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TO SAVE ENERGY

*Using less. Doing more.*

# EE 101: Building Blocks of Energy Efficiency Policy

Capitol Hill Briefing

February 19, 2015



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# America's Greatest Energy Resource: Using Energy Efficiency to Fuel U.S. Productivity

**Kateri Callahan, President**

**Alliance to Save Energy**

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# Presentation Overview

- A Few Words About the Alliance
- A Look Back: How Energy Efficiency Became America's Greatest Energy Resource
- A Look Forward: Doubling U.S. Energy Productivity by 2030
- The Keys to Success: Public Policy Tools and Programs
- Deep Dive:
  - Buildings
  - Consumers
  - Federal Government (Largest Single U.S. Energy Consumer)

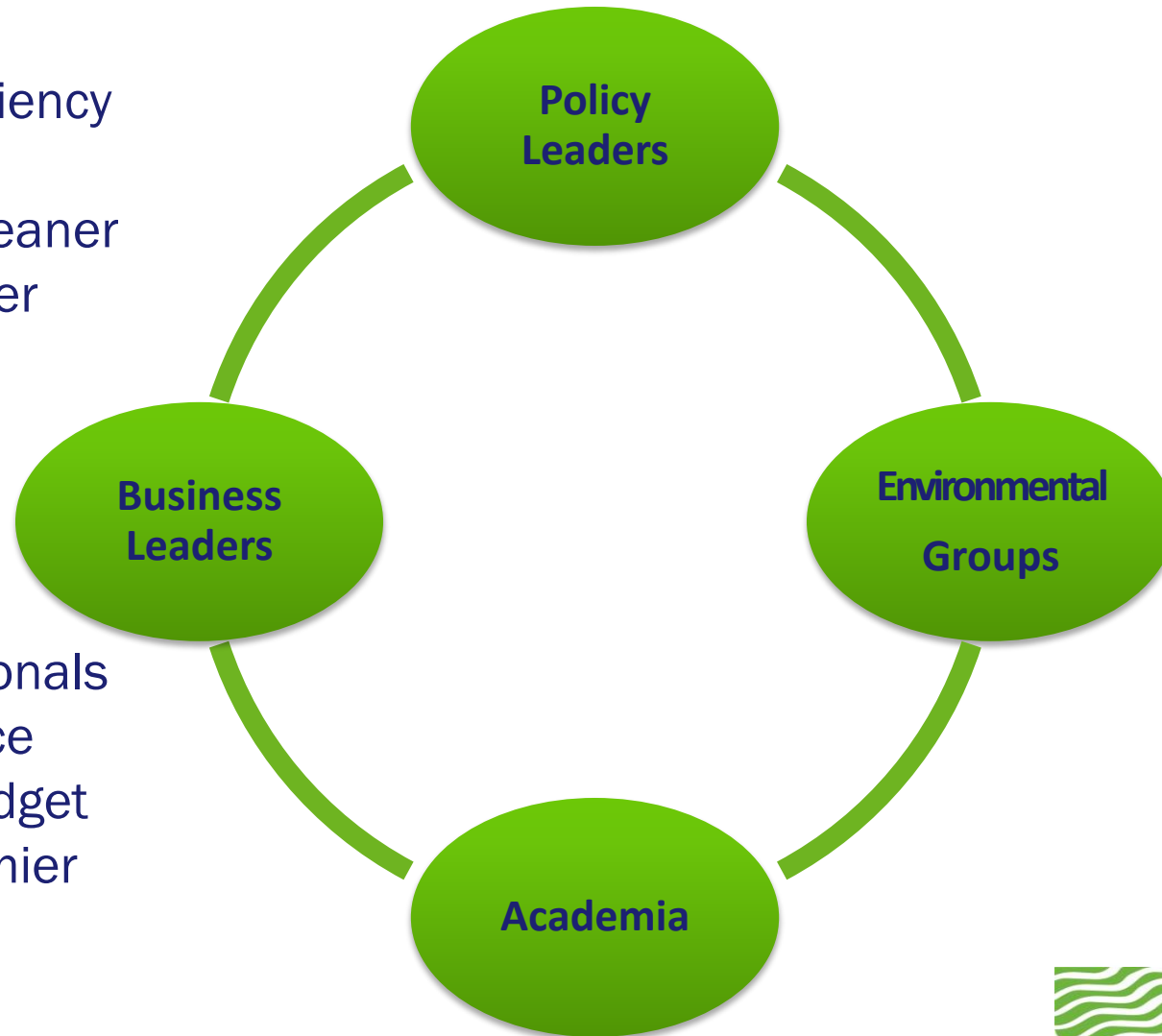
# What is the Alliance to Save Energy?

