

# MODERN GRID STRATEGY

## Smart Grid Concepts

**U.S. Commercial Service Webinar**

**Joe Miller – Modern Grid Strategy Team Lead**

**September 16, 2009**



Funded by the U.S. Department of Energy,  
Office of Electricity Delivery and Energy Reliability



Conducted by the National Energy  
Technology Laboratory

## **This material is based upon work supported by the Department of Energy under Award Number DE-AC26-04NT41817**

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

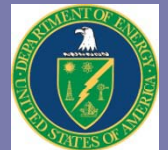


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# What is the role of the MGS?

- **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:*

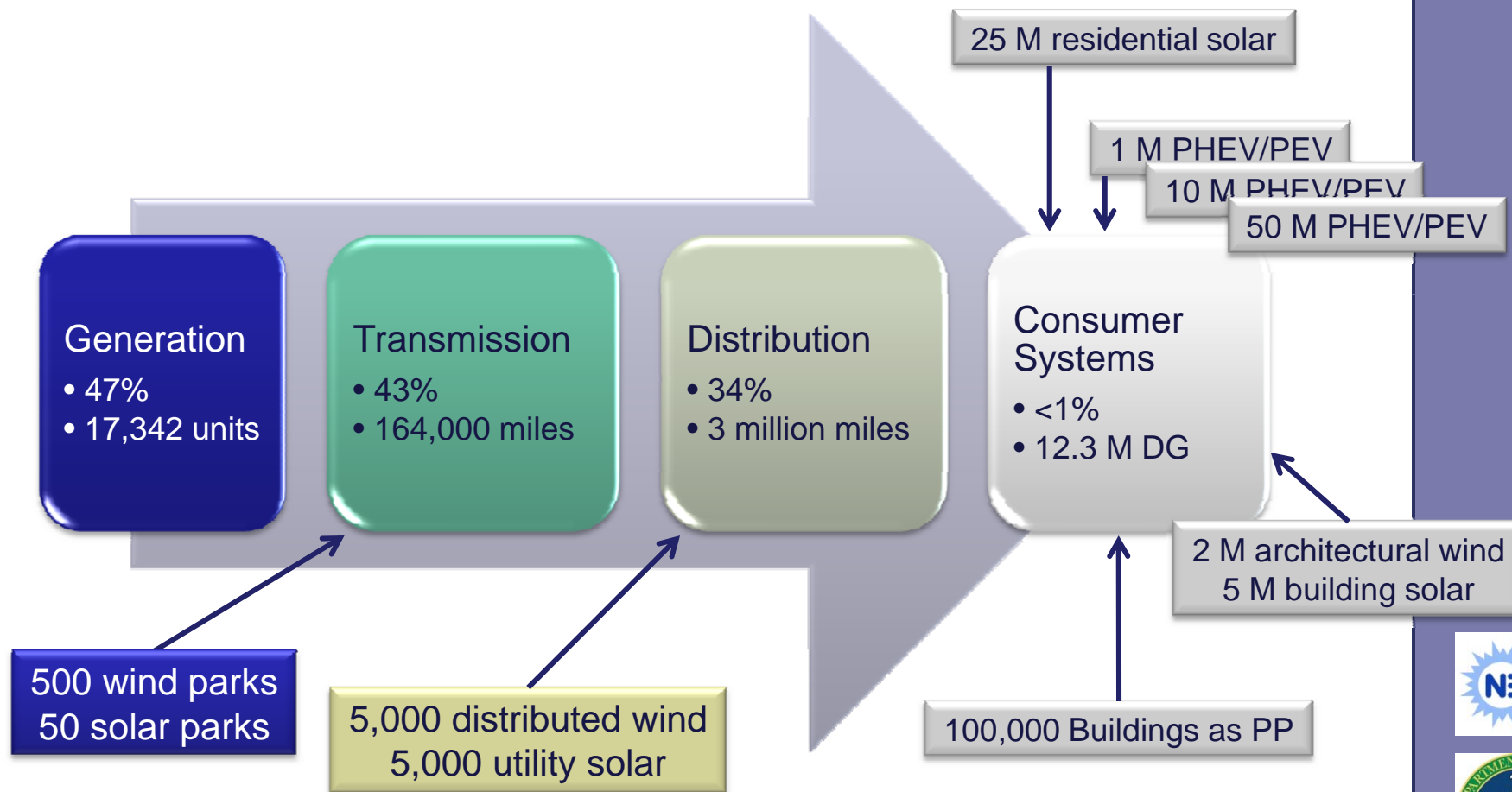
- **Reliable**
- **Secure**
- **Economic**
- **Efficient**
- **Environmentally friendly**
- **Safe**

