

MODERN GRID STRATEGY

Smart Grid Concepts

U.S. Commercial Service Webinar

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- **What is the Smart Grid?**
- **What are some of the technologies?**
- **Who are some of the players?**
- **Q & A**



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What is the role of the MGS?

- **Define a vision for the Modern Grid**
- **Assist in the identification of benefits / barriers**
- **Facilitate resolution of issues**
- **Promote testing of integrated suites of technologies**
- **Communicate and educate stakeholders**
- **Support Smart Grid implementation**

MGS has been an “Independent Broker” for the Smart Grid



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What is the Smart Grid?



The Smart Grid is MORE:

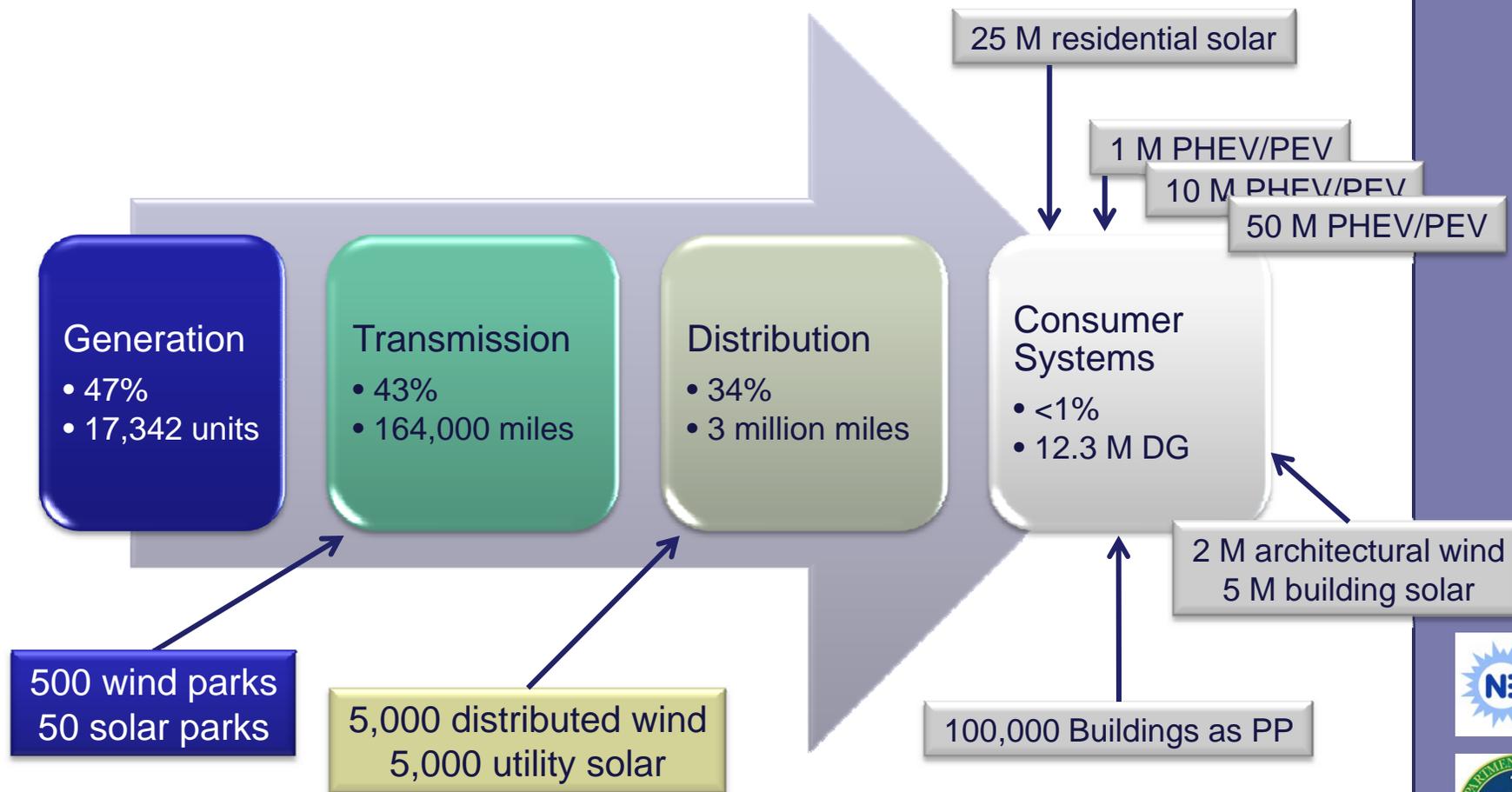
- **Reliable**
- **Secure**
- **Economic**
- **Efficient**
- **Environmentally friendly**
- **Safe**