## Mission:

To promote energy efficiency worldwide to achieve a healthier economy, a cleaner environment, and greater energy security.

## Organization:

- Staff of 40+ professionals
- 38 years of experience
- \$8 million annual budget
- Recognized as a premier energy efficiency organization



# What is the Alliance to Save Energy?

Nonprofit organization headquartered in U.S.; international reach

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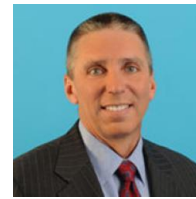
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Washington Gas



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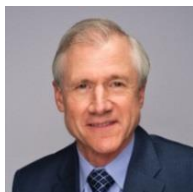
**Greg Merritt**  
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**Jane Palmieri**  
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**Robert Pratt**  
GreenerU



**Gil Quiniones**  
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**Kevin Self**  
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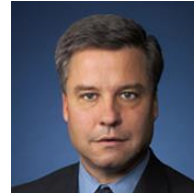
**J. Heath Shuler**  
Duke Energy



**Bill Sisson**  
United Technologies



**Cathy Snyder**  
Lockheed Martin



**Fred Stephan**  
Johns Manville



**Dave Szczupak**  
Whirlpool



**Susan Tierney**  
Analysis Group



**Clint Vince**  
Dentons LLP

# Working with and Across All Sectors of the Economy

Business ▪ Government ▪ Public Interest



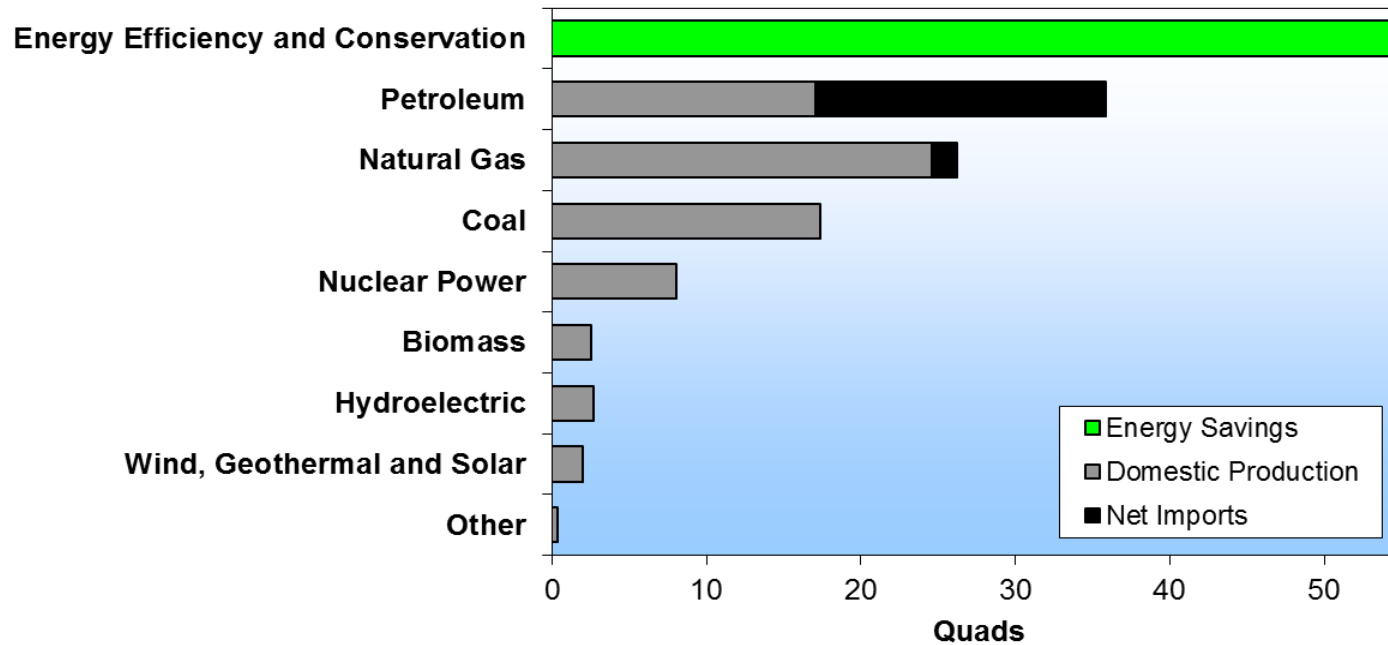
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# At the Crossroads: A Quiet History of Huge Success!