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

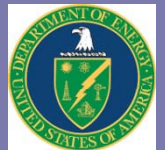


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## ***The Smart Grid is “transactive” and will:***

- *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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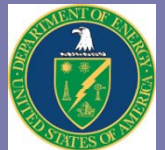
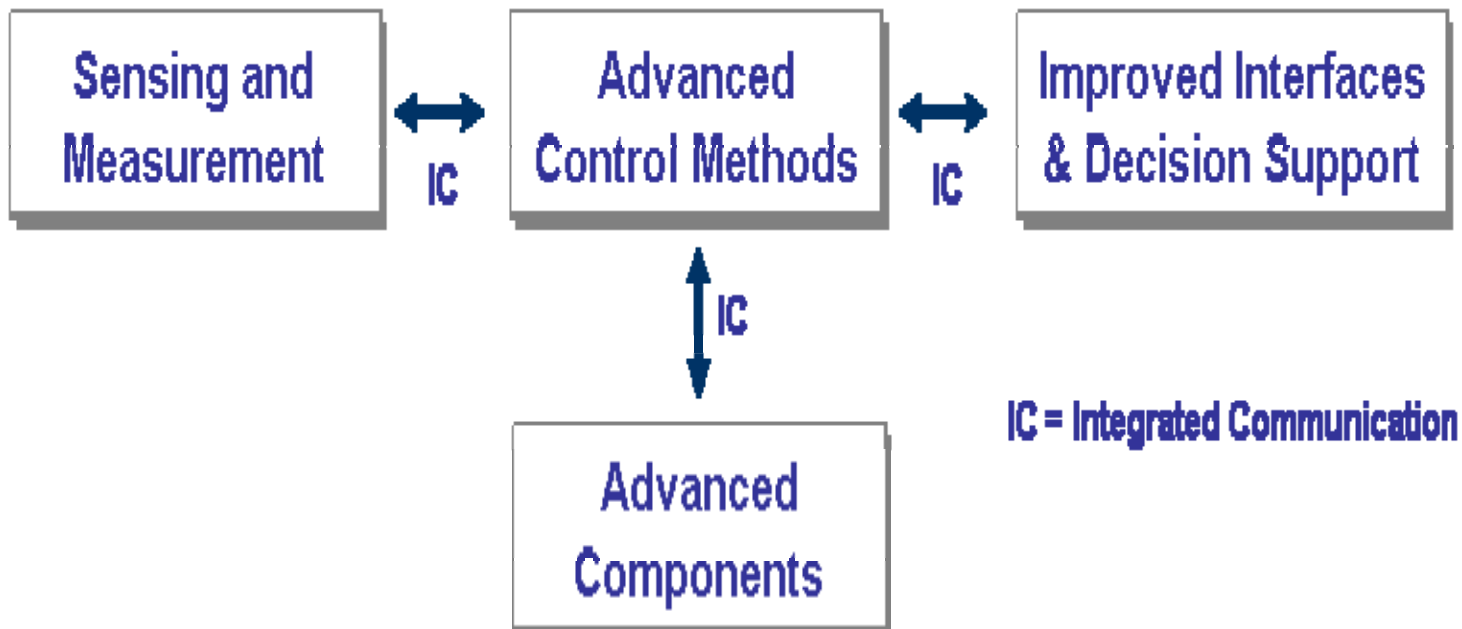