Improved performance in each of these areas supports “a case for action” to invest in a Smart Grid



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Today's Grid vs. Tomorrow's

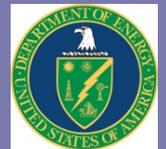


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The Smart Grid is “transactive” and will:

- *Enable* active participation by consumers
- *Accommodate* all generation and storage options
- *Enable* new products, services, and markets
- *Provide* power quality for the digital economy
- *Optimize* asset utilization and operate efficiently
- *Anticipate & respond* to system disturbances (self-heal)
- *Operate* resiliently against attack and natural disaster

...the enabler

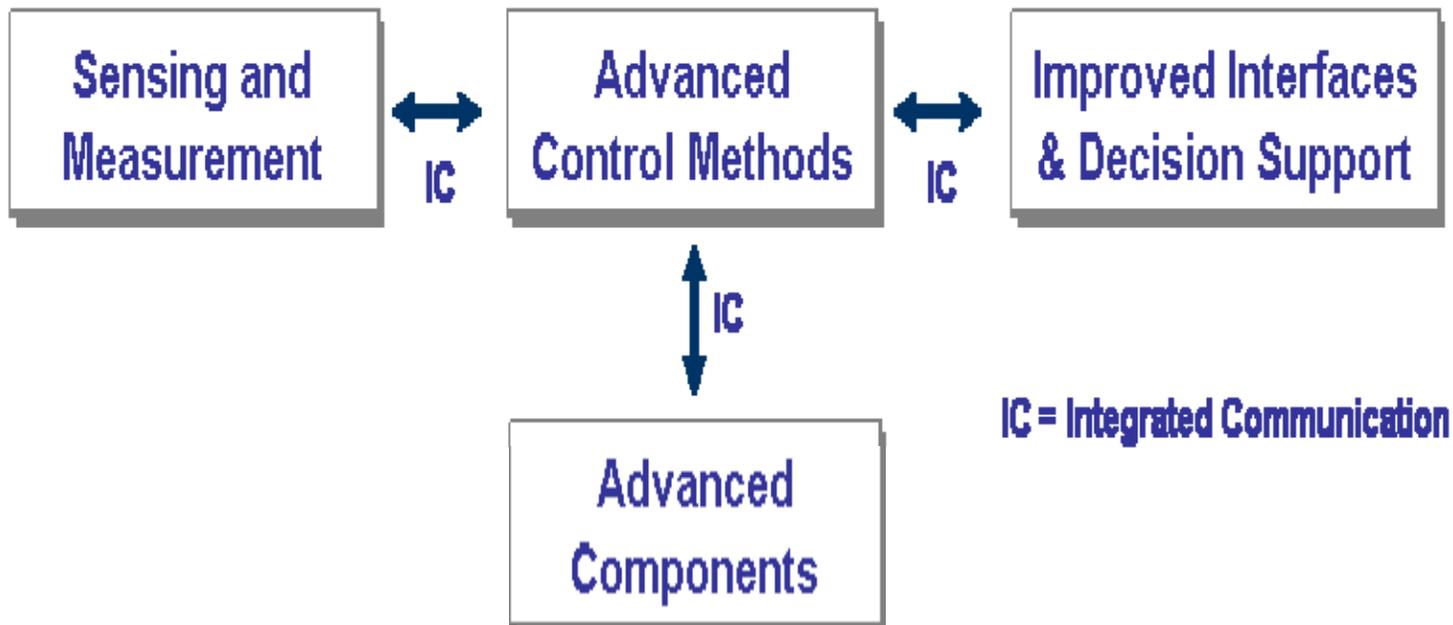


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Some Key Technologies





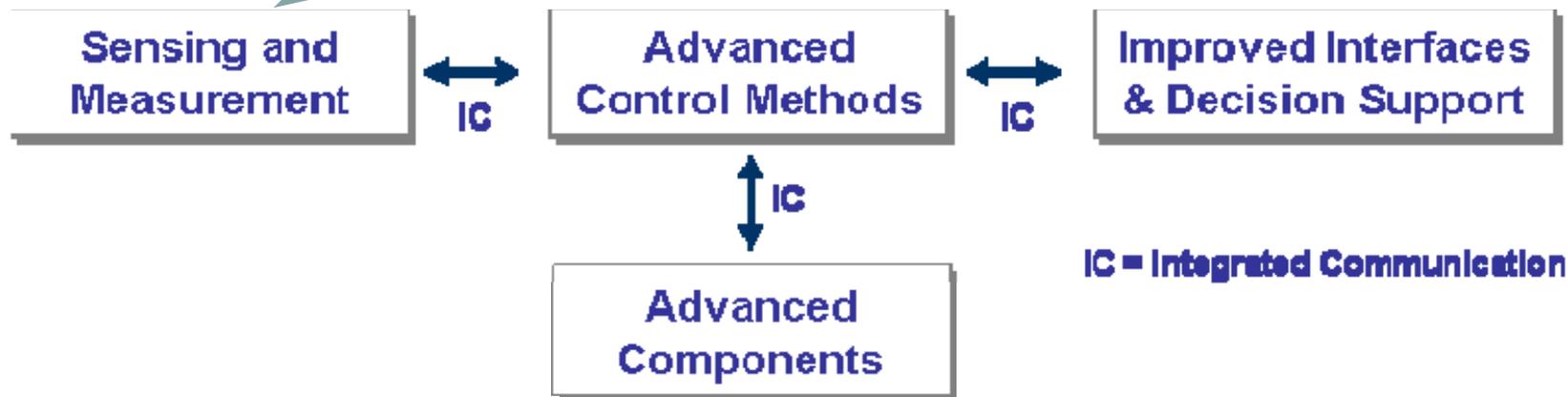
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Smart Grid Key Technology Areas

