



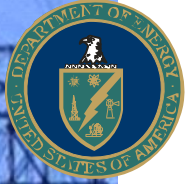
GridWise at DOE

Presented by:

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U.S. Department of Energy

2006 GridWise Expo
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Overview



- **Office of Electricity Delivery & Energy Reliability (OE)**
 - Mission
 - Organizational Structure
 - Funding Profiles
- **Federal Perspective**
- **GridWise History**
- **GridWise Impact**
- **Current GridWise Projects**
- **Contact/Web Info**



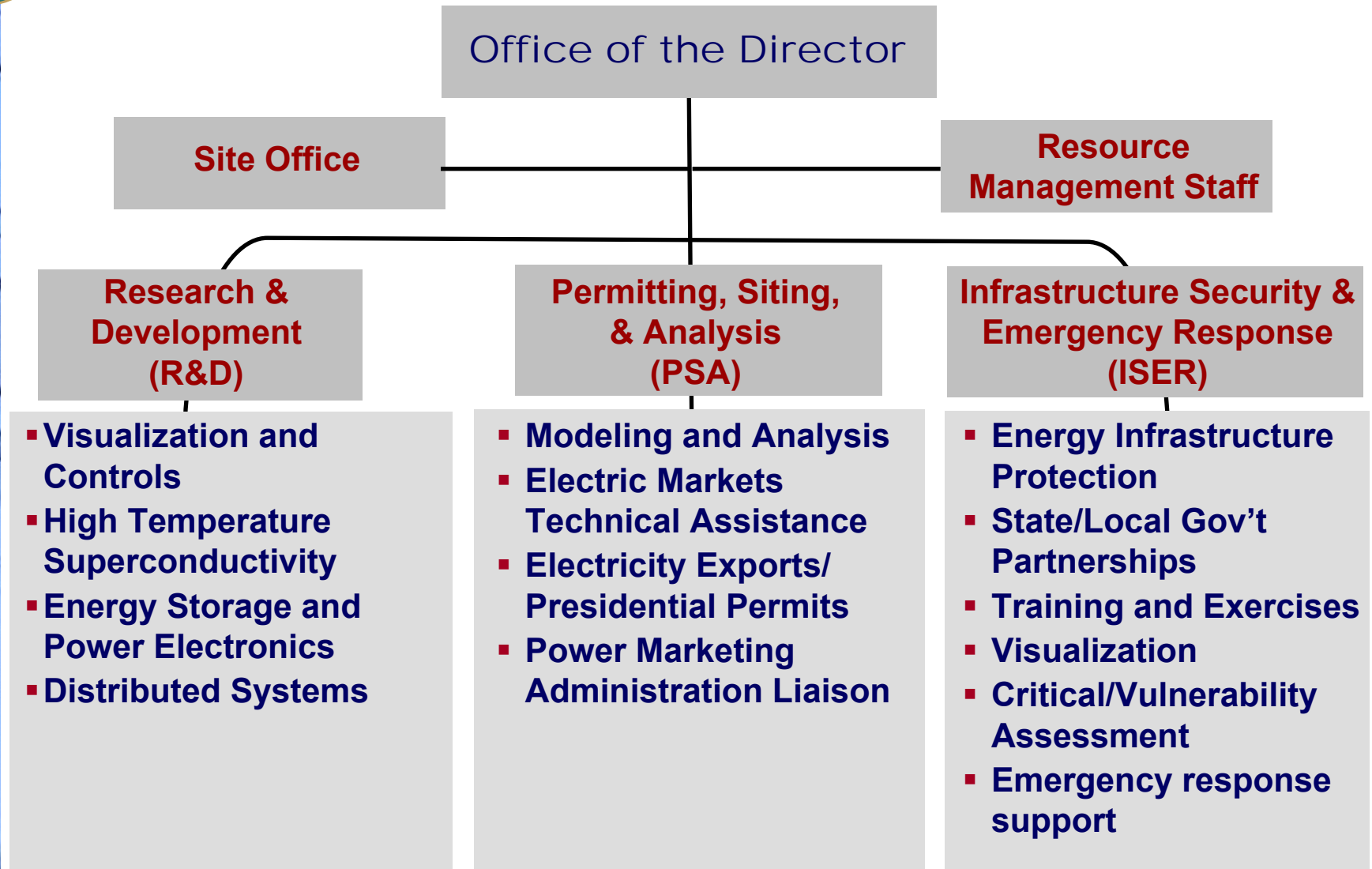
Office of Electricity Delivery and Energy Reliability

Mission

Lead national efforts to modernize the electric grid, enhance security and reliability of the energy infrastructure, and facilitate recovery from disruptions to energy supply.