## Energy Efficiency: America's Greatest Energy Resource

U.S. Energy Resources Used in 2012



Alliance to Save Energy, 2014



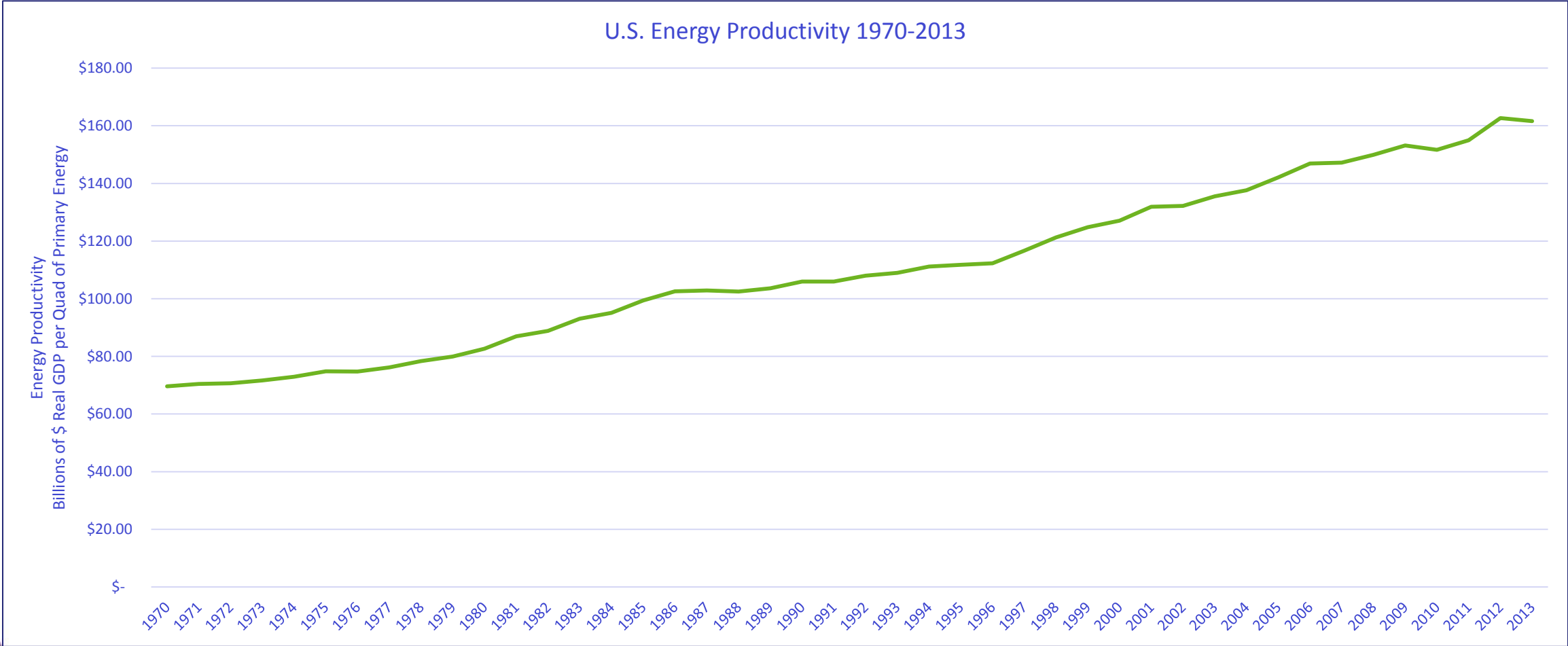
# Putting the Gains into “Dollars and Sense”

