Office of Energy Efficiency and Renewable Energy

Fiscal Year 2014 Budget Rollout – Energy Saving Homes, Buildings, and Manufacturing

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

Dr. Kathleen Hogan, Deputy Assistant Secretary

May 1, 2013

EERE's National Mission

To create American leadership in the global transition to a clean energy economy

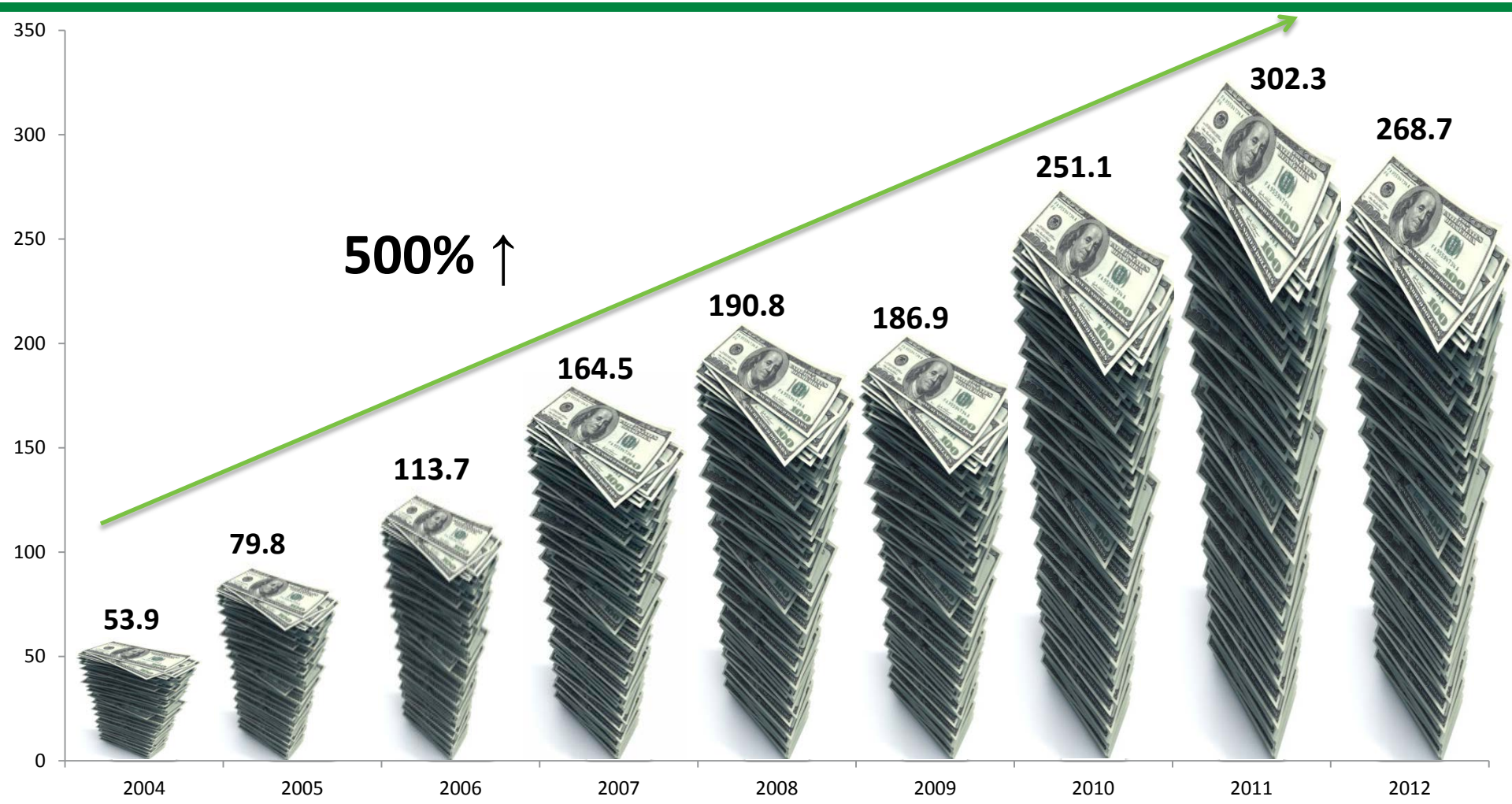
1) **High-Impact Research, Development, and Demonstration to Make Clean Energy as Affordable and Convenient as Traditional Forms of Energy**

2) **Breaking Down Barriers to Market Entry**

Why Clean Energy Matters To America

- Winning the most important **global economic development race** of the 21st century
- Creating **jobs** through American innovation
- Enhancing **energy security** by reducing our dependence on foreign oil and gas
- **Saving money** by cutting energy costs for American families and businesses
- **Protecting health and safety** by mitigating the impact of energy production on air quality and climate

Why Clean Energy Matters: Global Race



Global Clean Energy Investment, 2004-2012 (Billions of $)

Source: Bloomberg New Energy Finance, "*Global Trends in Clean Energy Investment" January 2013*

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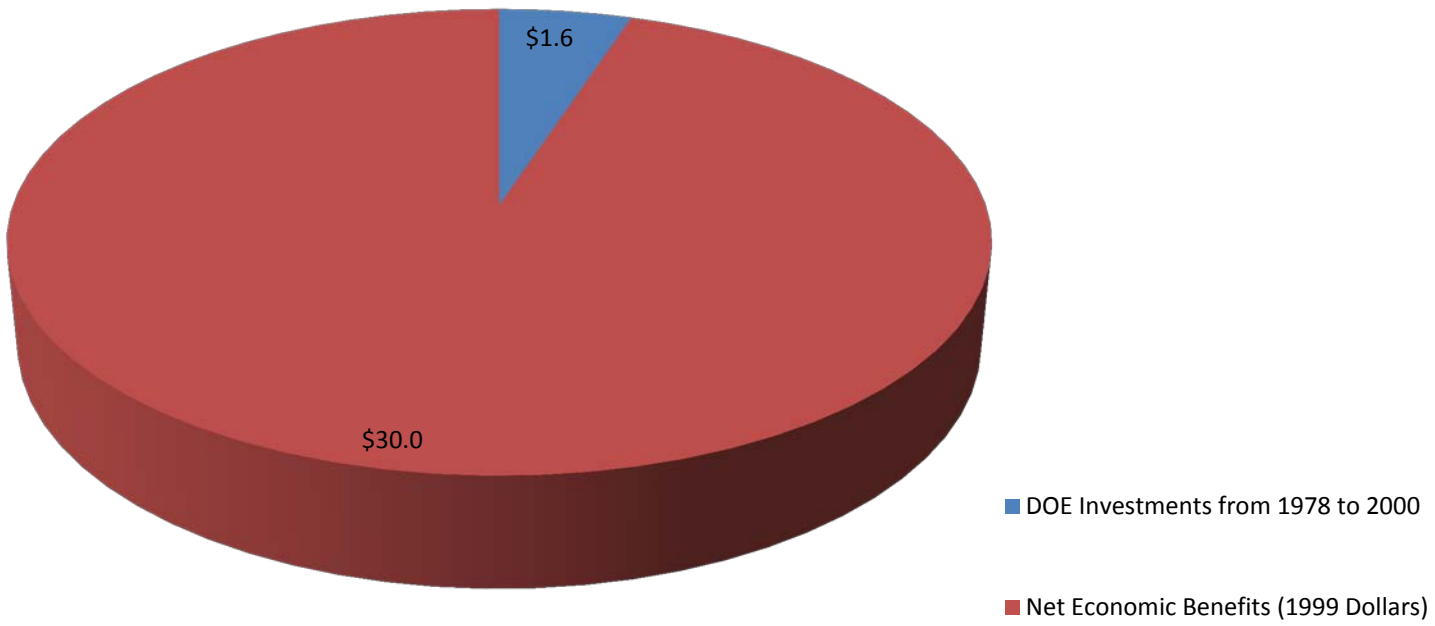
A Proven Track Record of Success