Office of Electricity Delivery and Energy Reliability





OE Funding Summary

(\$000)

Activity	FY04	FY05	FY06
Superconductivity	37,150	54,562	49,995
Transmission Reliability	11,431	15,600	12,870
Electric Distribution R&D	14,155	17,322	70,454
Energy Storage	8,763	3,969	2,970
Electricity Restructuring	19,351	19,842	12,276
Construction	736	769	0
Program Direction	9,627	8,135	13,313
Totals	101,213	120,199	161,878

FY07 Congressional Budget Request

- \$96M requested for R&D (same level as FY06 request)



GridWise

What is it, anyway?

- **Belief** – information technology will transform the planning and operation of the power grid
- **Concept** – realization of a modern grid utilizing an information superhighway supporting a smart, dynamic, flexible, plug-and-play environment.
- **Strategy** – to meet the increasingly sophisticated demands of today's businesses and consumers with greater security, fewer disruptions, and faster recovery, to support a growing economy and save \$billions
- **Brand** – created to unite a fragmented industry behind a common goal





Why GridWise, why now?

Business as usual will result in

- Billions spent on assets to meet peak demands
- Higher costs from power disruptions, blackouts, and insufficient power quality
- Vulnerability to terrorist threats and natural disasters
- Drag on global competitiveness
- Limits on regional economic development
- Lost opportunities for business growth and job creation
- Export of high technology industries and jobs

“If the electricity infrastructure of this country is inadequate or in some way excessively costly, it will undermine economic growth, and is therefore a major issue that must be addressed.”

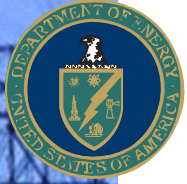
Alan Greenspan, Former Federal Reserve Chairman



Federal Role

- **Catalyze** the transformation of vital infrastructure
- **Consensus** for change needs leadership
- **Competitiveness** of U.S. economy is at stake
- **Consequences** of inaction are high
- **Coordination** required to realize the vision sooner and to ensure equity, efficiency, security & public benefit
- **Coalition** of industry is mobilized to help

"It's clear that the power grid needs ... to be modernized. As we go into an exciting new period of American history, we want the most modern electricity grid for our people ... we need more investment; we need research and development ..." **President George W. Bush, Sept. 2003**



