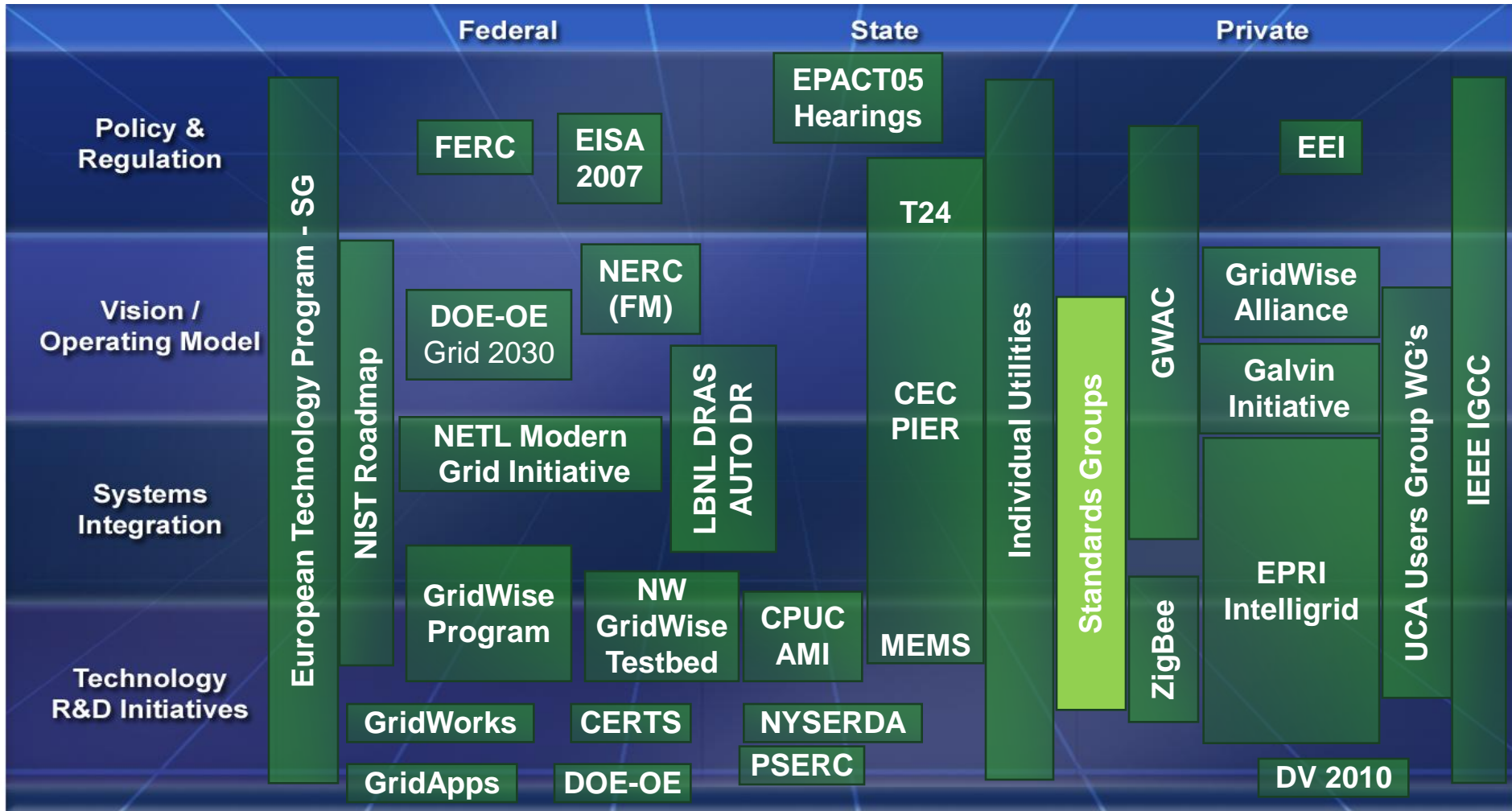
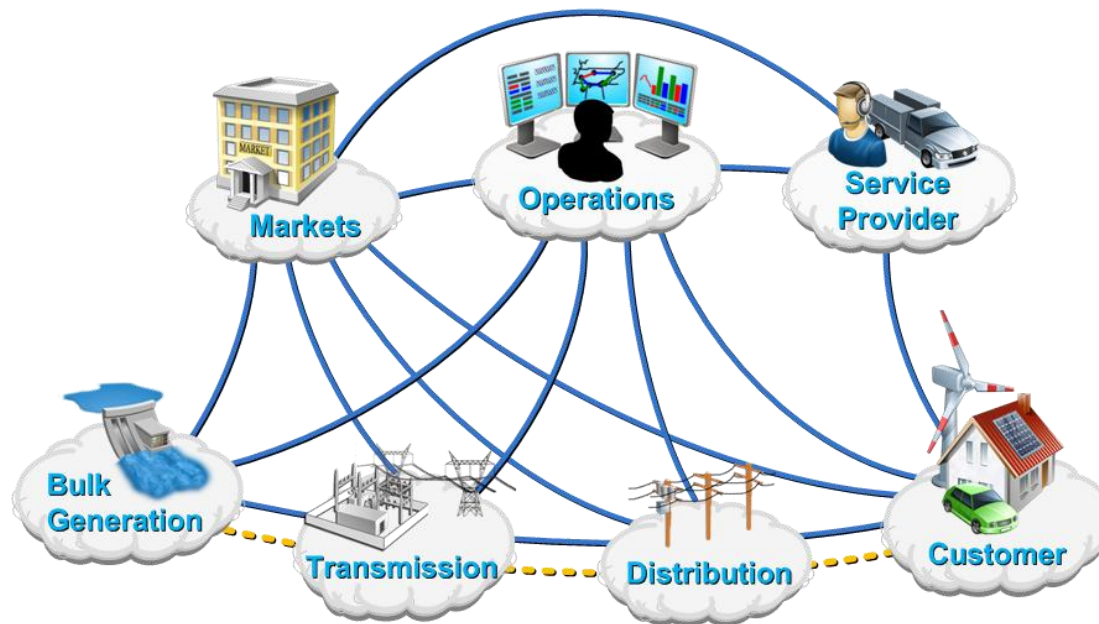