- Due to EERE appliance standards implemented through 2012, households can expect to save more than $350 per year by 2030, as they replace their existing appliances with newer models that use less energy – a cumulative savings to consumers of more than $900 million by 2020, and $1.7 trillion through 2030.
- Since 1979, EERE and its partners have successfully developed 220 new, energy-efficient manufacturing technologies, received 78 R&D 100 Awards, and delivered technical assistance to more than 33,000 industrial plants.
- Since 2005, EERE has facilitated $3.1 billion of efficiency investments in federal government facilities from performance-based contracts, which will result in energy cost savings of approximately $8.5 billion over the life of the energy-saving measures.
- Since 2009, the Weatherization Assistance Program has improve the energy performance and comfort in the homes of over 1,000,000 American families across the nation, which will save then nearly $7 billion in total energy costs.

Return on Investment: Energy Efficiency

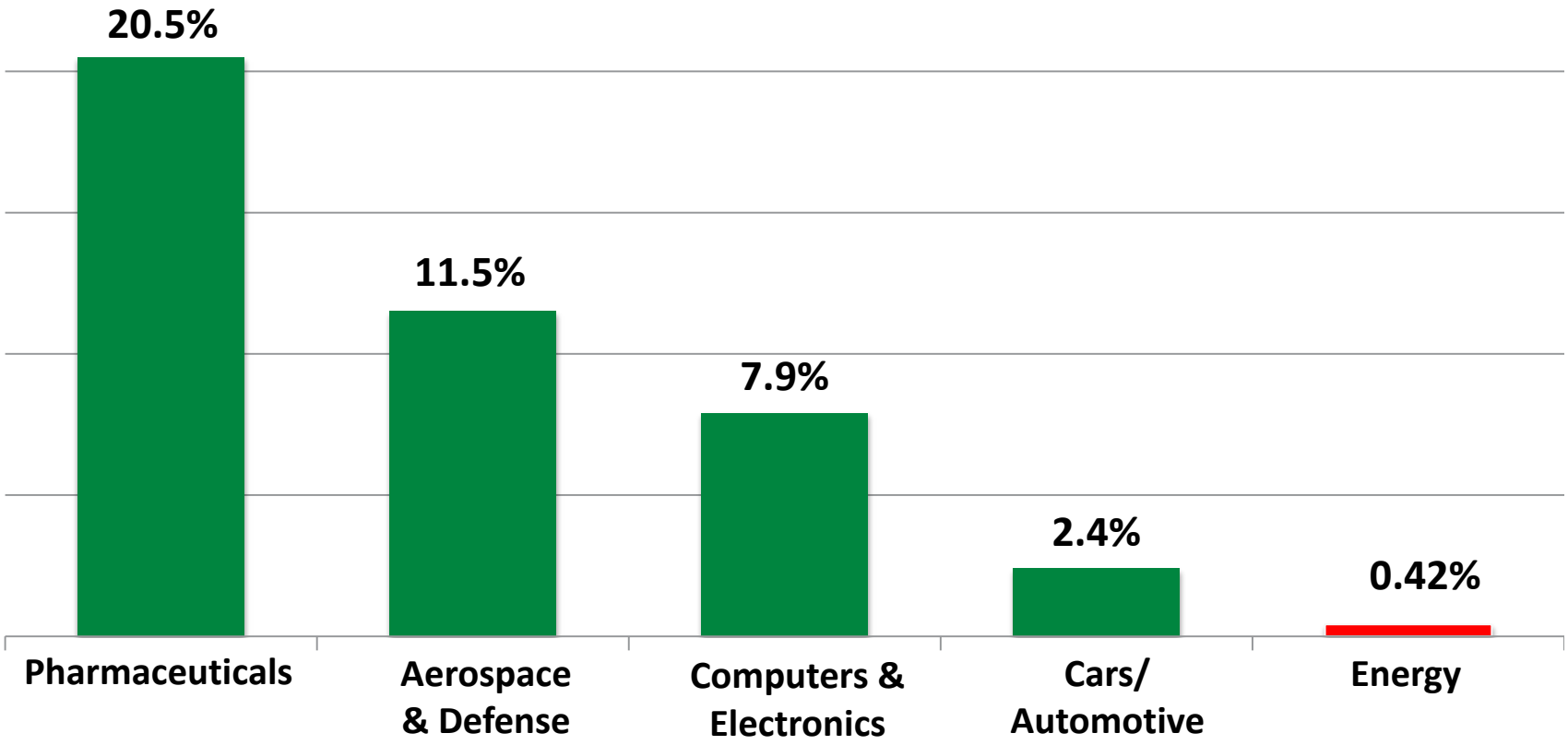
R&D Investments and Net Benefits (in Billions)



Investments of **$1.6 billion** in energy efficiency R&D from 1978 to 2000 realized a net economic benefit of approximately **$30 billion** (1999 dollars).