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## Some Key Technologies



# Smart Grid Technologies



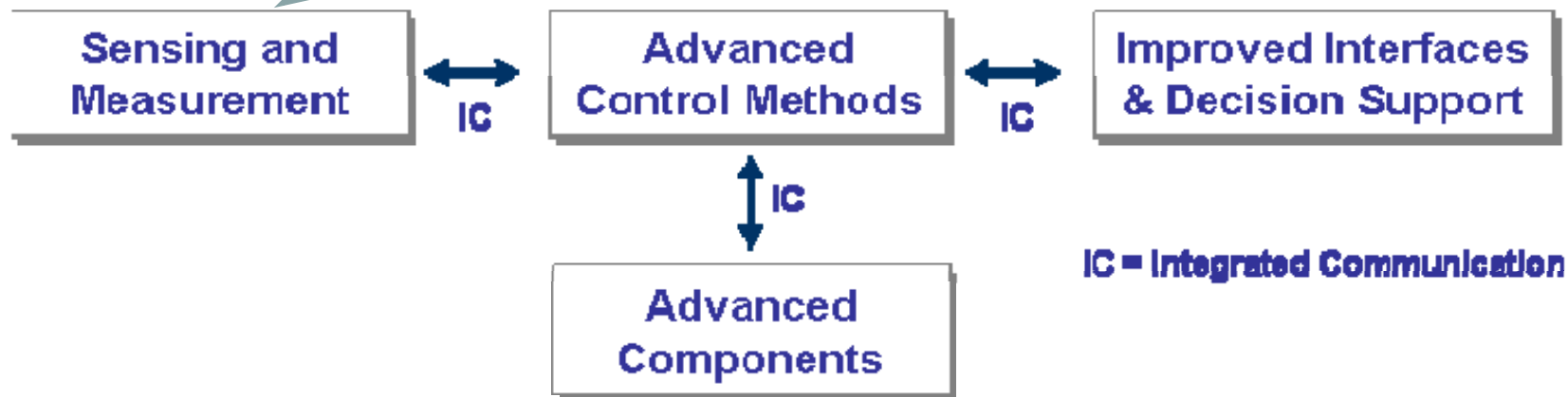
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# Smart Grid Key Technology Areas

Smart meters  
Smart sensors

- Operating parameters
- Asset Condition

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



IC = Integrated Communication

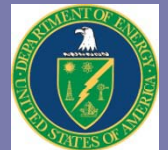
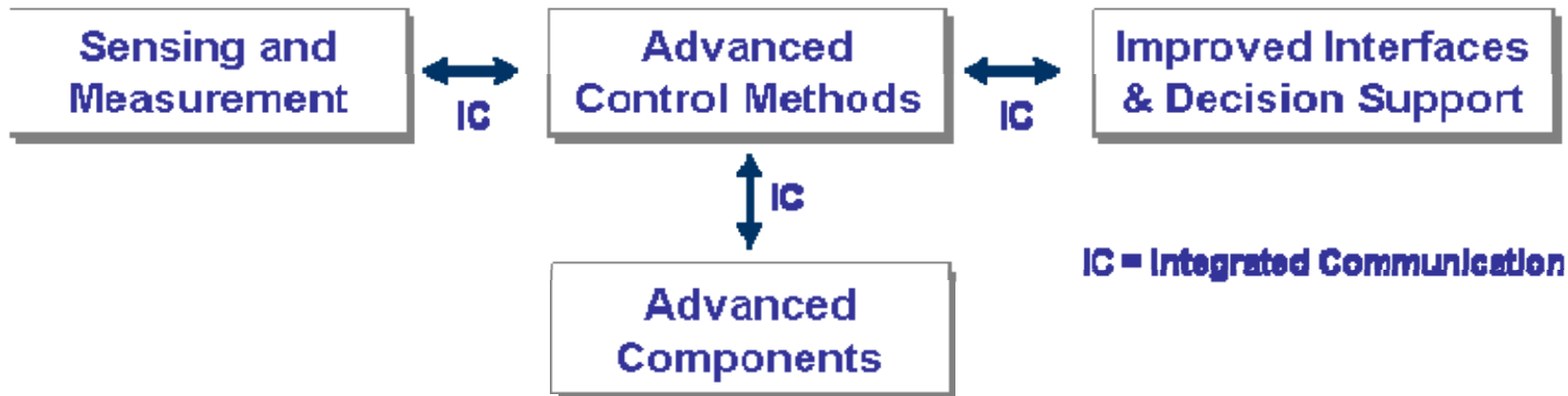


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# Smart Grid Key Technology Areas