# Smart Grid Activities



# IEEE PES Smart Grid Activities

- PES is involved in all aspects of the “smart grid” through our various committees
- At least one committee of PES addresses each domain of the NIST conceptual model
- Not all are engaged in the Smart Grid overtly (yet), but all are aware and looking forward



# Smart Grid Activities - Generation

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- PE/ED&PG 1595 Standard for Quantifying Greenhouse Gas Emission Credits from Small Hydro and Wind Power Projects and for Grid Baseline Conditions
  - PE/ED&PG 1797 Guide for Design and Application of Solar Technology in Commercial Power Generating Stations
  - Many of the generation standards are focused on the nuts and bolts of the equipment, but the equipment is changing.
  - These standards projects address new concerns and new technologies that will certainly play a part in the Smart Grid
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# Smart Grid Activities - Transmission

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- PE/PSACE 859 IEEE Standard Terms for Reporting and Analyzing Outage Occurrences and Outage States of Electrical Transmission Facilities
  - PE/PSC 1138 Standard for Testing and Performance for Optical Ground Wire (OPGW) for use on Electric Utility Power Lines
  - PE/PSR C37.236 Guide for Power System Protective Relay Applications over Digital Communication Channels
  - PE/1686 – Standard for Substation Intelligent Electronic Devices Cybersecurity Capabilities
  - We found much more than a slide-full of standards from the Committees related to transmission.
  - Standards for capacitors, short circuit limiters, and harmonic filters are all players in the Smart Grid game
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# Smart Grid Activities - Distribution

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- PE/SUB 1613 IEEE Standard Environmental and Testing Requirements for Communications Networking Devices in Substations
  - PE/SUB 1402 IEEE Guide for Electric Power Substation Physical and Electronic Security
  - PE/T&D 1366 IEEE Guide for Electric Power Distribution Reliability Indices
  - The Substations Committee is active in standards related to the Smart Grid
  - These are examples, the list is longer
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# Smart Grid Activities – T&D

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- PE/SWG C37.10 IEEE Guide for Diagnostics and Failure Investigation of Power Circuit Breakers
  - PE/SWG C37.10.1 IEEE Guide for the Selection of Monitoring for Circuit Breakers
  - PE/SB 1679 Recommended Practice for the Characterization and Evaluation of Emerging Energy Storage Technologies in Stationary Applications
  - Switchgear, Transformers, even Stationary Batteries are now participants in the Smart Grid
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# Smart Grid Activities - Consumer

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- IEEE 1547 – Standard for Interconnecting Distributed Resources with Electric Power Systems
  - PE/T&D 1250 Guide for Identifying and Improving Voltage Quality in Power Systems
  - IEEE 1159 – Recommended Practice for Monitoring Power Quality
  - PE/PQ IEEE 1159.3 – Recommended Practice for Transfer of Power Quality Data
  - PE/PSR C37.95 Guide for Protective Relaying of Utility-Consumer Interconnections
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# Smart Grid Activities - Operations

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- PE/SUB C37.1 IEEE Standard for SCADA and Automation Systems
  - PE/PSR C37.118 Standard for Synchrophasors for Power Systems
  - P1601 Standard for Optical AC Current and Voltage Sensing Systems
  - The Analysis and Power System Communications committees are active in Smart Grid work
  - Communicating data and interpreting the information provided is basic to the Smart Grid
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# Smart Grid Activities - Conclusion

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- 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
  - As we saw earlier, we have to work across the boundaries to make the systems work
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# Conclusion

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- PES has many existing standards and authorized projects relevant to applications that qualify as Smart Grid
  - A database that captures all of this information, scopes, technical attributes, NIST domains and other relationships is required
  - Individual committees, subcommittees, and their working groups generally work independently of each other – there is an opportunity for cross committee collaboration
  - PES will be an active participant in the NIST roadmap process to improve existing standards and develop new ones
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