

# Towards a Sustainable Energy Mix: the Interplay between Business and Government

U.S. DEPARTMENT OF  
**ENERGY**

Energy Efficiency &  
Renewable Energy



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Global Leadership &  
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- Create stable, long-term incentives
- Develop projects that are self-funded or cheap
- Make America more competitive with a more efficient and productive economy
- Invest in the next generation of scientists and engineers
- Support innovative research and commercialization funding models

***The American Recovery and Reinvestment Act of 2009 is a “kick-start” to the clean energy revolution***

# American Recovery and Reinvestment Act Funding for Energy

| <b>Department of Energy Program Office</b>                        | <b>Recovery Act<br/>(\$ Millions)</b> |
|---|---------------------------------------|
| Office of Energy Efficiency & Renewable Energy                    | \$16,800                              |
| Office of Science   | \$2,000                               |
| Office of Electricity Delivery and Energy Reliability             | \$4,500                               |
| Office of Fossil Energy   | \$3,400                               |
| Office of Environmental Management                                | \$6,000                               |
| <b>DOE TOTAL (Excluding Loans)</b>                                | <b>\$32,700</b>                       |
| Office of the Chief Financial Officer - Technology Loan Guarantee | \$6,000                               |
| Power Marketing Administrations - Borrowing Authority             | \$6,500                               |
| <b>DOE TOTAL (Including Loans)</b>                                | <b>\$45,200</b>                       |

# Recovery Act Funding for Energy Efficiency and Renewable Energy (Directed)

| Office of Energy Efficiency & Renewable Energy     | Recovery Act (\$ Millions) |  |
|--|----------------------------|--|
| <b>EERE Directed Funding</b>                       | <b>\$14,350</b>            |  |
| Energy Efficiency & Conservation Block Grants      | \$3,200                    | \$1.75B obligated by Oct. 28, 2009   |
| State Energy Program                               | \$3,100                    | \$3.07B obligated as of Oct. 28, 2009  |
| Weatherization Assistance Program                  | \$5,000                    | \$4.73B obligated as of Oct. 28, 2009  |
| Energy Star Rebates                                | \$300                      | 10% allocation awards for all entities completed on Sept. 1, 2009                  |
| Transportation Electrification                     | \$400                      | 18 selected projects announced Aug. 5, 2009; All awards completed by Dec. 31, 2009 |
| Clean Cities Alternative Fuels Pilot Program       | \$300                      | 25 selected projects announced on Aug. 26, 2009<br>Awards planned by Dec. 31, 2009 |
| Advanced Battery & Hybrid Components Manufacturing | \$2,000                    | 30 selected projects announced Aug. 5, 2009; All awards completed by Dec. 31, 2009 |

# Funding Opportunity Announcements for Energy Efficiency and Renewable Energy



Energy Efficiency & Renewable Energy

|  |         |   |
|--|---------|---|
| Solar FOAs   |         |   |
| National Lab Call for PV and CSP R&D               | \$17M   | 15 selections announced Oct. 8, 2009  |
| Solar Market Transformation                        | \$20M   | 25 selections announced Oct. 8, 2009  |
| High Penetration PV                                | \$17.5M | 7 selections announced Oct. 8, 2009   |
| Biomass FOAs                                       |         |   |
| Integrated Biorefinery Operation                   | \$480M  | Selections on track for Nov. 20, 2009   |
| Development of Algal / Advanced Biofuels Consortia | \$85M   | Selections delayed beyond Nov. 23, 2009 to get distinguished reviewers        |
| Infrastructure/Intermediate Blends                 | \$20M   | Selection planned for Dec. 22, 2009   |
| Geothermal Technologies FOAs                       | \$338M  | Selections for all 6 FOAs announced on Oct. 29, 2009                          |
| Hydropower FOAs                                    |         |   |
| Conventional Hydropower Recovery                   | \$32M   | 7 selections announced on Nov. 4, 2009  |
| Wind FOAs  |         |   |
| Large Dynamometer Wind Testing Facility            | \$45M   | Selections planned for Nov. 15, 2009  |
| Massachusetts Large Blade Testing Facility         | \$25M   | Awarded on Aug 31, 2009; Groundbreaking event planned for early December 2009 |
| Wind University                                    | \$24M   | Selections announced Oct. 15, 2009  |
| Industrial Technologies FOAs                       |         |   |
| Information and Communication Technology           | \$50M   | Selection announcement planned Nov. 9, 2009                                   |
| Combined Heat and Power                            | \$156M  | 9 selections announced Nov. 2, 2009   |
| State Save Energy Now                              | \$10M   | 32 selections announced Nov. 3, 2009  |

# Funding Opportunity Announcements (cont.)

|  |                                  |   |
|--|----------------------------------|---|
| Vehicle Technologies FOAs  |                                  |   |
| Commercial Vehicle Integration and Advanced Power Train  | \$240M total (\$110M ARRA funds) | Selections planned for Dec. 15, 2009  |
| XPrize Award   | \$5.5M                           | Announced Nov. 2, 2009  |
| Buildings Technologies FOAs  |                                  |   |
| Solid State Lighting Core Technologies   |                                  | Selections planned for Nov. 2009  |
| Solid State Lighting Product Development   |                                  | Selections planned for Dec. 1, 2009   |
| Advanced Energy Efficient Building Technologies  |                                  | Selections planned for Dec. 17, 2009  |
| Training Program Development for Commercial Building Equipment Technicians, Building Operators, and Energy Commissioning Agents/Auditors |                                  | Selection planned for Dec. 21, 2009   |
| Solid State Lighting U.S. Manufacturing  |                                  | Selections planned for Dec. 23, 2009  |
| Building America Energy Efficient Housing Partnerships   |                                  | Selection planned for Dec. 28, 2009   |
| Other FOAs   |                                  |   |
| Lab Call for Facilities and Equipment  |                                  | Selections scheduled for Nov. 9, 2009   |
| Community Renewable Energy Deployment  |                                  | Selections delayed for reviewer determination                                   |
| Small Business Innovation Research (SBIR)  |                                  | Selections expected early November  |
| Tax Credit Programs  |                                  |   |
| Advanced Manufacturing Tax Credit (48C)  |                                  | 500 applications by Oct. 16, 2009   |
| Direct Tax Payments in Lieu of Tax Credits (1603)  |                                  | Total announced is more than \$1.17 billion for 71 projects, as of Nov. 4, 2009 |