Energy Efficiency is AVOIDING roughly **2.5 billion tons** of CO2 annually



Energy Efficiency is *saving the U.S. economy* **\$400 billion** in avoided energy costs EACH YEAR!

# Energy Productivity Growth

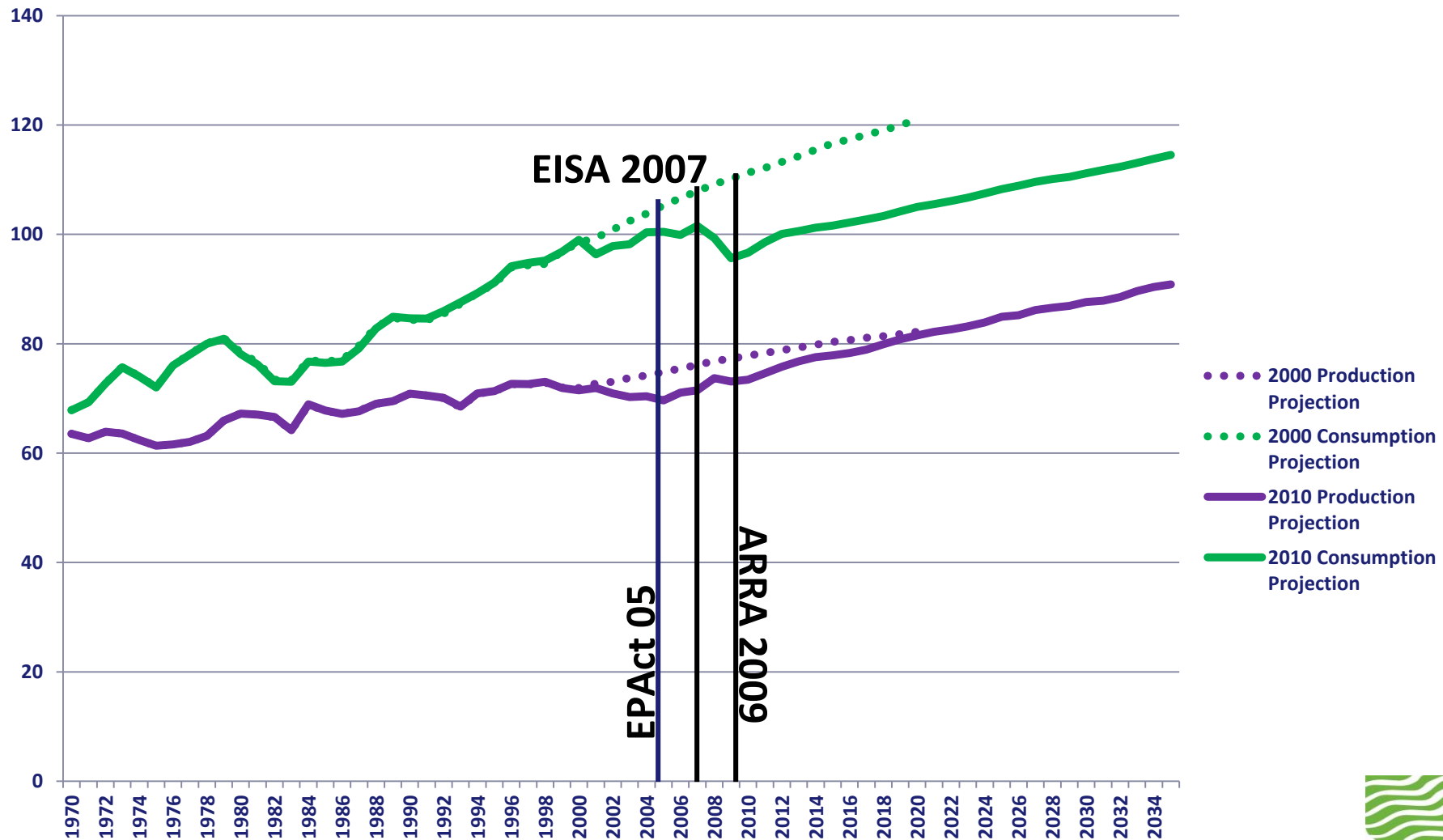