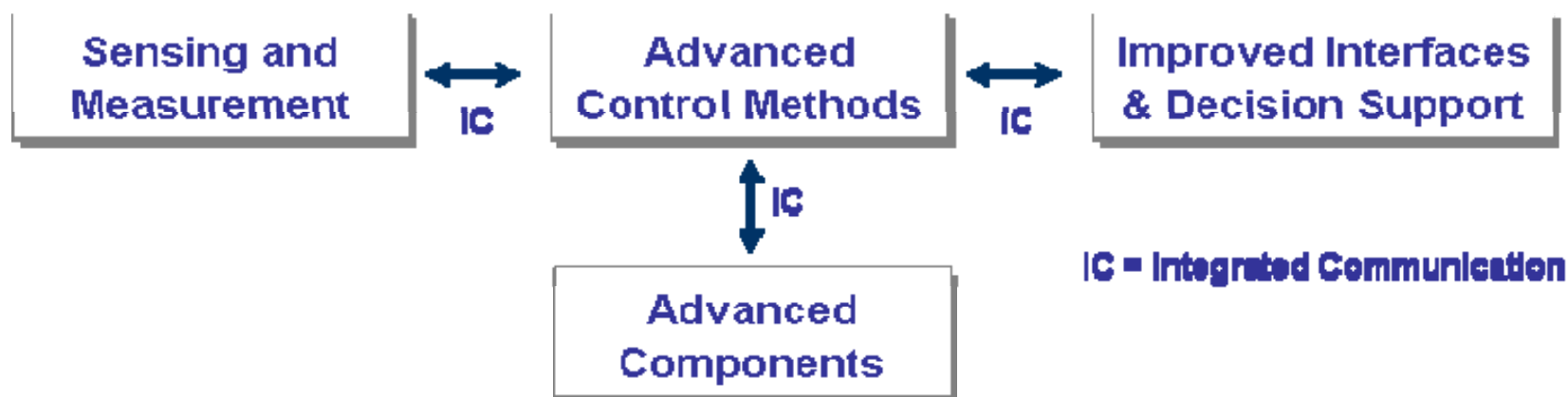
Applications that:

