### OFFICE OF ENERGY EFFICIENCY AND RENEWABLE ENERGY

#### ENERGY EFFICIENCY
- Advanced Manufacturing
- Building Technologies
- Federal Energy Management
- Weatherization & Intergovernmental

#### RENEWABLE ENERGY
- Geothermal Technologies
- Solar Energy Technologies
- Wind & Water Technologies

#### TRANSPORTATION
- Biomass & Biorefinery Systems
- Hydrogen & Fuel Cell Technologies
- Vehicle Technologies

- Advanced Manufacturing
- Sustainability Performance
- Strategic Programs
Strategic Programs’ Role in EERE

The Office of Strategic Programs accelerates development, commercialization and deployment of EE/RE technologies by communicating and leveraging crosscutting opportunities within the EERE portfolio and providing a strong foundation and best practices for strategic planning, implementation and decision making.

Strategic Programs Objectives:

- Provide a consistent, objective and credible analysis underpinning for EERE.
- Promote innovation and accelerate adoption of energy efficiency and renewable energy technologies.
- Advance the progress of EERE’s domestic R&D programs and accelerate global deployment of U.S.-made clean energy technologies through international collaboration.
- Provide accessible, sound, reliable information on energy technologies and systems and their evolution, and further promote energy awareness.
Strategic Priorities and Impact Analysis

Objectives:

- Inform EERE corporate decisions and program implementation through a portfolio perspective
- Explain EERE impact on US energy system, economy, jobs, and environment
- Increase the transparency, rigor, and utility of EERE data and analysis tools, using state-of-the-art methods
- Guide program evaluations

The Transparent Cost Database collects program cost and performance estimates for EERE technologies in a public forum where they can be viewed and compared to other published estimates. The BITES Tool is a scenario-based analysis tool to explore how changes in energy demand and supply by economic sector potentially impact CO₂ emissions.

http://en.openei.org/apps/TCDB/

https://bites.nrel.gov/index.php
**Innovation & Deployment**

**Promote innovation and accelerate adoption of energy efficiency and renewable energy technologies.**

**Challenges**
- Small businesses face challenges in financing the development and deployment of clean energy technologies.
- New ventures often lack the business savvy and access to investors necessary to succeed.
- Communities lack knowledge and tools to select effective energy portfolios or prioritize investments across varied technologies.
- The currently available skilled clean energy workforce is inadequate.
- Reach of EERE information is hindered by limited use of state-of-the-art tools and software.

**Objectives:**
- Support small business innovative research and technology commercialization
- Help create ecosystems that can move innovative technologies into the market faster
- Transform the energy market through a community-based planning and deployment approach
- Develop and implement advanced workforce education/training tools and methods
- Develop and distribute interactive applications, tools and content across EERE, DOE and the Nation
Small Business Innovation Research (SBIR) and Small Businesses Technology Transfer Research (STTR)

Structure:
- Phase I: $150-225K, 1 yr
- Phase II: $1.0-1.5M, 2 yrs

### Fiscal Year 2013 Schedule

<table>
<thead>
<tr>
<th></th>
<th>Phase I</th>
<th>Phase II</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Release 1</td>
<td>Release 2</td>
</tr>
<tr>
<td>Pre-Release</td>
<td>07/16/12</td>
<td>10/29/12</td>
</tr>
<tr>
<td>FOA Release</td>
<td>08/13/12</td>
<td>11/26/12</td>
</tr>
<tr>
<td>Pre-Apps Due</td>
<td>09/04/12</td>
<td>12/17/12</td>
</tr>
<tr>
<td>Applications Due</td>
<td>10/16/12</td>
<td>02/05/13</td>
</tr>
<tr>
<td>Award Notification</td>
<td>~01/13*</td>
<td>~05/13*</td>
</tr>
<tr>
<td>Grant Start Date</td>
<td>~02/13*</td>
<td>~05/13*</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Release 1</td>
<td>Release 2</td>
</tr>
<tr>
<td>FOA Issued</td>
<td>10/22/12</td>
<td>02/27/13</td>
</tr>
<tr>
<td>Applications Due</td>
<td>12/11/12</td>
<td>04/17/13</td>
</tr>
<tr>
<td>Award Notification</td>
<td>~02/13*</td>
<td>~06/13*</td>
</tr>
<tr>
<td>Grant Start Date</td>
<td>~03/13*</td>
<td>~07/13*</td>
</tr>
</tbody>
</table>

