


U.S. DEPARTMENT OF  
**ENERGY** | Energy Efficiency &  
Renewable Energy



*Improving Energy Efficiency with  
Information and Communications  
Technology*

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**EERE Envisions a Sustainable  
Energy Future**

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**Mission**

*The Office of Energy Efficiency and Renewable Energy (EERE) works to strengthen the United States' energy security, environmental quality, and economic vitality in public-private partnerships.*

It supports this goal through:

- Enhancing energy efficiency and productivity;
- Bringing clean, reliable and affordable energy technologies to the marketplace; and
- Making a difference in the everyday lives of Americans by enhancing their energy choices and their quality of life.

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## Technologies and Energy Policies Support ICT and Energy Efficiency

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<h3>Buildings</h3> <ul style="list-style-type: none"> <li>• Smart Building Systems</li> <li>• User Interface</li> <li>• Smart Meters</li> <li>• Smart Appliances</li> </ul>	<h3>Transportation</h3> <ul style="list-style-type: none"> <li>• Smart Infrastructure</li> <li>• Vehicle Computers &amp; Smart Cars</li> <li>• Public Transit (Metro SmartTrip, EZ-Pass)</li> </ul>
<h3>Industry</h3> <ul style="list-style-type: none"> <li>• Distributed Generation</li> <li>• Smart Sensors/Controls</li> <li>• Energy Management</li> <li>• Data Centers</li> </ul>	<h3>Power</h3> <ul style="list-style-type: none"> <li>• Smart Grid</li> <li>• Renewable Electricity Grid Integration</li> <li>• Utility Decoupling</li> <li>• Demand Side Management</li> </ul>

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## Why ICT is So Powerful

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Information and Communication Technologies are

- Ubiquitous – they are everywhere
- Catalytic – they alert, inform, and inspire
- Instrumental – they can act for us
- Diligent – they log, record, document, and report
- Intelligent – they learn

***These features of ICT can be a very powerful influence for energy efficiency. Only humans do a better job (sometimes)***

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## Recovery Act Funded ICT Projects



- **Energy Efficient Information and Communication Technology (ICT)**
  - \$50 Million
  - Run by the DOE/EERE Industrial Technologies Program
  
- **Smart Grid Investment Grant Program**
  - \$3.375 Billion
  - Run by Office of Electricity Delivery and Energy Reliability
  
- **Recovery Act Smart Grid Demonstration Program**
  - \$615 Million
  - Run by Office of Electricity Delivery and Energy Reliability

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## Technologies and Energy Policies Support ICT and Energy Efficiency



### Buildings

- ICT is the interface between users and buildings
- Smart Building Systems
  - DOE's Net-Zero Energy Commercial Building Initiative & High Performance Buildings Partnership
- Smart Meters & Appliances
  - ICT helping consumers make smart choices

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### Transportation

- Smart Infrastructure
  - Traffic management
- Vehicle Computers & Smart Cars
  - ICT improves on-board monitoring and consumer interface
- Public Transit
  - Metro SmartTrip
  - EZ-Pass tolls

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### Industry

- Energy Management at Federal Facilities
  - Run by Federal Energy Management Program (FEMP)
  - Includes High-Performance Building Design, Operation, and Maintenance & Energy-Efficient Product Procurement
- Data Centers
  - *Save Energy Now* Data Center Energy Efficiency Program
  - Federal Energy Management Program's (FEMP) Transformational Energy Action Management (TEAM) Initiative
  - Federal Partnership for Green Data Centers
  - Memorandum of Understanding (MOU) with The Green Grid Association (Sept. 2007)
- Distributed Generation
- Smart Sensors/Controls

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## \$50 Million for Energy Efficient ICT

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- Funding Opportunity Announcement (FOA) issued and closed on July 21, 2009
- Application reviews are in process
- 5-15 awards expected to be awarded
- Non-federal cost share is required (10-50% depending on project type)

- Seeks to develop new technologies to dramatically improve energy efficiency in ICT
  - Emphasis on new technologies that can be commercialized within the next 3-5 years
- 3 Broad Areas of Interest:
  1. Concept Definition Studies for Energy Efficient Information and Communications Technology (maximum \$300K per award)
  2. Information and Communications R&D For Energy Efficiency (maximum \$10M per award)
  3. Demonstration and Field Testing of Highly Energy Efficient and Emerging Technologies for Data Center or Telecommunications Use (maximum \$10M per award)

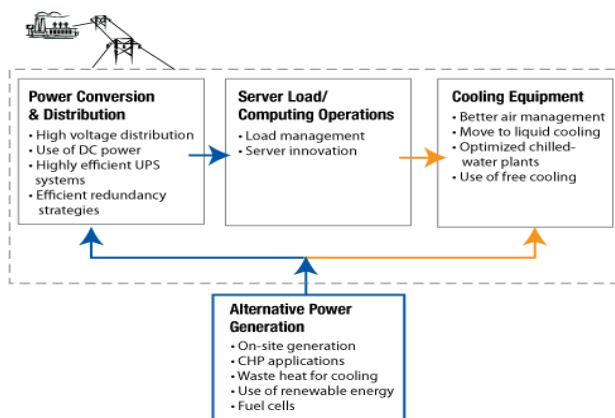
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## Save Energy Now Data Center Energy Efficiency Program