- 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

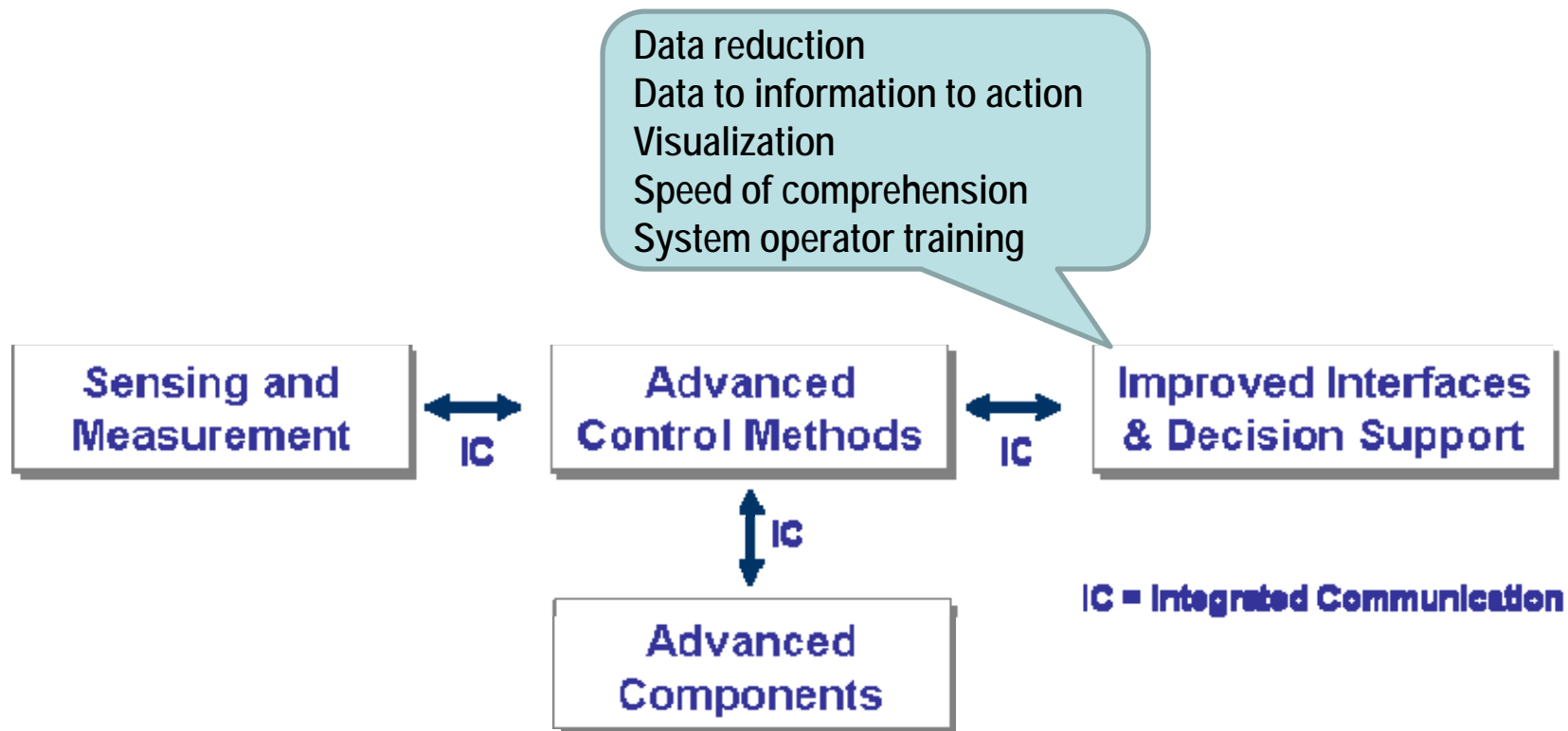


- Next generation FACTS/PQ devices
- Advanced distributed generation and energy storage
- PHEV - V2G mode
- Fault current limiters
- Superconducting transmission cable & rotating machines
- Micro-grids
- Advanced switches and conductors



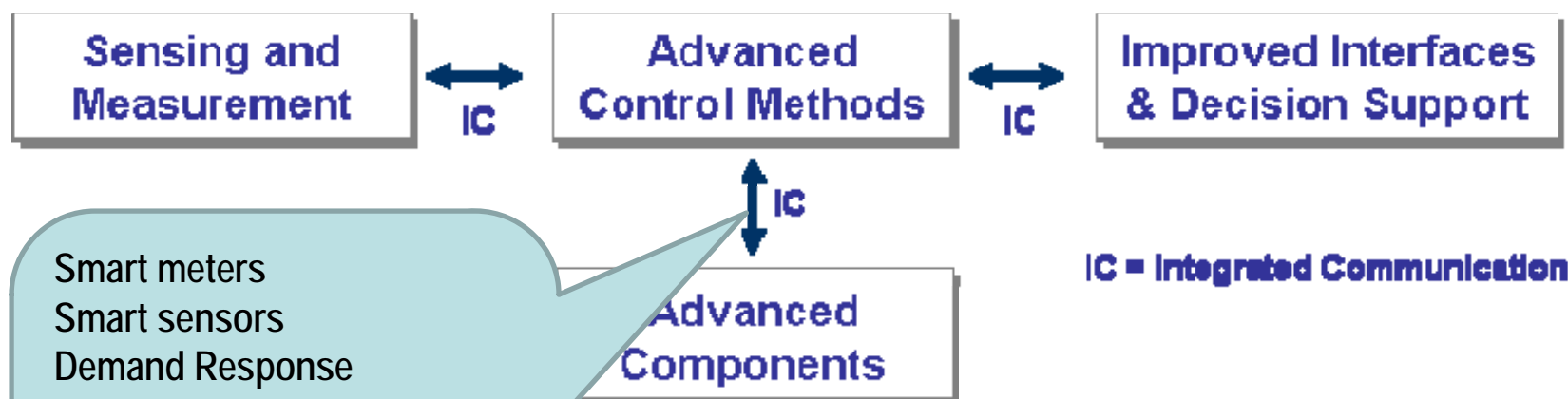
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# Smart Grid Key Technology Areas



