus placed on prioritization and acceleration of the adoption of “inter-system” standards.***

IEEE Smart Grid Activities

- The IEEE is involved in all aspects of the “smart grid” through our various societies and committees
- Each domain of the NIST conceptual model is addressed by at least one PES committee



IEEE Smart Grid Activities

- Standards Development
 - Our primary role – 100+ SG standards
- Standards Coordination
 - IEEE PES IGCC – Cross PES Committee
 - IEEE NTDC - Cross IEEE Society
 - NIST PAP's – Cross SDO
- Technology Transfer
 - Society meetings and conferences, web portals
- Education
 - Smart Grid 101 Tutorial, Multi-media, books, ...
- Advancing the State of the Art
 - Partner with SGIP Administrator
 - DOE Smart Grid Clearinghouse

Smart Grid Activities - Generation

- IEEE 1595 Standard for Quantifying Greenhouse Gas Emission Credits from Small Hydro and Wind Power Projects and for Grid Baseline Conditions
- IEEE 1797 Guide for Design and Application of Solar Technology in Commercial Power Generating Stations

Smart Grid Activities - Transmission

- IEEE 859 - Standard Terms for Reporting and Analyzing Outage Occurrences and Outage States of Electrical Transmission Facilities
- IEEE 1138 - Standard for Testing and Performance for Optical Ground Wire (OPGW) for use on Electric Utility Power Lines
- IEEE C37.236 - Guide for Power System Protective Relay Applications over Digital Communication Channels
- IEEE 1686 – Standard for Substation Intelligent Electronic Devices Cybersecurity Capabilities

Smart Grid Activities - Distribution

- IEEE 1613 - Standard Environmental and Testing Requirements for Communications Networking Devices in Substations
- IEEE 1402 - Guide for Electric Power Substation Physical and Electronic Security
- IEEE 1366 - Guide for Electric Power Distribution Reliability Indices

Smart Grid Activities – T&D

- IEEE C37.10 - Guide for Diagnostics and Failure Investigation of Power Circuit Breakers
- IEEE C37.10.1 - Guide for the Selection of Monitoring for Circuit Breakers
- IEEE 1679 - Recommended Practice for the Characterization and Evaluation of Emerging Energy Storage Technologies in Stationary Applications

Smart Grid Activities - Consumer

- IEEE 1547 – Standard for Interconnecting Distributed Resources with Electric Power Systems
- IEEE 1250 - Guide for Identifying and Improving Voltage Quality in Power Systems
- IEEE 1159 – Recommended Practice for Monitoring Power Quality
- IEEE 1159.3 – Recommended Practice for Transfer of Power Quality Data
- IEEE C37.95 - Guide for Protective Relaying of Utility-Consumer Interconnections

Smart Grid Activities - Operations

- IEEE C37.1 - Standard for SCADA and Automation Systems
- IEEE C37.118 - Standard for Synchrophasors for Power Systems
- P1601 - Standard for Optical AC Current and Voltage Sensing Systems

Smart Grid Activities - Conclusion

- These examples just scratched the surface
- PES committees have been involved in creating standards for the Smart Grid since well before the “Smart Grid” term was established
- We have a great foundation for the Smart Grid, built upon the expertise of the leaders in their fields.
- One of the upcoming challenges is to break the expertise out of the silos and create the “system of systems” that will make the Smart Grid work.
- We have all been challenged to make it happen faster
- The IEEE is committed to streamlining the standardization process to meet demand