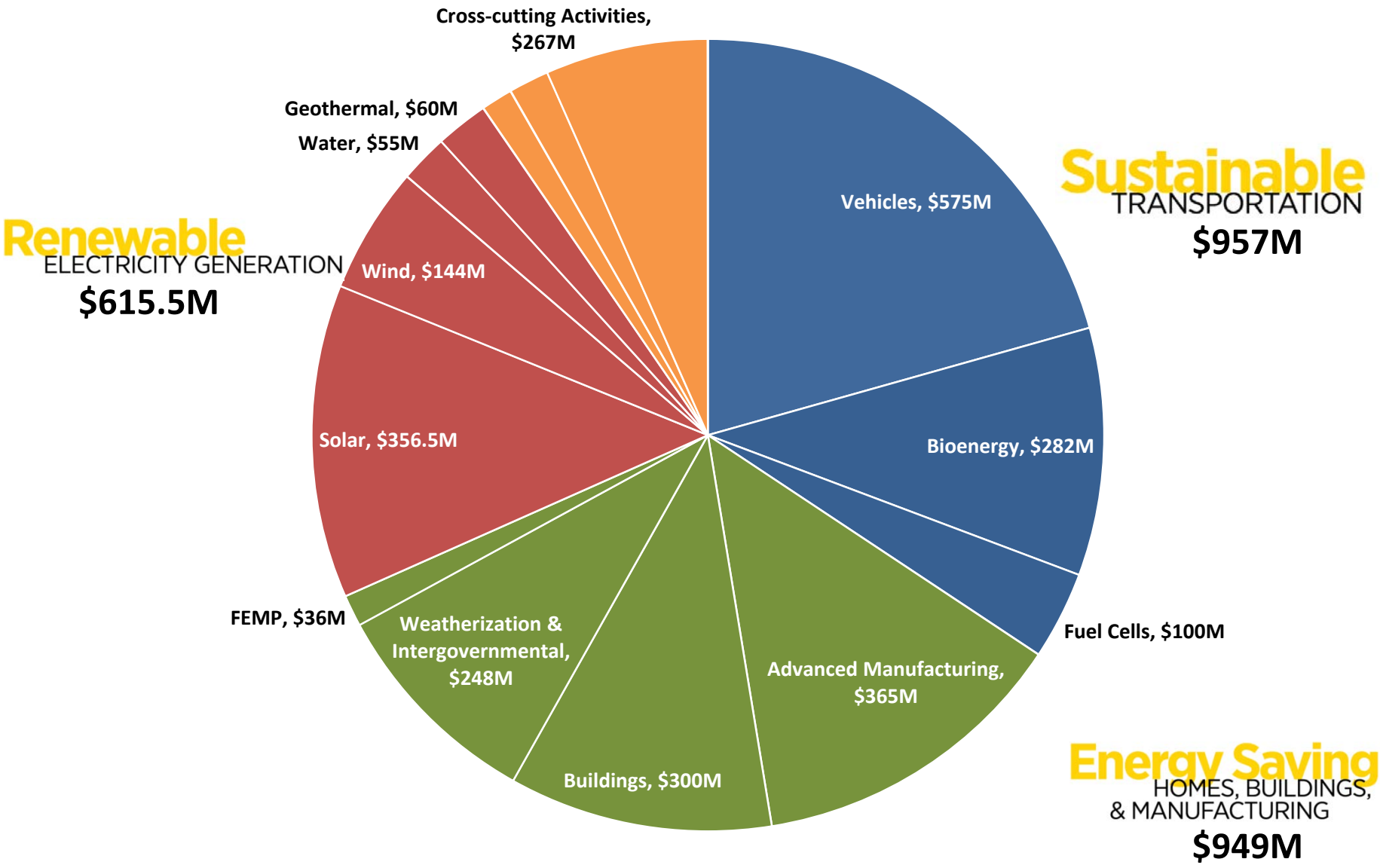
Source: National Research Council, "Energy Research at DOE: Was It Worth It? Energy Efficiency and Fossil Energy Research 1978 to 2000," 2001.

Why Federal Investment?
Low Private Investment in Energy R&D (as % of sales)



Source: American Energy Innovation Council, *Catalyzing American Ingenuity,* 2012

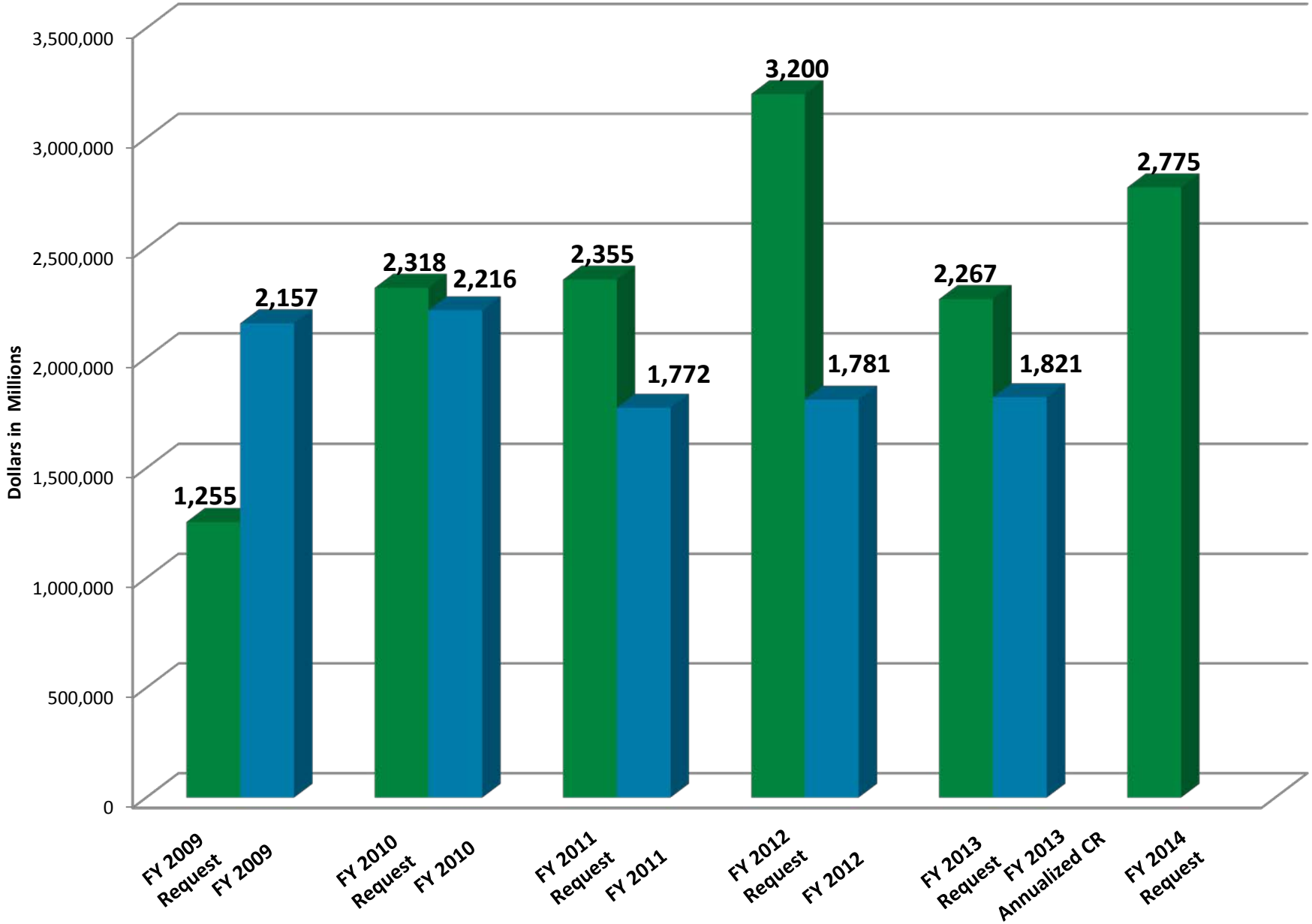
Fiscal Year 2014 EERE Budget Request - $2.78B



EERE Budget Summary

	FY 2012 Current	FY 2013 Request	FY 2013 Annualized CR	FY 2014 Request
Sustainable Transportation	**617,287**	**770,000**	**635,573**	**957,000**
Vehicle Technologies	320,966	420,000	330,819	575,000
Bioenergy Technologies	194,995	270,000	200,496	282,000
Hydrogen and Fuel Cell Technologies	101,326	80,000	104,258	100,000
Energy Efficiency	**485,289**	**872,000**	**495,690**	**949,000**
Advanced Manufacturing	112,692	290,000	116,287	365,000
Building Technologies	214,706	310,000	220,546	300,000
Federal Energy Management Program	29,891	32,000	30,074	36,000
Weatherization and Intergovernmental Activities	128,000	195,000	128,783	248,000
Renewable Electricity	**471,570**	**490,000**	**481,785**	**615,500**
Solar Energy	284,702	310,000	290,719	356,500
Wind Energy	91,813	95,000	93,825	144,000
Geothermal Technologies	36,979	65,000	38,094	60,000
Water Power	58,076	20,000	59,147	55,000
Corporate	**216,311**	**250,000**	**217,635**	**267,000**
Facilities and Infrastructure	26,311	26,400	26,472	46,000
Program Direction	165,000	164,700	166,010	185,000
Strategic Programs	25,000	58,900	25,153	36,000
Subtotal Energy Efficiency and Renewable Energy	**1,790,457**	**2,337,000**	**1,830,683**	**2,788,500**
Use of Prior Year Balances	**-9,909**	**-69,667**	**-9,970**	**-12,800**
Total Energy Efficiency and Renewable Energy	**1,780,548**	**2,267,333**	**1,820,713**	**2,775,700**