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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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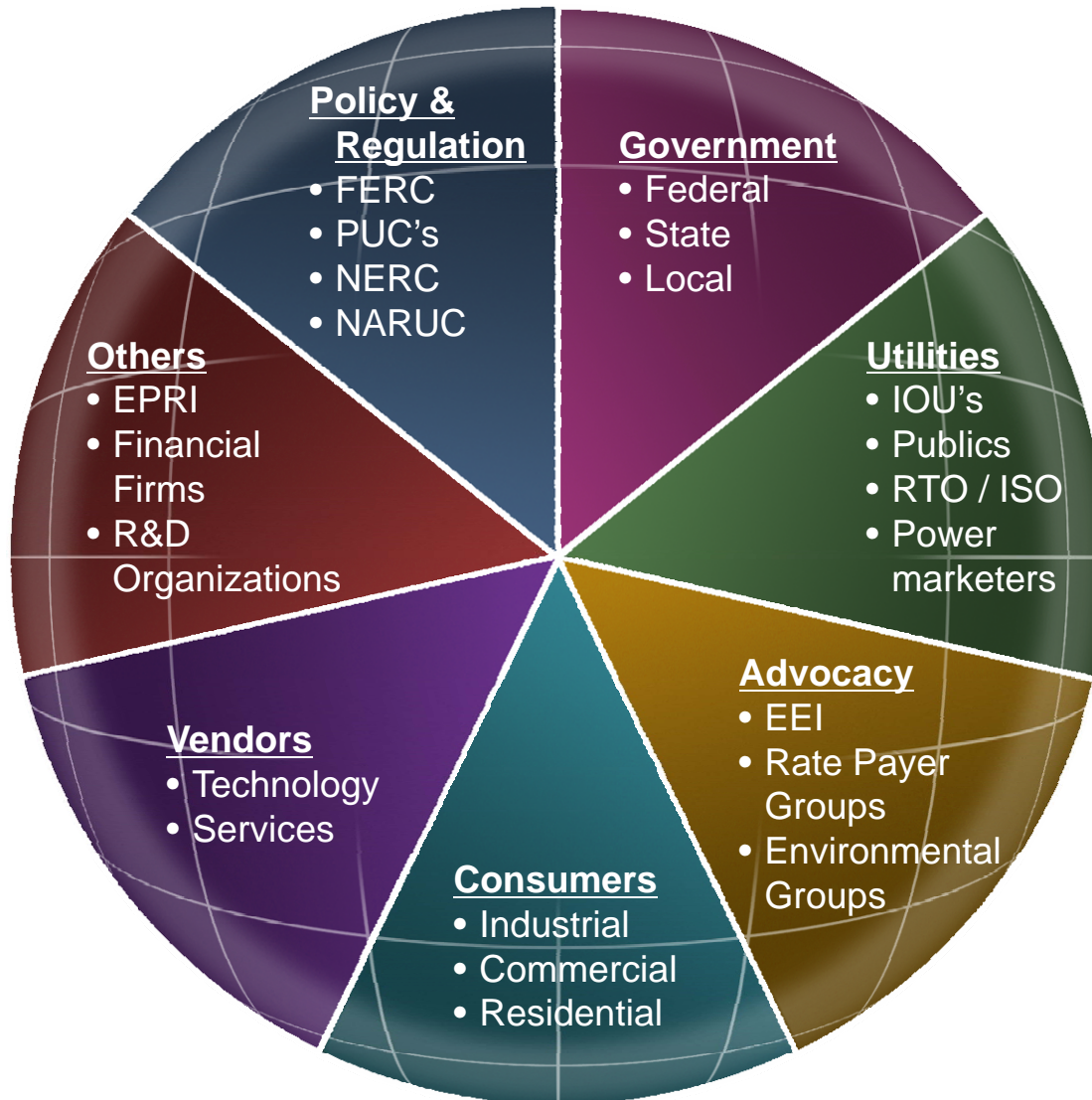
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Who are some of the players?