Energy Productivity in the U.S. has increased by 132% since 1970

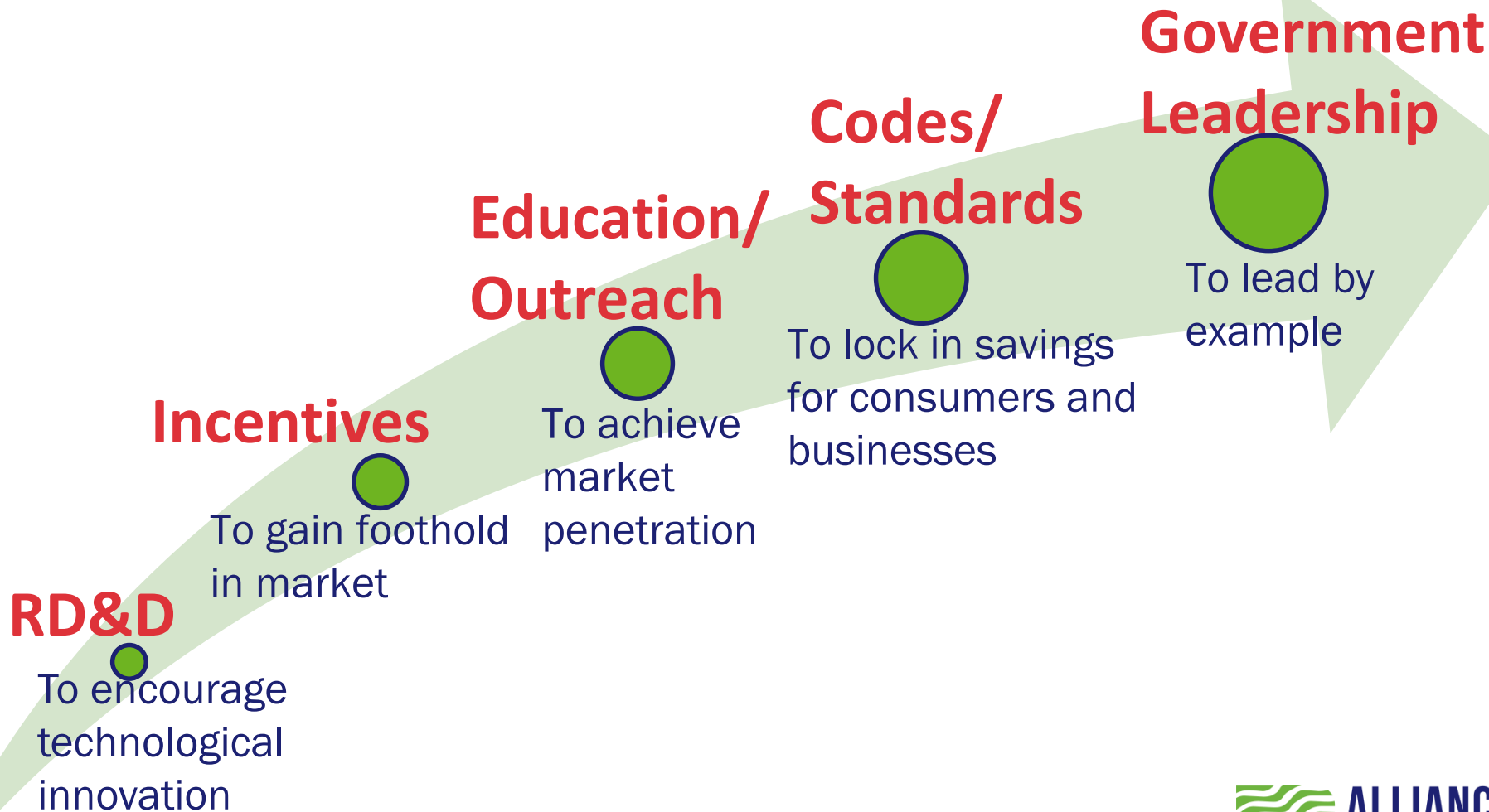


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# Seizing the Day: Public Policy Matters