EERE Budget Trends: FY 2009[1] – FY 2014 Request

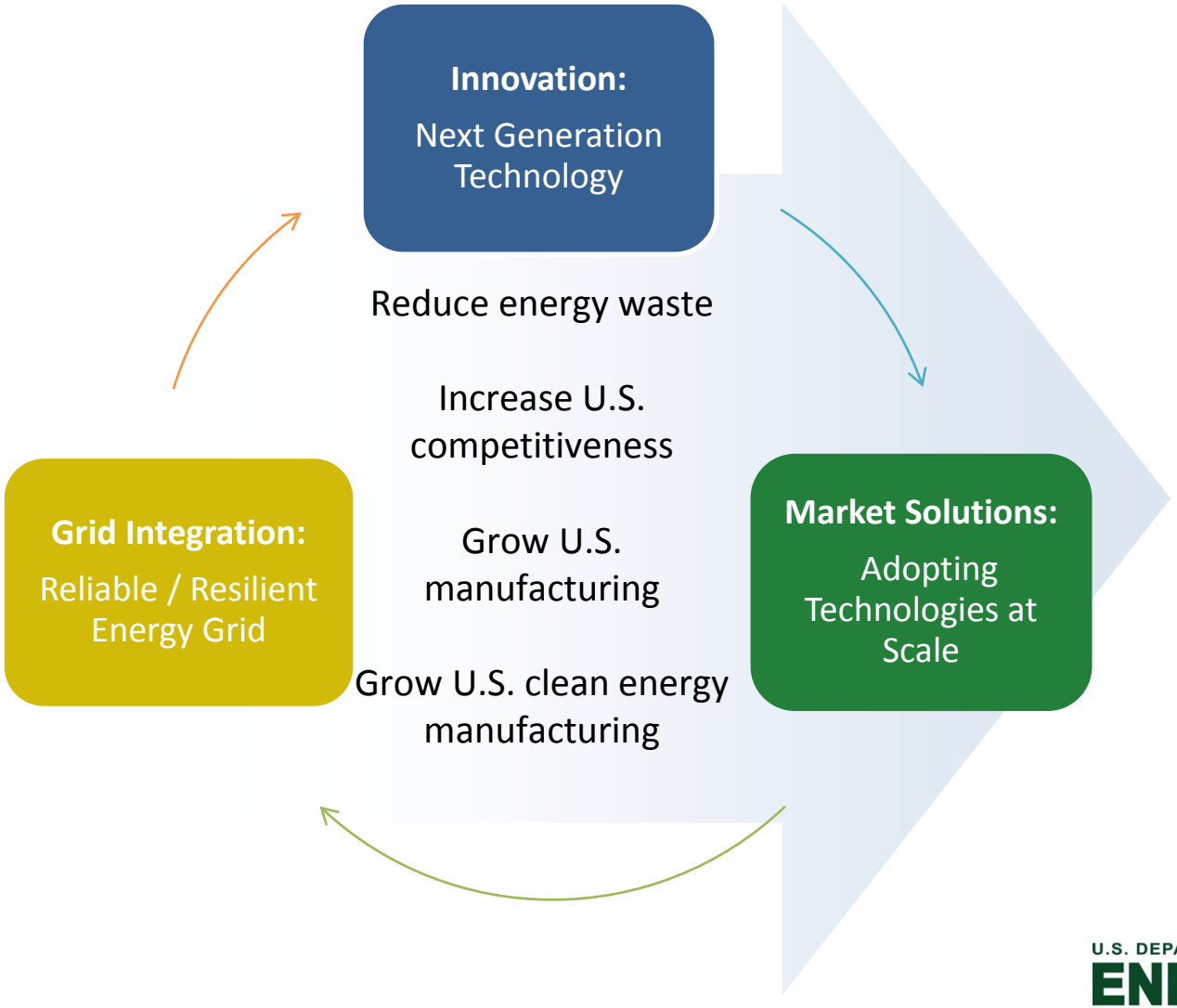


[1] Baseline funding does not include ARRA. In Current levels

Energy Saving

HOMES, BUILDINGS, & MANUFACTURING

Overview of Energy Savings Portfolio



Cut Waste by 50%

Double Energy Productivity

Energy Savings
Domestic Jobs
Economic development
Global competitiveness
New clean energy markets
Energy security / resiliency
Environmental protection

Cross-Sector Focus Areas

Innovation:

Next Generation Technology though High Impact Research

- Products, systems, and whole buildings
- Industrial processes
- Foundational technologies offering improvements across product lifecycles and multiple industries
- Clean energy manufacturing (energy efficient and renewable energy products)

Market Solutions:

Leveraged Efforts to Overcome Market Barriers and Take EE to Scale

- Making EE investment easier (transparent information, model approaches, quality workforce)
- Collaboration with State, Local, and Tribal governments
- Federal government Lead-By-Example
- Access to financing
- Minimum performance standards for buildings, appliances, and equipment

Grid Integration:

Integration of EE in an Efficient, Resilient, Modern Energy System

- Technologies and buildings to deliver cost-effective value to the grid and building owner/operator
- Distributed generation

Sector Strategies and Strategic Partnerships

Cut Home Energy Waste

- Next generation home technologies
- Next generation homes
- Catalyze home upgrades
- ENERGY STAR testing and test procedures
- Minimum appliance and equipment standards
- Building codes assistance

Cut Building Energy Waste

- Next generation building technologies
- Next generation buildings
- Catalyze building upgrades (Buildings Hub)
- ENERGY STAR testing and test procedures
- Minimum appliance and equipment standards
- Building codes assistance

Increase Industrial Competitiveness

- Advanced manufacturing processes
- Foundational technologies with full lifecycle and multi-industry benefits
- Combined heat and power
- Strategic energy management
- Minimum appliance and equipment standards

Clean Energy Manufacturing

- Cross-EERE collaboration
- Clean energy foundational technologies
- Critical materials

State, Local, Tribal Collaboration

- Lead-by-example
- Enabling policies and programs
- Financing mechanisms
- Low income weatherization

Federal Lead-by-Example

- Technical assistance to meet Federal requirements
- Performance contracting technical assistance
- Technology leadership
- DOE LBE

Advanced Manufacturing - Overview

Motivation/Focus

- Manufacturing converts a wide range of raw materials, components, and parts into finished goods that meet market expectations. By reducing the life-cycle energy consumption of manufactured goods by 50% over 10 years, we will support the creation of high-quality domestic manufacturing jobs and enhance the competitiveness of the United States. AMO's three focus areas include:
  - **Research and Development Projects** to bring the next generation manufacturing technologies and materials to full scale industrial use.
  - **Establish manufacturing Institutes** to engage in developing a rigorous set of industrial process technologies and materials that can be applied across a spectrum of globally competitive U.S. manufacturers and suppliers.
  - **Industrial Technical Assistance** to make it easier for American companies to manage energy wisely and make energy management an everyday part of doing business.