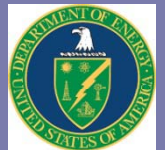
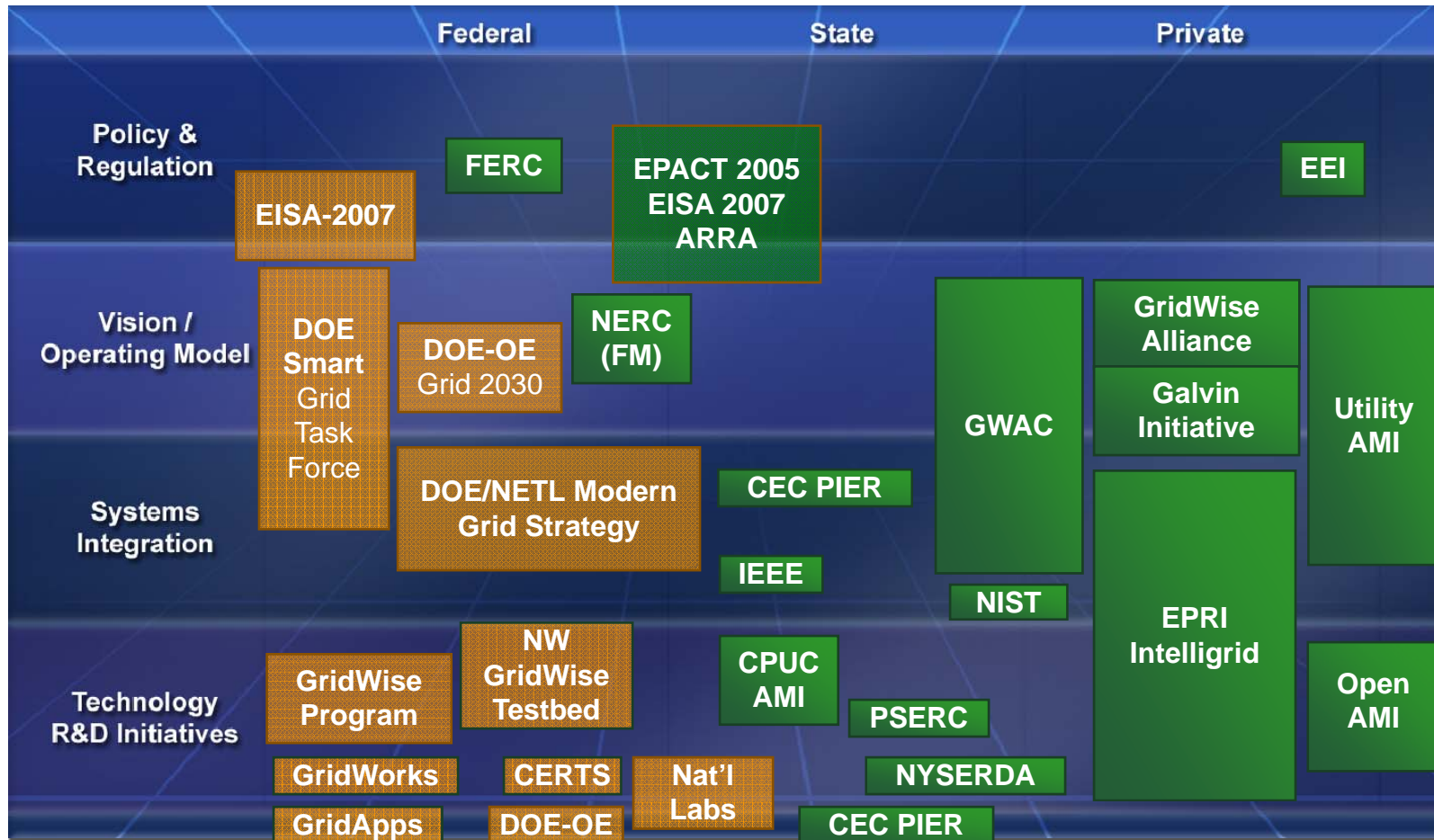