Smart meters
Smart sensors

- Operating parameters
- Asset Condition

Wide area monitoring systems (WAMS)
Dynamic rating of transmission lines



IC = Integrated Communication

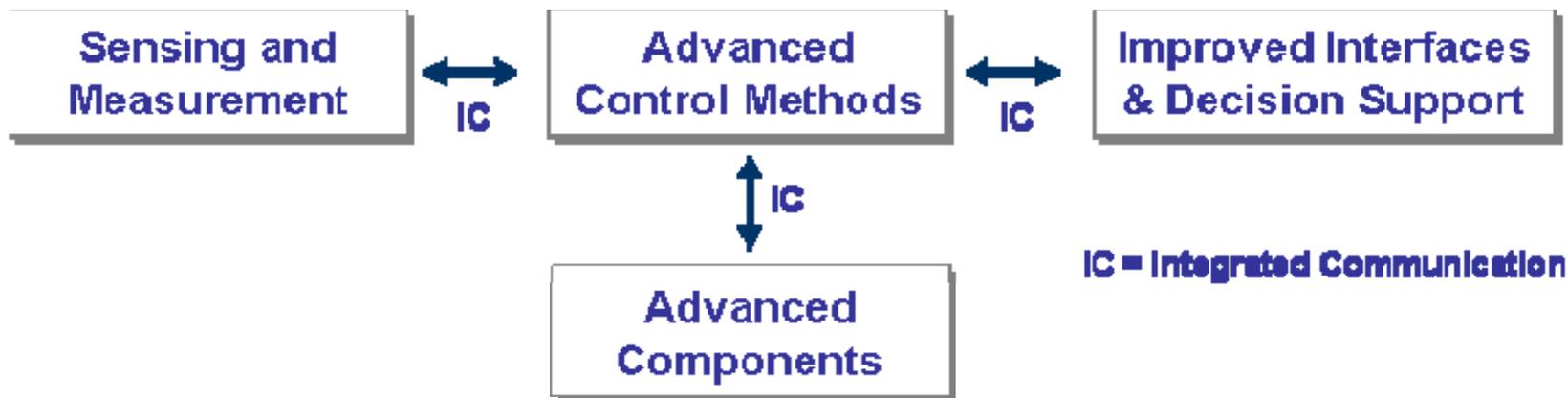


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Smart Grid Key Technology Areas

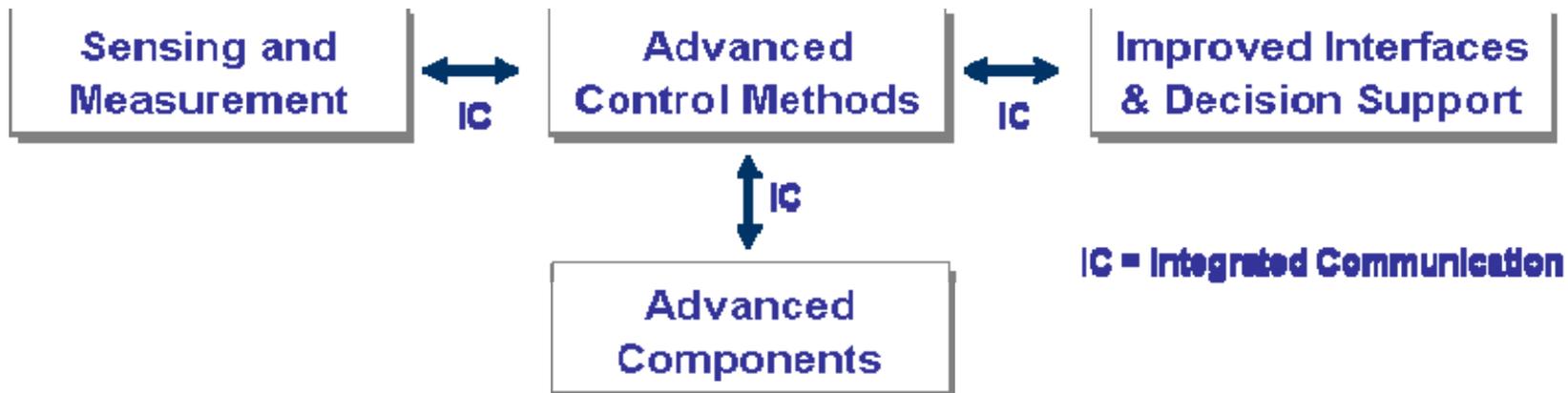
Applications that:

- Monitor and collect data from sensors
- Analyze data to diagnose and provide solutions
- Real time and predictive
- Determine and take action autonomously or via operators
- Provide information and solutions to operators and consumers
- Integrate with enterprise-wide processes and technologies



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Smart Grid Key Technology Areas