# Public Policy: A Cornerstone of the Past Success



# Setting an Agenda for the Future: Energy 2030

## The Goal:

- Double U.S. energy productivity (2x GDP from every unit of energy) by 2030

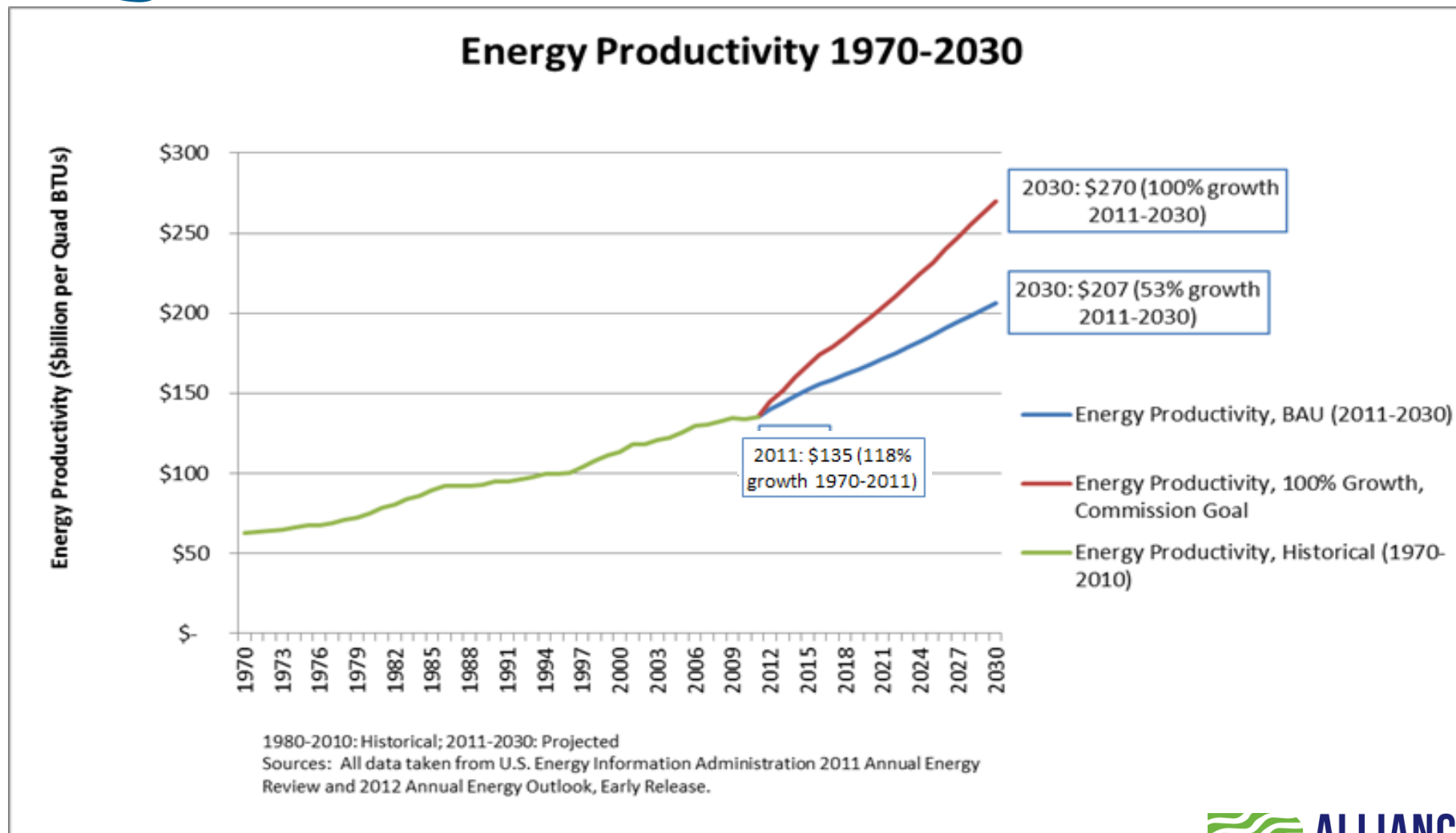
## The Framework: A Policy Prescription

- Non-Partisan
- Address all sectors of the economy
- Engage all levels of government + private sector
  - ½ of 54 recommendations for feds; ½ for state, local & private sector
- Bold but also *actionable*
- Respect appropriate roles of government(s)
- Engage and excite public opinion leaders



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# Setting an Audacious but Doable Goal



# Impact

America could save

**\$327 BILLION**  
IN 2030

**\$95 BILLION** in Buildings



**\$139 BILLION** in Transportation



**\$94 BILLION** in Industry



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# Impact of Reaching the Goal

## TO OUR COUNTRY THIS MEANS



### A CLEANER ENVIRONMENT

Decrease U.S. CO<sub>2</sub> emissions to 4 billion metric tons - 33% less than 2005



### GREATER SECURITY

Reduce energy imports by over \$100 billion



### STRONGER ECONOMY

The U.S. could add 1.3 million jobs and boost GDP by up to 2%



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# The Roadmap to Achieve the Goal

## Three Key Strategies

INVEST



MODERNIZE



EDUCATE



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INVEST



# Recommendations

- Make **financing** more easily available for energy efficiency projects