# Smart Grid Stakeholders



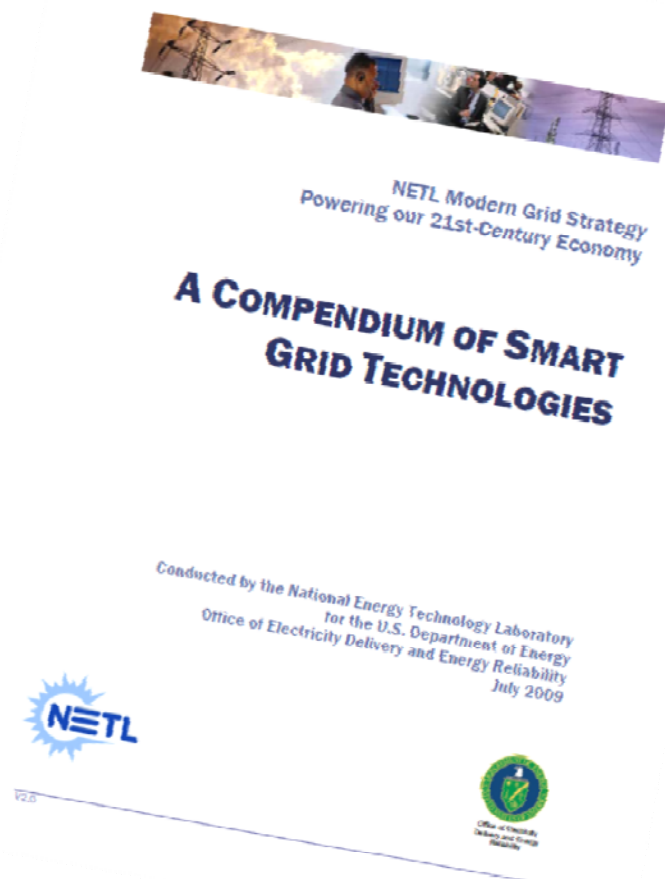
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# Smart Grid "Developers"



# Compendium of Smart Grid Technologies

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



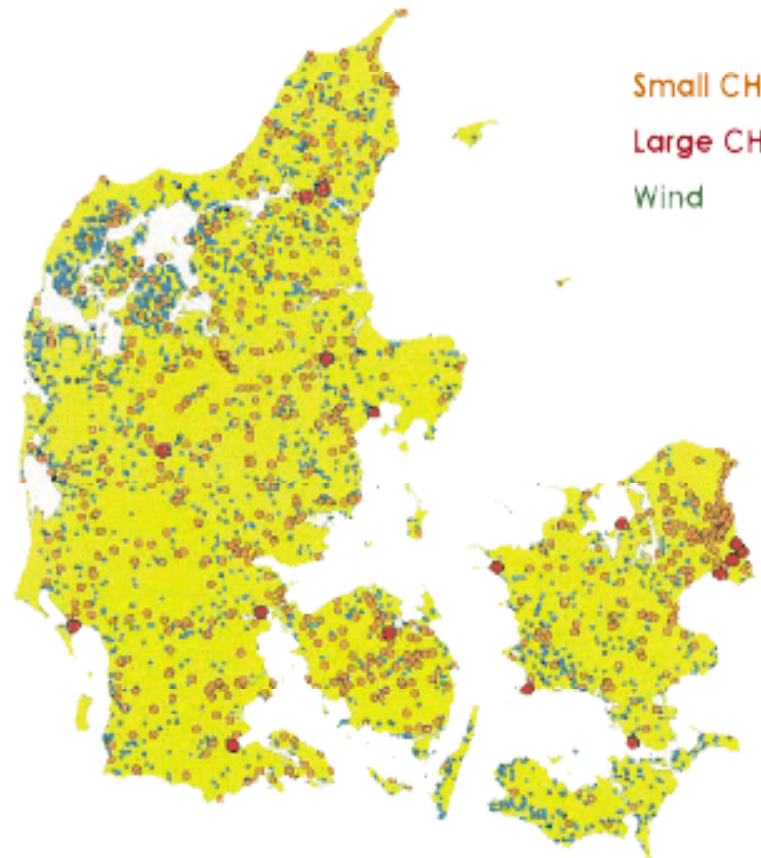
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# Denmark Changed in Two Decades

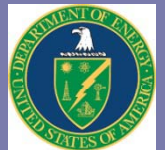
Centralized System of the mid 1980's



More Decentralized System of Today



Source: Danish Energy Center



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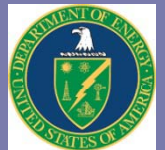
# Contact Information

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

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

**304-599-4273 x101**



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Questions?