Achievements

- AMO is supporting 18 Next Generation R&D projects to bring foundational manufacturing technologies and materials to full-scale industrial capacity. These technologies will provide benefits across multiple sectors.
- Selected Critical Materials Hub – The Ames Laboratory led efforts is developing solutions across the lifecycle of critical materials.
- AMO established the Additive Manufacturing Demonstration Facility and Carbon Fiber Technology Facilities at ORNL.
- AMO demonstrated advanced CHP technologies with up to 85% percent efficiency, up to 330 kWe, while reducing emissions.
- 118 companies have committed to savings of 25% over ten years with cumulative energy savings of approximately 100 TBtus, and more than ten demonstrations of facilities were certified with new third-party system. 11 companies have committed to the Better Plants Challenge Program, which includes developing a showcase projects while offering transparency to their accomplishment.
- More than 220 technologies, 265 issued patents, and 78 R&D awards from 1999-2012 were commercialized.

Goals/Metrics

- Support the development of advanced manufacturing materials and processes that enable 50% energy savings across product lifecycles.
- Promote and assist the development of up to 40GW of new, cost-effective clean combined heat and power (CHP) by 2020.
- Engage leading industrial/manufacturing companies in reducing energy intensity by 25% over ten years.

Advanced Manufacturing – FY2014 Budget Request

(Dollars in Thousands)	FY 2012 Current	FY 2013 Annualized CR*	FY 2014 Request
Next Generation Manufacturing R&D Projects	60,334	—	120,000
Advanced Manufacturing R&D Facilities	34,628	—	217,500
Industrial Technical Assistance	17,730	—	27,500
Total, Advanced Manufacturing	**112,692**	**116,287**	**365,000**

*FY 2013 amounts shown reflect the P.L. 112 175 continuing resolution level annualized to a full year. These amounts are shown only at the "congressional control" level and above; below that level, a dash (—) is shown.

Advanced Manufacturing– FY2014 Budget Highlights

Fiscal Year 2014 Priorities:

- **Advanced Manufacturing R&D facilities ($217.5M)** Support the creation of Clean Energy Manufacturing Innovation Institutes ($192.5M) consistent with the President's vision for a larger multi-agency National Network for Manufacturing Innovation (NNMI). These are shared research facilities where industry and research institutions come together to develop and leverage cutting-edge cross-cutting advanced manufacturing capabilities to develop high-impact commercial manufacturing innovations. This funding also supports the Critical Materials Energy Innovation Hub ($25M) relative to FY 2012 level to develop solutions across the lifecycle of critical materials.

- **Next generation manufacturing R&D projects ($120M)**: Focuses on foundational cross-cutting manufacturing technologies (materials, processes, products) to dramatically increase U.S. manufacturing energy productivity at the bench and prototype scale. Foundational technologies include and benefit many industries, including energy intensive sectors. For example, advancements in membrane technologies affect the forest products, chemical, and petroleum industries and advancements in low-cost high strength structural metals benefits the metal casting and steel industries. The advancement made by each project applies to multiple energy-intensive industries and/or industries using the new materials/products, diversifying and multiplying the benefits of DOE investments.

- **Industrial Technical Assistance ($27.5M)** The funding for Industrial Technical Assistance will help enable the increased deployment of energy efficient manufacturing technologies, including combined heat and power (CHP), across American industry through training programs, site assessments, and standards development.

Clean Energy Manufacturing Innovation Institutes ($192.5M)

President Obama announced the National Network for Manufacturing Innovation (NNMI) in March 2012 to establish a network of up to 15 institutes of manufacturing excellence

National Network for Manufacturing Innovation (NNMI): Institutes in the network will be designed to bring together manufacturers and researchers to address technical challenges faced by industry and to develop high-impact commercial manufacturing innovations that enhance U.S. manufacturing competitiveness.

Clean Energy Manufacturing Innovation Institutes: DOE's Institutes will be consistent with the vision for NNMI and support EERE's Clean Energy Manufacturing Initiative which aims to dramatically improve U.S. competitiveness in the manufacturing of clean energy products and increase U.S. manufacturing competitiveness across the board by increasing energy productivity. The DOE Institutes will focus on **foundational technologies** that are broadly applicable and pervasive in multiple industries and markets with potentially transformational technical and manufacturing productivity impact.

Investment: $70 - $120 million per Institute (3 planned at this level) over 5-7 year award period, forward funded depending on the availability of funds.

Image source: manufacturing.gov

Buildings Technologies - Overview

Motivation/Focus

- EERE's Building Technologies Office develops and promotes efficient, environmentally friendly, and affordable technologies, systems, and practices for our nation's residential and commercial buildings.
- In the United States, residential homes and commercial buildings consume 40% of the Nation's total energy with an annual energy bill of more than $400 billion.
- This translates into more than 70% of the electrical energy consumed in the U.S.
- These energy bills can be cost-effectively reduced by 20-50% or more through various energy efficiency technologies and techniques.

Achievements

- Appliance standards: DOE standards improve the energy efficiency of household appliances, saving households money on their utility bills, as these households replace their existing appliances with newer models that use less energy. As a result of the standards implemented from 1987 through 2011, energy users were estimated to have saved approximately $40 billion dollars on their utility bills in 2010.
- Lighting: In 2012, BTO awarded the first L-Prize to Philips, who demonstrated a 60 W replacement bulb that uses only 9.7 W to produce 910 lumens (93.4 lm/W). In 2009, similar bulbs produced 55 lm/W and about one-half the light output.
- Commercial Building Integration: In 2012, a specification for a 10-ton capacity commercial air conditioner, or rooftop unit, was developed by BTO in collaboration with its industry partners in the Better Buildings Alliance. Units that meet the Challenge specification are expected to use 50% less energy than current units.
- HVAC: In 2012, a U.S. heat pump company, supported by BTO, developed first ground source integrated heat pump (GS-IHP) ever certified by the Air Conditioning, Heating, and Refrigeration Institute (AHRI). The heat pump is 60% more efficient than conventional systems.

Goals/Metrics

- The long-term, overarching goal of BTO is to reduce building-related energy use by 50% by 2030 against a 2010 AEO baseline. Metrics include:
  - Complete final rules for 13 products and Notice of Proposed Rulemaking for 17 products in FY 1014
  - Complete energy calculators, online tools, case studies, specifications and technology field installations, all products that demonstrate at least 20% energy savings over business as usual building usage with five year or less payback by 2014
  - Increase lighting efficacy of "warm white light" solid-state lighting in a lab device with a 15% reduction in manufacturing cost of a warm-white LED package (The goal in FY2008 was 101 lm/w and the end goal is to achieve 250 lm/w in 2015)
  - Retrofit 100,000 existing homes with at least 15% energy savings under Home Performance with Energy Star and the Better Building Network in 2014

Building Technologies – FY2014 Budget Request

(Dollars in Thousands)	FY 2012 Current	FY 2013 Annualized CR*	FY 2014 Request
Commercial Buildings Integration	31,913	–	36,570
Emerging Technologies	61,182	–	131,740
Energy Innovation Hub	23,583	–	24,300
Equipment and Buildings Standards	66,746	–	82,000
Residential Buildings Integration	31,282	–	24,390
NREL User Facility	0	–	1,000
Total, Building Technologies	**214,706**	**220,546**	**300,000**

*FY 2013 amounts shown reflect the P.L. 112 175 continuing resolution level annualized to a full year. These amounts are shown only at the "congressional control" level and above; below that level, a dash (—) is shown.