### Success Stories

- **A123 Systems**, 2003 SBIR Phase I grantee, developed *Advanced Li-Ion Batteries*. By the time of the 2006 DOE survey, it already had sales 35 times greater than the DOE investment. Early sales were for cordless power tool batteries; now the batteries are in hybrid vehicles.

“Beyond SBIR”

- EERE supports the **Clean Energy Alliance** to link small businesses with incubators and facilitate commercialization. **LoadIQ**, 2012 SBIR Phase I grantee, developed *Utility Accountant* technology, which enables consumers to see their energy use itemized in real time and reduce their energy costs. Recently raised $1.1M from public and private sector sources and landed pre-purchase commercial trials for a food service company.
Innovation Ecosystem Initiative

Enabling business mentoring, entrepreneurial fellowships, and business plan competitions to accelerate the movement of innovative efficiency and renewable technologies to the marketplace

Highlights:
• Competitively selected 5 ecosystems that include 80+ partners and client companies
• ~$30,000,000 in private-sector funding, >$3,000,000 in additional federal funding, >25 start-up companies; examples:
  • FirstFuel Software raised >$12M in venture capital to develop remote building energy audit business
  • Clean Urban Energy raised >$7M to incorporate building energy use into its smart grid software

Five 3-Year Regional Projects Awarded in 2010
Total DOE Funding: $5,240,641
National Clean Energy Business Plan Competition

Part of the White House Startup America initiative to celebrate, inspire, and accelerate entrepreneurship throughout the nation

Approach: convene venture capitalists, thought leaders from the energy industry and government, and the nation’s most promising young business minds to connect student-led teams with the resources and expertise their startups need to succeed

Progress & Plans:
• More than 275 student teams competed in the 6 regional competitions.
• The winner from each of those competitions received $100,000 in DOE prize money.
• Participating teams have raised more than $800,000 of follow-on funding since March 2012.
• 30+ startups have been incorporated and 120+ startups have received entrepreneurial services because of the initiative
• 10+ sponsors supported the National Competition
# National Business Plan Competition - Winners

## Western Southwest Region

**SolidEnergy** (MIT) - battery innovation that improves safety and energy density of rechargeable lithium batteries – intended to extend deployment of electric vehicles.

## Northeast Region

**Radiator Labs** (Columbia University) - a low-cost radiator retrofit that converts steam radiator heating systems into a controlled zoned system, increasing efficiency of heating and occupant comfort.

## Western Region

**Stanford Nitrogen Group** (Stanford University) - new wastewater treatment process that removes and recovers energy from waste.

## Southeast Region

**Mesdi Systems** (University of Central Florida) – precision electrospray tools that increase production capacities and reduce costs for clean energy manufacturing.

## Western Midwest Region

**Navillum Nanotechnologies** (University of Utah) - low cost commercial scale production of semiconducting nanocrystals for energy efficient products (TVs, tablet displays, and LED lighting) and to improve energy-harnessing capabilities of solar panels.

## Eastern Midwest Region

**NuMat Technologies** (Northwestern University) - nanomaterial (metal-organic framework) that stores gases at lower pressure, reducing infrastructure costs and increasing design flexibility (e.g., natural gas tank and storage).