GridWise – History

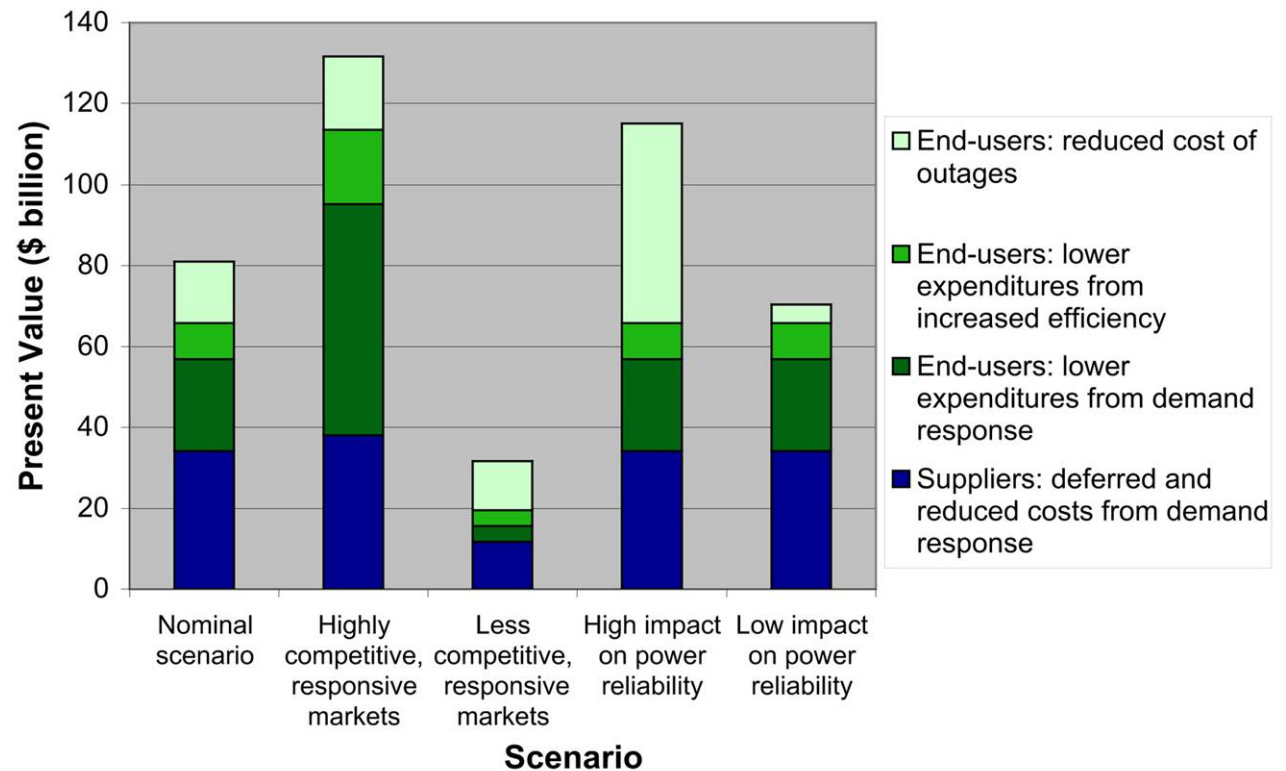
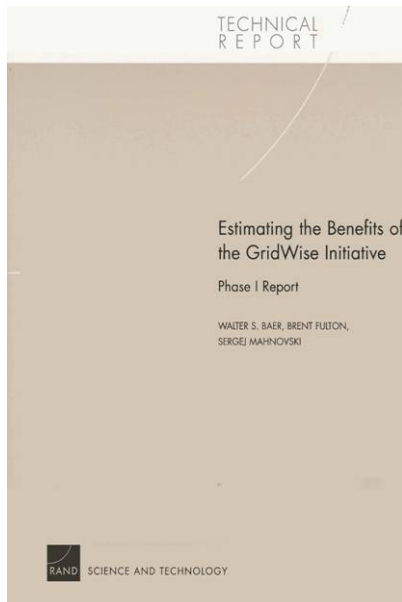
- Initial GridWise vision and concepts conceived under PNNL's Energy Systems Transformation Initiative (ESTI)
- Further development under DOE/PNNL team
 - Program scoping
 - Focus areas
 - Architecture & Communication Standards
 - Distribution Operations, Automation & Load Management
 - Modeling & Simulation
 - GridWise Branding
 - Program benefits
 - Facilitation of GridWise™ Alliance establishment in 9/03
- GridWise officially recognized at DOE in FY04
 - Signed MOU with GridWise Alliance in 3/04
 - Facilitated establishment of GridWise Architecture Council
 - Supporting a portfolio of R&D projects



GridWise Impact

RAND study suggests significant benefits from GridWise implementation, assuming a 20-yr phase-in period under defined penetration scenarios

- Present value of all benefits range from \$40B to \$140B
- Deferred capital investments represent \$20B to \$100B



Estimating the Benefits of the GridWise Initiative: Phase I Report, RAND, TR-160-PNNL, May 2004



Current Portfolio of Projects

- **GridWise Architecture & Standards**
 - Facilitation support to GWAC and Standards development, PNNL

- **Distribution Operations, Automation & Load Management Technologies**
 - Northwest GridWise testbed demonstration, PNNL
 - GridWise demo in NM, Energy Controls
 - Advanced protection methods implemented on SCE's Circuit of the Future, Southern California Edison
 - Development and demonstration of advanced monitoring systems for fault location, analysis, and prediction, EPRI Solutions
 - 3G System of the Future, Infotility/ConEdison

- **Modeling & Simulation**
 - Integrated Distribution Management System (IDMS), Southern Company Services, Inc.



Contact Information

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For more Office/Program information please see,

OE

<http://www.electricity.doe.gov/>

Electric Distribution/GridWise

<http://www.electricdistribution.ctc.com/>

GridWise Architecture Council

<http://www.gridwiseac.org/>

GridWise™ Alliance

<http://www.gridwise.org/>

GridWise Bringing the Electric System into the Information Age

FACT:

In the next 20 years, the U.S. will spend \$450B on electric infrastructure, just to meet load growth.



CHOICE:

Perpetuate a 20th Century solution

OR

Invest in a 21st Century system saving ratepayers \$100B while increasing reliability and flexibility.

GRIDWISE :

Revealing Values +
Communications +
Advanced Controls
≡ Electric infrastructure

The choice is
easy because...

\$ bits << \$ iron