



U.S. Department of Energy

Office of Electricity Delivery and Energy Reliability

# *Smart Grid Activities at the Department of Energy*

**Presentation at:**

**National Broadband Plan Workshop:  
Energy, Environment, and Transportation**

**Eric Lightner**

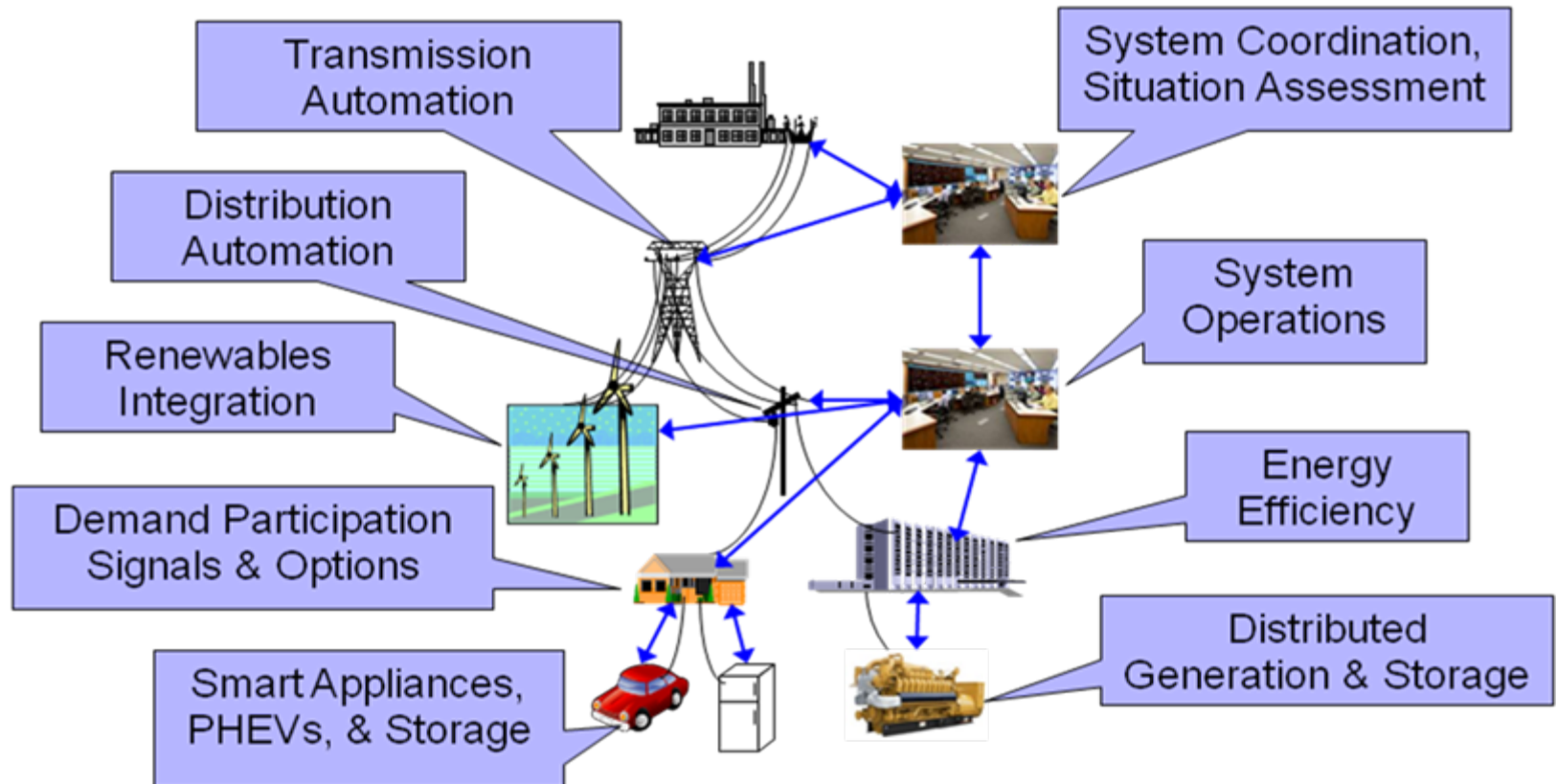
**Director, Smart Grid Task Force**

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# Defining a Smart Grid

An enabling platform that integrates the latest digital and information technologies into the nation's electric delivery network for enhanced operational intelligence and connectivity throughout all application areas



## Key SG Application Areas



# Defining Smart Grid Characteristics

Electricity delivery network modernized using latest digital/information technologies to meet key defining functions

- Enabling Informed Participation by Customers
- Accommodating All Generation and Storage Options
- Enabling New Products, Services, and Markets
- Providing the Power Quality for the Range of Needs in the 21st Century
- Optimizing Asset Utilization and Operating Efficiently
- Addressing Disturbances – Automated Prevention, Containment, and Restoration
- Operating Resiliently Against Physical and Cyber Attacks and Natural Disasters