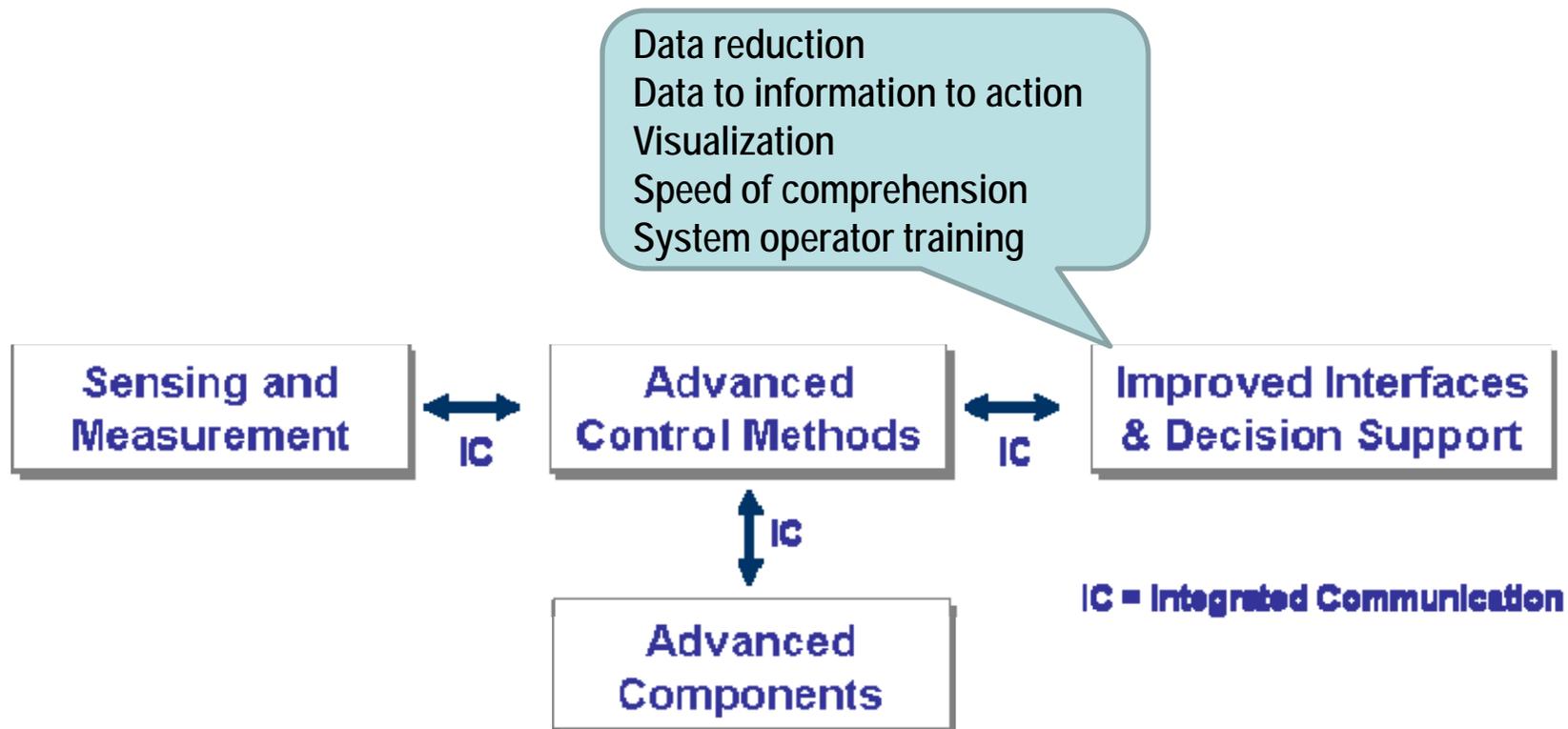


- Next generation FACTS/PQ devices
- Advanced distributed generation and energy storage
- PHEV - V2G mode
- Fault current limiters
- Superconducting transmission cable & rotating machines
- Micro-grids
- Advanced switches and conductors