### NATIONAL WINNER of >$180,000 worth of prizes:
- $100,000 in seed funding
- Technical and commercialization assistance
- 30 hours of legal assistance (Mintz Levin)
- 40 hours of advisory services (Battelle Ventures)
A partnership with DOC Economic Development Administration to support three regional proof of concept centers in green innovation to improve competitiveness and create jobs

Progress & Plans:

• Region-specific centers that provide services to clean energy ventures:
  • Washington focuses on energy efficiency in buildings
  • Florida targets technologies from partner universities, linkages with Kennedy Space Center
  • New England collaborates with Fraunhofer ecosystem, focuses on economic expansion throughout New England

• Florida I2 CAN creating a “gap fund” to invest in clean energy startups

• Washington Clean Energy Partnership is working with Microsoft to create campus energy management test bed facility with Seattle City Light

• Cleantech Innovations New England provides entrepreneurial services to business plan competition winners, thereby accelerating commercial success.
Energy Innovation Portal

Web application bridging the information gap between commercial partners and DOE-created technologies that are covered by more than 16,000 issued patents and patent applications.

The Portal includes 640+ business-friendly technology summaries that the provide high-level descriptions, benefits and potential applications of the technologies.

Designed to support...
- Investors
- Corporate Technology Scouts
- Entrepreneurs
- Innovators
- Knowledge Seekers
- Builders
- Scientists
- Analysts

Provides....
- Faceted search and browse
- Authorized API
- Distributed Content Widgets
- Lead Tracking
- Contextualized Patent Search
- Patent Taxonomy
Integrated Deployment

EERE’s community-based approach to assist in the deployment of energy efficiency and renewable energy technologies in high energy cost regions.

Accomplishments

- **Hawaii** -- Facilitated private capital project growth in HI from $300M in 2009 to $1.2B in 2011 under Hawaii Clean Energy Initiative (HCEI)
- **Alaska** -- Installed 17 MW of wind power on Fire Island
- **Polar Regions** -- Supported Summit Station EE & RE development
- **US Virgin Islands** -- Proved viability of electric system interconnection between USVI and Puerto Rico
Advance the progress of EERE’s domestic R&D programs and accelerate global deployment of U.S.-made clean energy technologies through international collaboration.

**Bilateral Partnerships**
- China
- India
- Brazil
- Israel
- EU
- United Arab Emirates
- Canada
- Japan
- Mexico
- Korea
- Russia
- Kazakhstan

**Multilateral Partnerships**
- APEC – Asia-Pacific Economic Cooperation
- CEM – Clean Energy Ministerial
- ECPA – Energy and Climate Partnership for the Americas
- EDIN – Energy Development in Island Nations
- IEA Working Groups and Implementing Agreements
- IPEEC – International Partnership for Energy Efficiency Cooperation
- IPGT – International Partnership for Geothermal Technology
- IPHE – International Partnership for Hydrogen and Fuel Cells in the Economy
- IRENA – International Renewable Energy Agency
International Program: Linking Goals to High-Impact Activities

Support High-level Goals

• “U.S. leadership through the Department can help promote clean energy technologies around the world...International partnerships could offer more diverse projects to increase learning rates, promote the global adoption of clean energy technologies, and perhaps ease foreign market entry for U.S. firms...” -- DOE Strategic Plan, May 2011

Strategies and Means

• Use technical and policy assistance as “market priming” activities to facilitate international business and investment opportunities for U.S. clean tech companies
• Collaborate with Commerce, USTDA, ExIm, and OPIC through formal and informal interagency processes to support President’s National Export Initiative
• Promote the development and implementation of codes and standards (specifically, those prevailing in the U.S.) to provide competitive advantage of U.S. clean energy technologies

High-Impact Activities

• U.S.-China Renewable Energy Partnership. According to MA-based Second Wind, DOE technical workshops have been “vital” to the sale of U.S.-manufactured wind measurement devices to China.
• U.S China Mayors Training visits. AZ-based Solatube, maker of innovative daylighting technology, recorded $4M sale as result of visits.
• Brazil Strategic Energy Dialogue—
  • Building envelope technologies. Introducing U.S.-supported labeling program to promote sale of US goods in rapidly expanding market; industry cost share of 50% to support workshops indicates market relevance and export potential.
• Small wind systems. DOE-supported manufacturers participating in workshop to discuss standards development, testing, certification, wind resource and site assessment, grid infrastructure, incentive programs, and project development opportunities.