Building Technologies – FY2014 Budget Highlights

Fiscal Year 2014 Priorities:

- **Emerging Technologies R&D ($101.74M):** Fund high-impact R&D for emerging building efficiency technologies, including lighting, space conditioning/refrigeration, building envelope, sensors/controls, and other high-impact R&D areas. *(BTO sub-program: Emerging Technologies)*

- **Equipment and Buildings Standards ($82M):** With increased funds, BTO will add additional products to its Federal test procedure and standards program and explore the potential benefits of commercial product labeling, which can provide purchasers with information on expected product energy performance, expected energy expenditures, and other related information. *(BTO sub-program: Appliance Standards)*

- **Commercial Buildings ($10M):** Accelerate the adoption of advanced energy efficiency technologies and practices in small commercial buildings (under 50k ft^2) and new construction. Extend commercialization piloting to whole-building systems/solutions and technologies selected through an external competitive process. *(BTO sub-program: Commercial Buildings, Tech-to-Market)*

- **Grid Integration ($30M):** Conduct R&D to develop and further advance the platform of technologies, communications and controls necessary for customers to interact with a modernized and more flexible distribution system, specifically focusing on how buildings and building related systems and technologies can transact with each other and with the grid more efficiently and effectively. *(BTO sub-program: Emerging Technologies)*

- **Energy Performance Data ($10M):** Establish a more holistic, strategic approach to energy performance data, including common structures or taxonomy, data collection and analysis to inform private and public sector decision making, and analysis of energy efficiency projects, programs, and trends. *(BTO sub-programs: Commercial and Residential Building Integration)*

Energy Efficient Building Hub ($24.3M)

The **Energy Efficient Buildings Hub (EEB Hub)** was established as an Energy-Regional Innovation Cluster (E-RIC) on February 1, 2011. Federal funding for the EEB Hub's first five years of operation comes primarily from DOE, with additional contributions from the Economic Development Administration (EDA), the National Institute of Standards and Technology (NIST), and the Small Business Administration (SBA). The Commonwealth of Pennsylvania is providing separate funding for EEB Hub facilities, while EEB Hub participants also make cost-share contributions.

- The EEB Hub is headquartered at the Navy Yard in Philadelphia, providing an ideal test bed for research and demonstration of building energy efficiency.
- The EEB Hub vision is to design and demonstrate in Greater Philadelphia scalable market proven solutions to reduce energy use in commercial buildings and deploy these solutions throughout the nation. These solutions encompass novel whole building systems and deployment strategies to achieve Advanced Energy Retrofits (AERs) of average size commercial and multi-unit residential buildings that are both technically and financially sound.
- The over-arching goal of the EEB Hub is to reduce energy use in commercial buildings in Greater Philadelphia 20 percent by 2020 – this will demonstrate feasibility and potential impact of EEB Hub solutions for the nation.

Fiscal Year 2014 Select Activities:

- Proven suite of user-friendly simulation tools capable of predicting energy use in commercial buildings.
- Superior building operations platform that enables cost effective diagnostic and decision-making technologies.
- Proven advanced energy retrofit design and construction practices capable of achieving significant annual energy savings and executed by integrated teams of large and small enterprises throughout the region.

Federal Energy Management Program- Overview

Motivation/Focus

The Federal Energy Management Program (FEMP) works with Federal leaders to accomplish energy change within organizations by bringing expertise from all levels of project and policy implementation to enable Federal agencies to meet energy-related goals and to provide energy leadership to the country.

The Sustainability Performance Office (SPO) serves as the lead on all sustainability matters for DOE and implements the DOE Strategic Sustainability Performance Plan (SSPP). SPO provides critical support for managing, reporting, evaluating and achieving sustainability goals established by Executive Orders, statutes, and internal DOE policies.

Achievements

In FY 2011 the Federal Government:

- Reduced Scope 1 & 2 GHG emissions by 8.3% between FY 2008 and FY 2011
- Purchased or produced renewable energy in FY 2011 equivalent to 5.6% of total electricity use.
- Reduced water consumption intensity by 10.2% in FY 2011 relative to FY 2007.
- Reduced its energy intensity by 16.5% compared to FY 2003

As of March 2013, Federal agencies have committed to 310 potential projects with an estimated $2.3B in investment value.

- 61 projects have already been awarded with an investment value of $549 million
- 239 projects are in the development pipeline

Sustainability Performance Office:

- Performed technical assistance and conducted energy and water audits to support DOE sites in meeting EISA 432 requirements.
- In FY 2011, DOE reduced it's Scope 1 &2 (direct) GHG emissions by 37% relative to an FY 2008 baseline placing the Department on-track to meet the FY 2020 Scope 1 & 2 GHG reduction goal (28% reduction).

Goals/Metrics

- By December 2013, FEMP plans to implement $2 billion of new Federal government ESPC contracts from 2011-2012 baseline.
- Through the lifecycle of its planned activities, FEMP plans to achieve 57 trillion BTU through the Federal government through FY2014.
- Implement $2B of new Federal Government ESPC contracts from 2011-2012 baseline, by 2013
- Reduce energy intensity (Btu/square foot) by 18% in FY2011 compared to FY2003; 30% reduction required in FY2015
- Reduce water consumption intensity (gal/sf) by 8% relative to 2007 baseline; 16% by the end of FY2015; 26% by FY2020
- Use renewable electricity energy equivalent to at least 5% of total electricity use; at least half of which must come from sources developed after January 1, 1999. Must be at least 7.5% in FY2013 and thereafter
- Reduce government-wide GHG emissions by 28% for Scope 1&2 emissions and 13% for Scope 3 emissions by 2020 (from 2008 levels)

FEMP – FY2014 Budget Request

(Dollars in Thousands)	FY 2012 Current	FY 2013 Annualized CR*	FY 2014 Request
Project Financing	9,640	—	9,000
Technical Guidance and Assistance	9,640	—	9,000
Planning, Reporting, and Evaluation	4,832	—	3,491
Federal Fleet	1,793	—	2,000
DOE Specific Investments	3,986	—	2,509
Federal Energy Efficiency Funds	0	—	10,000
Total, FEMP	**29,891**	**30,074**	**36,000**

*FY 2013 amounts shown reflect the P.L. 112 175 continuing resolution level annualized to a full year. These amounts are shown only at the "congressional control" level and above; below that level, a dash (—) is shown.

FEMP – FY2014 Budget Highlights

Fiscal Year 2014 Priorities:

- **Federal Energy Efficiency Fund ($10M):** FEEF will provide direct funding to leverage cost-sharing at Federal agencies for capital improvement projects and other initiatives to increase energy efficiency and renewable energy investments at agency facilities. The program will dramatically increase the pipeline of these projects through direct financial incentives. In FY 2014, the program estimates that $10 million of FEEF funding will leverage $100 million of project investment and result in 13.6 trillion British thermal units (Btu) and $340 million in savings over the life of the projects.