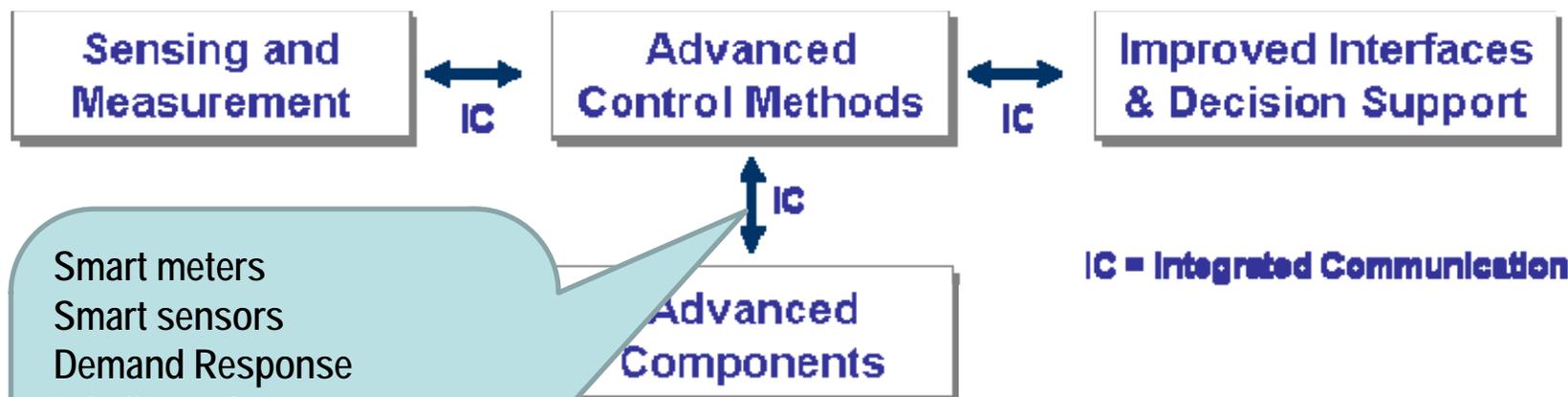
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Smart Grid Key Technology Areas



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Smart Grid Key Technology Areas



IC = Integrated Communication

- Smart meters