# Recovery Act Funding for Loan Guarantee Programs

| Loan Guarantee Programs  | Recovery Act (\$ Millions) |  |
|--|----------------------------|--|
| Section 1703   | \$51,000                   | 2009 Appropriations Act (\$8.5B) for renewable and/or energy efficient systems and manufacturing, and distributed energy generation, transmission and distribution |
| Section 1705   | \$48,600                   | 2 solicitations open: transmission and innovative energy efficiency and renewable energy   |
| Advanced Technology Vehicles Manufacturing Direct Loan Program | \$25,000                   | 100 applications to date<br>Awards made to Ford, Nissan, Tesla, and Fisker<br>More applications in review on rolling basis   |
| <b>LOANS TOTAL</b>   | <b>\$124,600</b>           |  |

- **Office of Electricity Delivery and Energy Reliability:**
  - Modernize the national electric grid
  - Enhance U.S. energy infrastructure
  - Ensure reliable electricity delivery to meet growing demand
  - Allow for broader use of alternative energy
- **Smart Grid:** These funds support the implementation of the Smart Grid program authorized by the Energy Independence and Security Act of 2007
- **The Recovery Act Provides Specific Funding for Three Areas of Smart Grid:**
  - Development of interoperability standards for Smart Grid devices
  - Workforce training and development
  - Nationwide resource assessment and analysis of future demand and transmission requirement

## Recent Funding Opportunity Announcements (FOAs)

- **\$3.4B Smart Grid Investment Grant Program**
  - *Announced Oct. 27, 2009*
- **\$44.2M State Public Utility Commissions**
  - Awarded on Sept. 21, 2009
- **\$100M Workforce Training for Electric Power Sector**
  - FOA Closes Nov. 30, 2009
- **\$615M Smart Grid Demonstration Projects**
  - closed August 26, 2009
- **\$46M State Electricity Regulators Assistance**
  - closed August 31, 2009
- **\$40M Enhancing State Government Energy Assurance Capabilities and Planning**
  - closed July 30, 2009
- **\$60M Resource Assessment and Interconnection-Level Transmission Analysis and Planning**
  - closed August 14, 2009

- ARPA-E was created by H.R. 364 within the U.S. Department of Energy in 2007, though without a budget.
- \$400 million provided in the Recovery Act

## Goals:

- Reduce foreign energy imports
- Decrease energy-related emissions, including emissions of greenhouse gases
- Increase energy efficiency across the U.S. economy
- Ensure that the U.S. maintains a technological lead in developing and deploying advanced energy technologies

*ARPA-E will uniquely focus on bold, high risk, high payoff concepts - technologies promising true energy transformations*

- April 27, 2009: ARPA-E issued its first FOA for Transformational Energy R&D Projects (\$151M)
- Selected Projects
  - Renewable Power: 4 projects for \$24.5M
  - Biomass Energy: 4 projects for \$21.7M
  - Energy Storage: 6 projects for \$30.6M
  - Direct Solar Fuels: 4 projects for \$11.0M
  - Vehicle Technologies: 5 projects for \$17.2M
  - Conventional Energy: 1 project for \$1.0M
  - Building Efficiency: 3 projects for \$14.5M
  - Carbon Capture: 5 projects for \$13.2M
  - Waste Heat Capture: 2 projects for \$4.7M
  - Direct Solar Fuels / Energy Storage: 1 project for \$4.1M
  - Biomass Energy / Direct Solar Fuels: 1 project for \$6.0M
  - Water: 1 project for \$2.0M

***First round project selections announced Oct. 26, 2009  
37 Transformational Energy R&D Projects - \$151M***

- Lack of “Valley of Death” funding
- On again, off again attitude to commercialization
- National Lab technologies difficult to find and access
- Lab processes and contracts slow and difficult to work with
- Lack of commercialization skills and market understanding in Labs and DOE
- Lab technologies are often incremental improvements than breakthroughs or platform technologies
- Lab Entrepreneurial Leave policy in effect but not used

## Connect Investors to Technologies

- Entrepreneur in Residence
- Technology Commercialization Showcase
- Portal
- Technology Summaries
- Business Plan Competitions

## “Valley of Death” Funding Gap

- Technology Commercialization Fund
- SBIR
- ARPA-E

## Education, Policy Advice and Market Pull

- Energy Efficiency Finance FACA
- Clean Energy Deployment Administration

## ARRA and Other Initiatives

- Advanced Vehicle Technology Manufacturing Program (136)
- Appliance Rebates (124)
- Renewables Manufacturing Tax Credit (48C)
- Loan Guarantee Program

## To meet the challenges of energy security and global climate change, we must:

- Rapidly deploy clean energy technologies at unprecedented speed and scale
- Conduct high-impact research and development and get those technologies from the labs to the market
- Attract the best and brightest into the fields of clean energy, science, engineering, and technology
- Focus the hearts and minds of consumers and businesses on clean energy choices

***“The United States has the opportunity to lead a new industrial revolution on clean energy”***

***- Secretary Steven Chu***