Weatherization & Intergovernmental Program - Overview

Motivation/Focus

- The Weatherization and Intergovernmental Programs partners with state and local organizations to significantly accelerate the deployment of EERE's clean energy (e.g., energy efficiency and renewable energy) technologies and practices by a wide range of government, community, and business stakeholders.
- The program catalyzes the timely, material, and efficient transformation of the nation's energy system by assisting its extensive state, local and tribal networks to develop and implement energy policies and programs to meet critical energy needs and energy security priorities with cost-effective, commercially available clean energy technologies.
- Through a combination of financial and technical assistance the program provides across the value chain—from production to distribution to deployment—DOE achieves its strategic goal for greater deployment of innovative technologies throughout all segments of the economic development spectrum, including the private sector.

Achievements

- Provided funds and technical assistance to states to weatherize more than 1,000,000 homes.
- Established partnerships with 71 public sector partners to reduce their energy intensity by 20% or more by 2020.
- Provided funds and technical assistance to states that have supported retrofits of 28 million square feet of building space and installed more than 150 MW in renewable energy generation capacity.
- Created national certifications and work specifications for residential retrofit worker training, energy audits and weatherization methods.
- Provided funds and technical assistance to tribes that have supported retrofitting 64 tribal buildings with energy savings of approximately $900,000 per year.

Goals/Metrics

- Complete more than 24,000 residential retrofits for low income families in FY 2014.
- Achieve 4.0 trillion Btu of first year energy savings from State Energy Program projects.

Weatherization & Intergovernmental Program – FY2014 Budget Request

(Dollars in Thousands)	FY 2012 Current	FY 2013 Annualized CR	FY 2014 Request
Weatherization Assistance Program			
Weatherization Grants	65,000	65,398	181,000
Training and Technical Assistance	3,000	3,018	3,000
Total, Weatherization Assistance Program	**68,000**	**68,416**	**184,000**
State Energy Program	50,000	50,306	57,000
Tribal Energy Program	10,000	10,061	7,000
Total, Weatherization and Intergovernmental	**128,000**	**128,783**	**248,000**

Weatherization & Intergovernmental Program – FY2014 Budget Highlights

Fiscal Year 2014 Priorities:

The program's FY 2014 budget restores funding to weatherization grantees at the level necessary to retain basic program operations.

- **Weatherization Assistance Program ($184M):** Achieve larger energy cost savings for more low-income households and develop new approach for financing multi-family housing retrofits. Actively manage 59 weatherization formula grantees

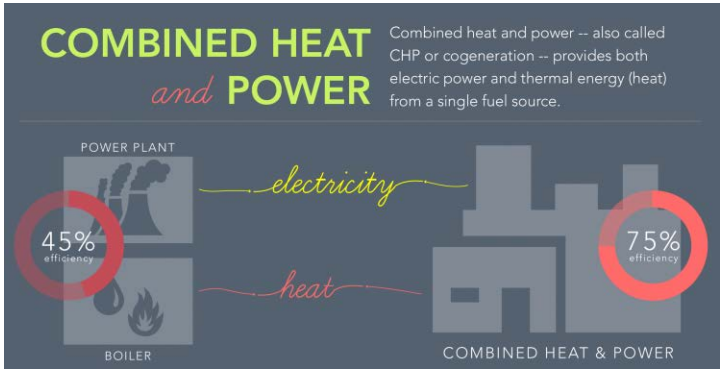
- **State Energy Program ($57M):** Maintain the viability and capacity of the State Energy Office network through formula grants and support 20-25 competitively selected projects to expand clean energy development through benchmarking, technical assistance, etc. Assist states and local governments with the design and implementation of sustainable energy programs in coordination with the Better Buildings Challenge and Better Buildings Alliance

- **Tribal Energy Activities ($7M):** Utilize competitive financial support (15-30 grants) and technical assistance to stimulate clean energy project planning and implementation on tribal lands. Develop implementation plan with DOE Office of Indian Energy Policy and Programs on technical assistance and financial support

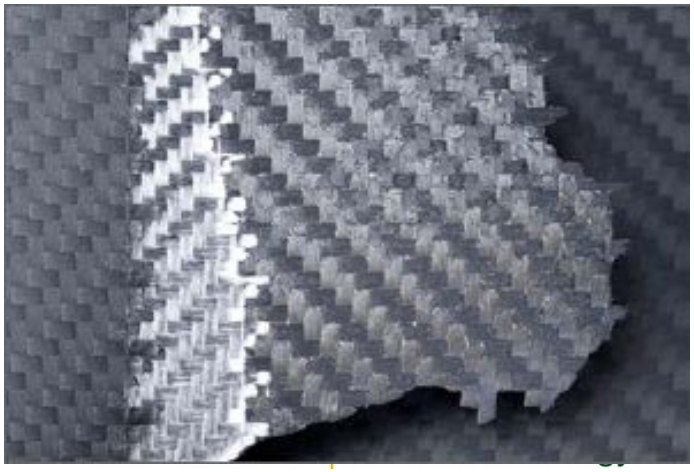
Cross-Cutting EERE Initiatives

Clean Energy Manufacturing Initiative

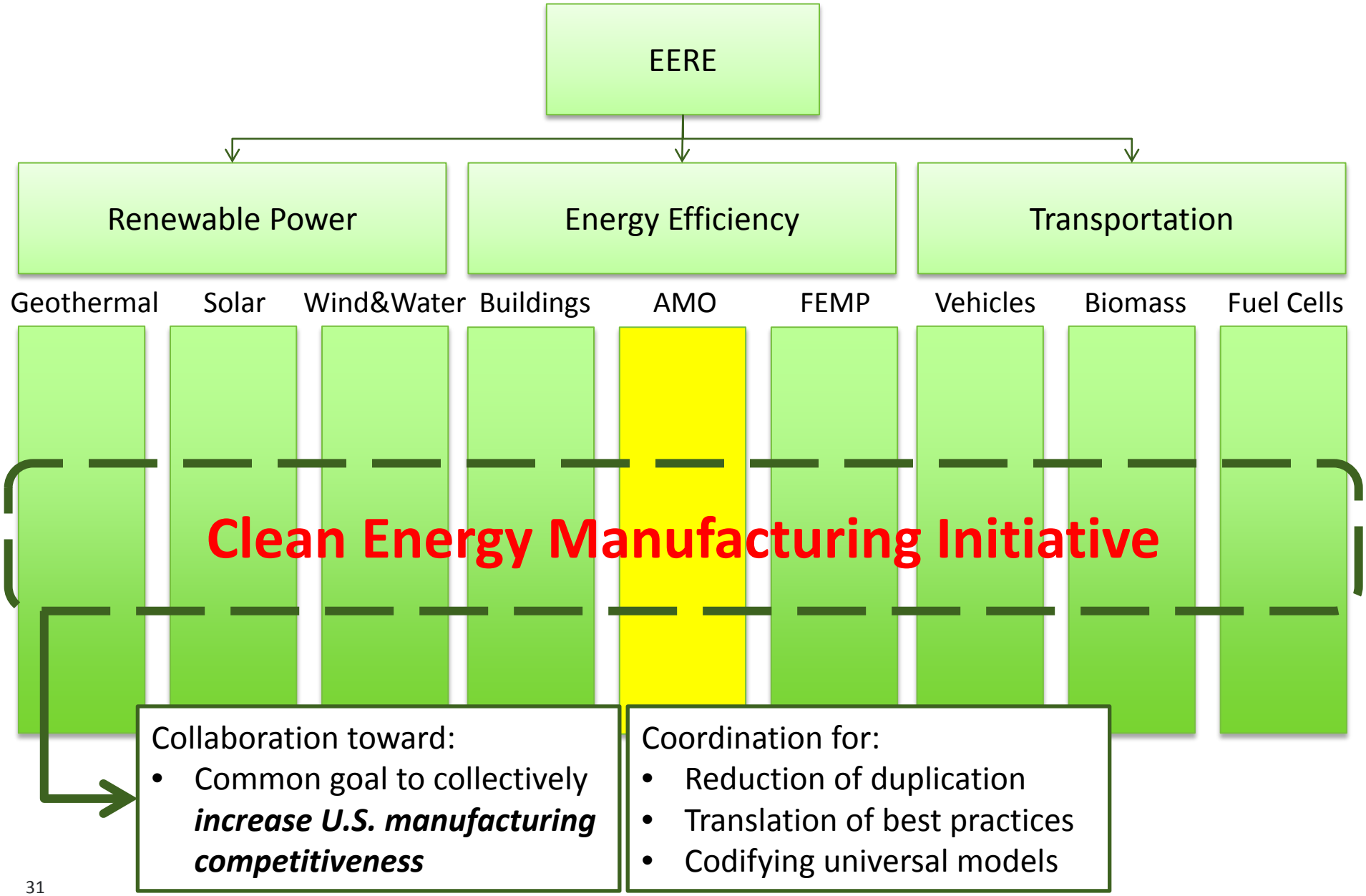
1. **Increase U.S. manufacturing competitiveness across the board by increasing energy productivity**
   - *Enhancing competitiveness of U.S. companies*