- Smart sensors
- Demand Response
- DG dispatch
- Distribution automation
- Micro-grids
- Markets
- Work force management
- Mobile premises (PHEV's)



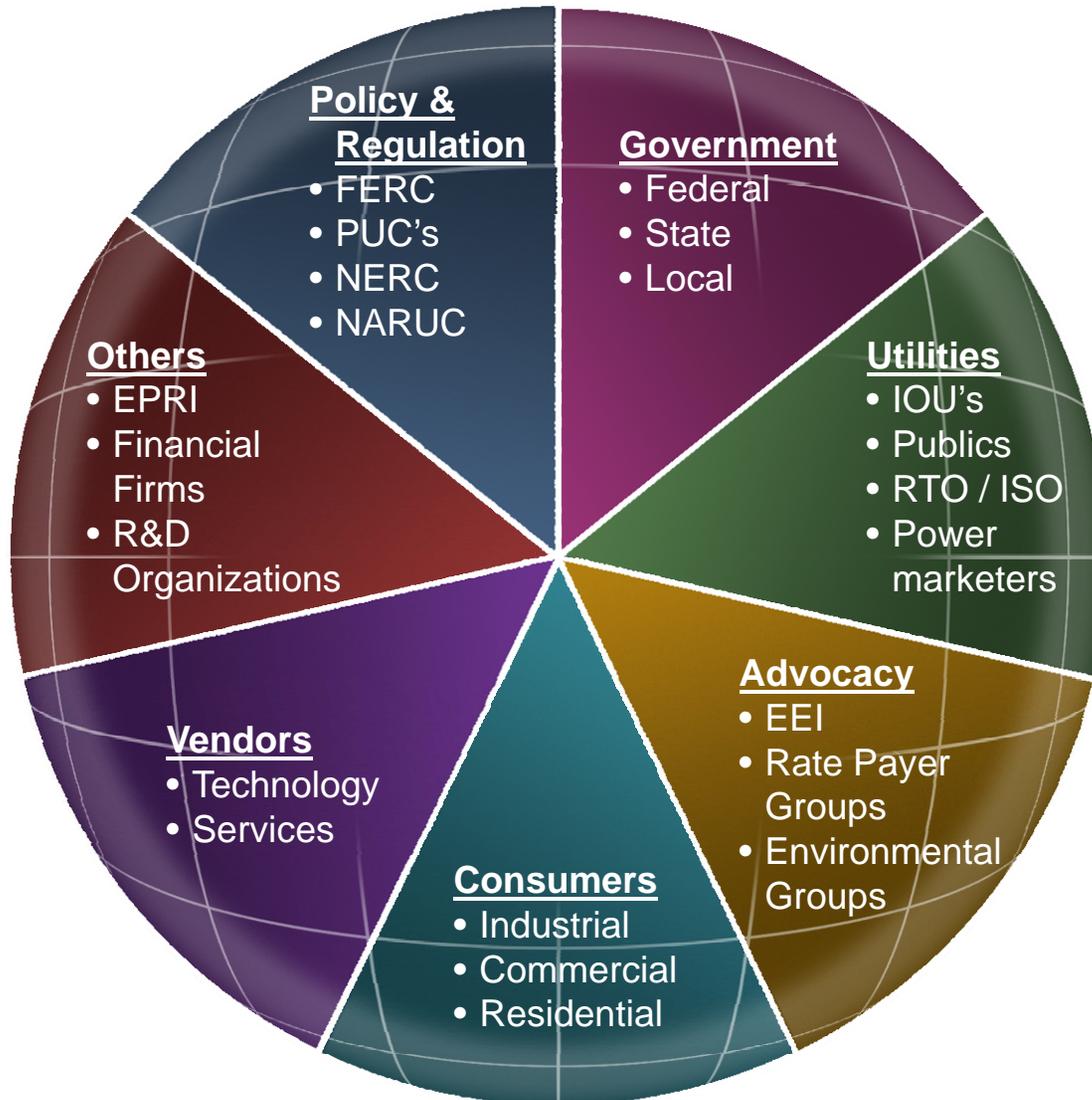
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Who are some of the players?