*7 smart grid characteristics reaffirmed through the Smart Grid Implementation Workshop held June 2008*



# Smart Grid Task Force

Established under authorization of EISA 2007 to ensure awareness, coordination, and integration of the diverse smart grid activities in the Federal Government

## Functions

- ✓ Serves as Federal focal point on all things “smart grid”
- ✓ Coordinates and integrates inter-governmental activities
- ✓ Oversees report production for submission to Congress
- ✓ Collaborates on interoperability framework
- ✓ Guides ARRA investments in smart grid
- ✓ Ensures awareness of Federal smart grid activities
- ✓ Collaborates with and supports the Electricity Advisory Committee

## Member Organizations

DOE (OE / EERE / NETL)  
FERC  
DOC (NIST, ITA)  
EPA  
DHS  
USDA  
DoD  
FCC

## Website

[www.oe.energy.gov/smartgrid\\_taskforce.htm](http://www.oe.energy.gov/smartgrid_taskforce.htm)

- ✓ Charter
- ✓ Presentations
- ✓ Publications
- ✓ Events

# Reports to Congress



## Smart Grid System Report

July 2009

- **State of smart grid deployments**
  - Applying 20 metrics— indicators of deployment progress by penetration levels or maturity levels
  - Metrics crosscutting smart grid scope areas and characteristics
- **Challenges to smart grid deployments**
  - Costs and their recovery
  - Interoperability standards
  - Technical barriers
  - Changing technologies and policies

## Securing the Smart Grid

Draft under DOE review

- **Address how smart grid can help in:**
  - Reducing vulnerability to disruptions from intentional acts
  - Restoring the integrity subsequent to disruptions
  - Facilitating nationwide, interoperable emergency communications and control during times of emergency
- **Assess risks of vulnerability and security threats from smart grid systems and their mitigation activities**



# OE Recovery Act Smart Grid Funds: \$4.5 Billion

Office of Electricity Delivery and Energy Reliability	\$ Millions
<b>Smart Grid Investment Grant Program; ≤3 years</b>	<b>\$3,400</b>
Smaller projects, \$300K-\$20M; 40% of funding	
Larger projects, \$20M-\$200M; 60% of funding	
<b>Smart Grid Demonstrations; 3-5 years</b>	<b>\$700</b>
Regional Demonstrations, up to \$100M per project	
Grid-scale Energy Storage Demonstrations	
<b>Resource Assessment and Interconnection-Level Transmission Analysis and Planning</b>	<b>\$80</b>
<b>State Electricity Regulators Assistance</b>	<b>\$50</b>
<b>Enhancing State Government Energy Assurance Capabilities and Planning for Smart Grid Resiliency</b>	<b>\$55</b>
<b>Workforce Development</b>	<b>\$100</b>
<b>Interoperability Framework Development by NIST</b>	<b>\$10</b>



# Smart Grid Information Sharing & Global Outreach

## Smart Grid Information Clearinghouse

- Competitive award to the Virginia Tech Team to establish the clearinghouse as a central repository for smart grid information, including all Recovery Act smart grid projects
- Responding to a high priority identified by the NARUC/FERC Smart Grid Collaborative & Electricity Advisory Committee
- A Clearinghouse User Group comprising key stakeholder groups being assembled to guide collaborative development

## Smart Grid Maturity Model

- Create and use the Maturity Model approach to:
  - Unite and define all components of the Smart Grid journey ... business, policy, social, technical... into a comprehensive framework for discussion, decision making, and measurement
  - Implement a global open stewardship process and body
- Engaging WEC and CMU/SEI for long-term stewardship and growth



# National Broadband Accelerates Building a Smart Grid Infrastructure

**Joint planning and implementation in Recovery Act activities and Smart Grid R&D to build out the next-generation, integrated electricity/communication infrastructure**

- Broadband linking smart meter networks to utility control centers for home energy monitoring/management applications (demand response, charging/discharging of PEVs, etc.)
- Efficiently using an integrated broadband/smart grid infrastructure to facilitate connectivity for multiple services and applications; installing broadband conduits while upgrading and/or constructing transmission and distribution lines
- Broadband providing smart grid monitoring and management capabilities by linking all sensors, controls, and devices on transmission and distribution grid
- Broadband providing middle-mile connectivity to all localities to enable nationwide, interoperable communications and control of the nation's electricity system
- Broadband providing high speed/capacity needed for robust cyber security measures





# Contact Information

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For more Smart Grid Information:

OE: [www.oe.energy.gov](http://www.oe.energy.gov)

Smart Grid: [www.oe.energy.gov/smartgrid.htm](http://www.oe.energy.gov/smartgrid.htm)

Smart Grid Task Force: [www.oe.energy.gov/smartgrid\\_taskforce.htm](http://www.oe.energy.gov/smartgrid_taskforce.htm)