2. **Increase U.S. competiveness in the production of clean energy products**
   - *Invest in competitive advantages, overcome competitive disadvantages*



Internal Coordination on Clean Energy Manufacturing



EERE Incubators: High-Impact "Off-Roadmap" Technologies ($110M)

EERE Incubators:

- Pilot expansion of successful "Sunshot Incubator Program" in Solar Energy Technology Office to other EERE technology offices
- Enables ongoing on-ramp for "off-road-map" emerging technology approaches
- Small fraction of annual R&D budget
- SunShot Incubator program has leveraged $90M in competitively awarded government funds into more than $1.7B in private-sector follow-on funding

Program Offices	(Dollars in Thousands)
Vehicle Technologies	30,000
Bioenergy Technologies	20,000
Hydrogen and Fuel Cell Technologies	7,500
Wind Energy	4,500
Water Power	1,650
Advanced Manufacturing	20,000
Solar Energy	21,400
Building Technologies	5,000
Total Incubator Investments	**$110,000**

EERE Grid Integration Initiative: Goal & Vision ($80M)

Cross-cutting EERE Program to Address Grid Integration Barriers to High Penetration of EERE Technologies

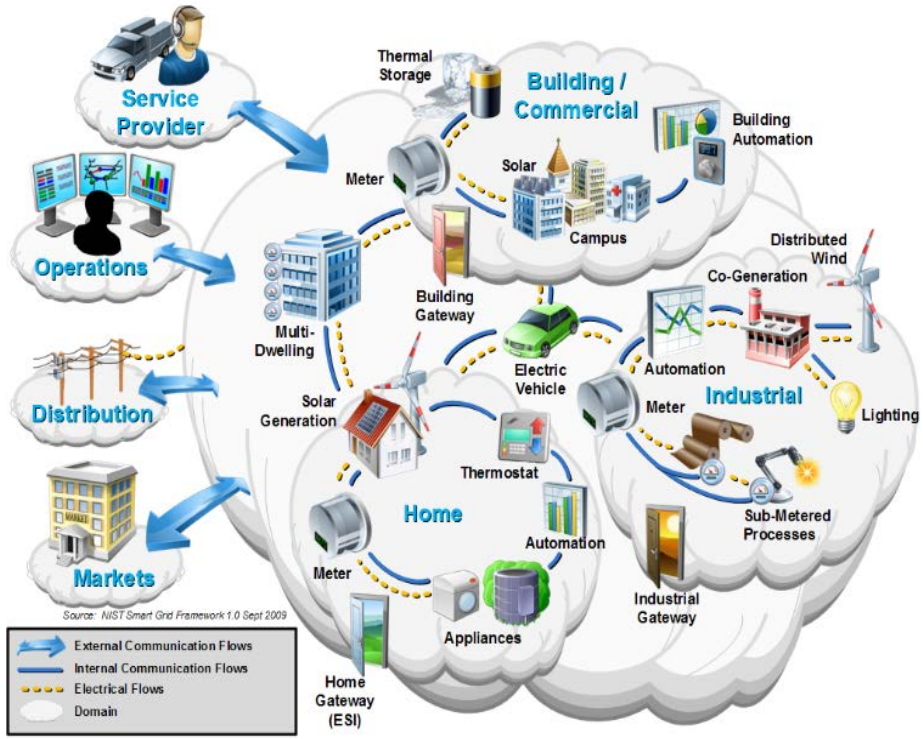
Importance of Integrating Clean Energy Technologies Into the Electricity Grid

Cost reduction alone will not enable large-scale deployment. As clean energy and energy efficient technologies become more prevalent on the customer side of the meter, the distribution system must evolve to accommodate these technologies. Distributed variable resources (e.g., solar, etc.), electric vehicles, and building energy technologies must be holistically integrated to be adopted by utilities or the marketplace at a scale necessary to achieve significant energy, economic, and environmental benefits.

Multi-Program (Solar, Buildings, and Vehicles) Initiative

Address grid integration barriers through joint funding opportunity announcements aimed at load serving utilities and supported by integrated national laboratory effort.

- Protection and restoration
- Systems optimization
- Data management and communications
- Interoperability and standards
- Sensors and data
- Distribution models and tools
- Owner economics



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

For Further Information

Office of Energy Efficiency & Renewable Energy - http://www.eere.energy.gov/

Fiscal Year 2014 EERE Budget Request Information:
http://www1.eere.energy.gov/office_eere/bo_budget_fy14.html

State Summaries: A Snapshot of EERE's Work in States
http://apps1.eere.energy.gov/states/state_summaries.cfm

Cross-cutting EERE Initiatives

SunShot: http://www1.eere.energy.gov/solar/sunshot/

EV Everywhere: http://www1.eere.energy.gov/vehiclesandfuels/electric_vehicles/index.html

Clean Energy Manufacturing Initiative: http://www1.eere.energy.gov/energymanufacturing/index.html

Energy Efficiency – FY 2014 Technology Office Budget Requests

Advanced Manufacturing:
http://www1.eere.energy.gov/office_eere/pdfs/budget/manufacturing_ataglance_2014.pdf

Building Technologies:
http://www1.eere.energy.gov/office_eere/pdfs/budget/buildings_ataglance_2014.pdf

Federal Energy Management Program:
http://www1.eere.energy.gov/office_eere/pdfs/budget/femp_ataglance_2014.pdf

Sustainability Performance Office:
http://www1.eere.energy.gov/office_eere/pdfs/budget/spo_ataglance_2014.pdf

Weatherization and Intergovernmental:
http://www1.eere.energy.gov/office_eere/pdfs/budget/wip_ataglance_2014.pdf

For more information, please contact EERE Stakeholder Engagement at SE@ee.doe.gov