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Save Energy Now actively targets energy savings potential in 4 main data center areas:



**Save ENERGY Now**®

### Goals by 2011

- Save 10% of energy use by data centers
- Complete training for 3000 data centers
- Complete assessment protocols and tools for 1,500 data centers
- Certify 100 qualified specialists

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**Technologies and Energy Policies Support ICT and Energy Efficiency**

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### Power

- Smart Grid
- Renewable Electricity Grid Integration
  - DOE programs actively working to integrate with building energy management, loads, energy storage, advanced communication controls, and balance-of-systems functionality
- Utility Decoupling
- Demand Side Management
  - Utilities getting the consumers involved

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**What is Smart Grid?**

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*A smart grid is the electricity delivery system (from point of generation to point of consumption) integrated with communications and information technology for enhanced grid operations, customer services, and environmental benefits.*

**ICT plays a part across Smart Grid**

**Security**

**Smart grid applications**

**Applications that create electrical system/societal value**

**Computing / information technology**

**Information for timely decision making**

**Communications Infrastructure**


**Enabling communication to entire energy supply chain**

**Energy Infrastructure**

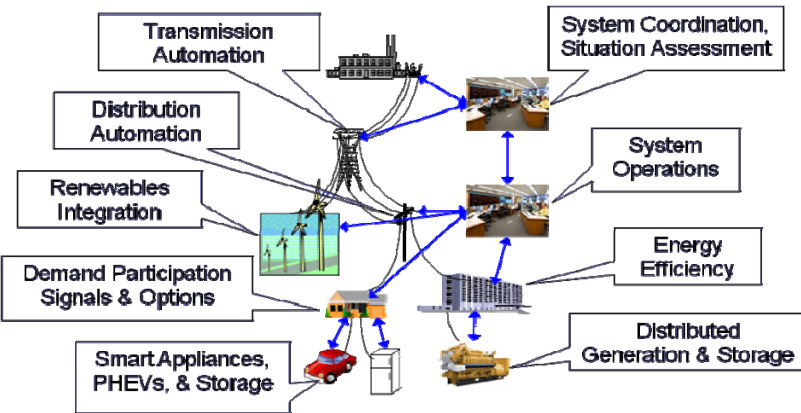
**Physical infrastructure that distributes energy**

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## Examples of Smart Grid Projects



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Projects that can integrate advances in digital and information technology into the nation's electric delivery network for enhanced operational intelligence and connectivity



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## Recovery Act Smart Grid Investment Grant Program


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- Competitive, merit-based solicitation; more than 431 proposals received now under review for fall 2009 award
- Covers electric transmission, distribution, and customer-side applications
- Deployment of Phasor Measurement Units (PMU) within the transmission system is a specific program goal

**Eligibility and Funding**

- \$3.375 billion available
- Applications expected from eligible entities such as electric utilities, load serving entities, appliance and equipment manufacturers, and IT vendors
- National Laboratories and Federally Funded Research and Development Centers are NOT eligible
- Expected project awards range from \$100,000 to \$5,000,000 for PMU projects; \$500,000 to \$200,000,000 for others
- Funding provided for up to 50% of qualified investments requested by grant applicants

**Anticipated Schedule**

Activity	Date
Funding Opportunity Announcement (FOA) - Round 1	June issuance, Now closed, 431 proposals totaling \$24.7 billion
FOA - Round 2	Proposals due Dec 15; but may cancel Round 2
FOA - Round 3	CANCELLED
Award date	Fall 2009

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## Recovery Act Smart Grid Demonstration Program

- Competitive, merit-based solicitation; 140 awards proposals received now under review for fall 2009 award**
- Covers electric transmission, distribution, and customer-side projects at a scale that can be replicated across the country**
- Scope includes (1) Regional smart grid demonstrations, (2) Utility-scale energy storage demonstrations, (3) Grid monitoring demonstrations**

**Eligibility and Funding**

- \$615,000,000 available
- Expect applications from all types of organizations including state and local agencies, universities, electric utilities, equipment manufacturers, and project developers
- Other Federal agencies, National Laboratories, Federally Funded Research and Development Centers, certain non-profits that engaged in lobbying activities after December 31, 1995 are NOT eligible
- Applicant's cost share must be at least 50% of the total allowable costs
- Expect to fund: 8-12 regional demonstrations, 12-19 energy storage projects, and 4-5 grid monitoring projects

**Anticipated Schedule**

<i>Activity</i>	<i>Date</i>
Funding Opportunity Announcement (FOA)	Issued June 2009, Now closed, 140 proposals received totaling \$8.5B
Project Awards	To be announced shortly

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## Policies Can Support the Key Features of ICT

- Ubiquitous**
  - Policy can help expand the scope and reach of ICT: more advanced meters; more smart buildings; etc.
- Catalytic**
  - The private sector, with the proper incentives, can help ICT be more catalytic and informative, taking account of human behavior, and developing new business models for energy efficiency
- Instrumental**
  - Policy can improve the power of ICT tools through standards, such as interoperability, that ensure safety, security, and privacy
- Diligent**
  - Policy can create incentives for more data collection, encourage sharing, and support analysis of energy efficiency data
- Intelligent**
  - Policy can support increased R&D for ICT

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*Thank You!*

Any Questions?