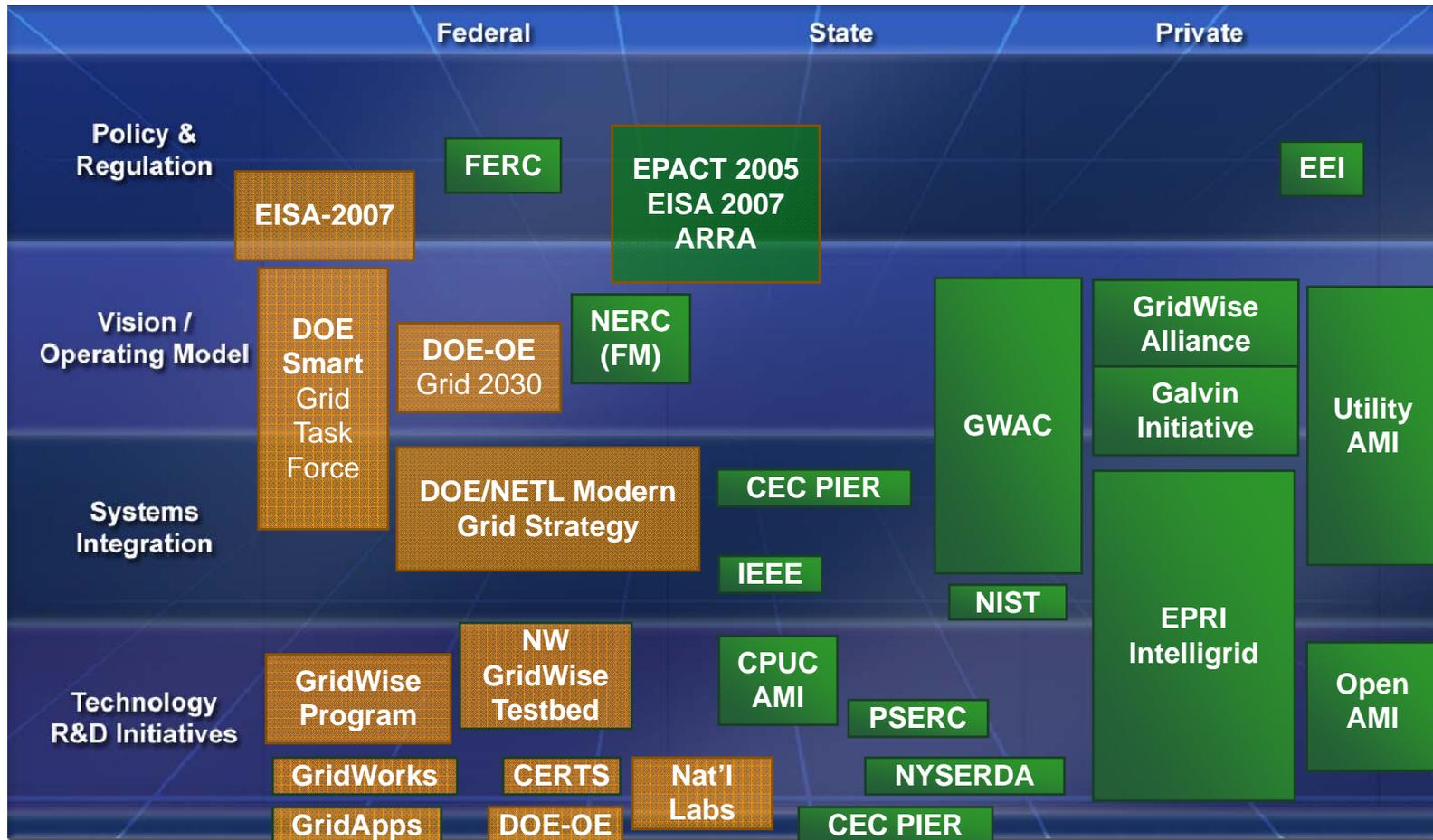


Smart Grid Stakeholders



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Smart Grid "Developers"



Compendium of Smart Grid Technologies

- By KTA
- Lists SG technologies
- Identifies vendors
- Provides links
- Updated July 2009



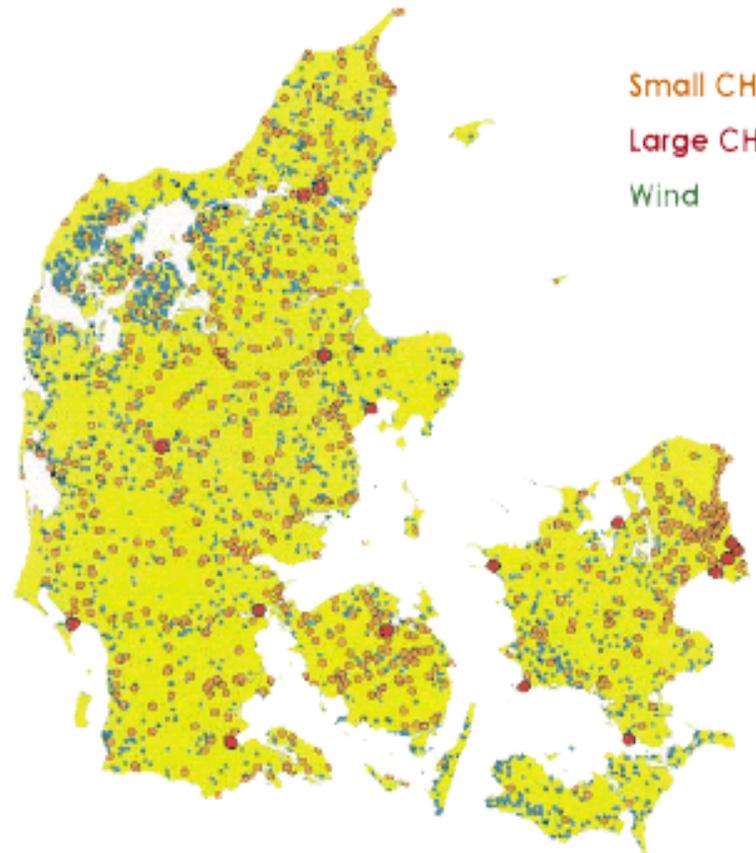
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Denmark Changed in Two Decades

Centralized System of the mid 1980's



More Decentralized System of Today



Source: Danish Energy Center



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Contact Information

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**For additional information, contact
Modern Grid Strategy Team**

<http://www.netl.doe.gov/moderngrid/>

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Questions?