- Advance energy productivity through federal **tax reform**
- Support energy productivity **innovation** and market adoption
- Governments **lead by example**



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MODERNIZE



# Recommendations

- Use energy productivity to achieve **regulatory and planning goals**
  - Utility policy
  - Transportation and land-use planning
  - Environmental regulations
  - Infrastructure investments
- Strengthen building, equipment, and vehicle efficiency **standards**



EDUCATE



# Recommendations

- Provide **information** on building energy efficiency and energy use
  - Ratings, benchmarks, labels and disclosure
- Improve corporate **energy management** and transparency
- Develop **educated** consumers and **trained** technicians



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# New/Anticipated Legislative Developments

- **House:** Upton Energy Framework
  - Infrastructure, Workforce Development, Energy Diplomacy, and Efficiency And Accountability
- **Senate:**
  - Murkowski Energy Plan
  - “New” Portman-Shaheen Bill

# Policy & Program Highlights

Since 2009 improved building energy codes have saved U.S. homes and businesses \$44 billion on energy bills

\$4 billion commitment to fund upgrades to Federal buildings thru ESPCs

ESPCs found to deliver 174 – 197% greater savings than guaranteed

Appliance & Equipment standards that will save Americans \$450 billion on utility bills through 2030

CAFE Standards to 54.5 mpg will save \$1.7 Trillion by 2025

7 million homes weatherized saving families up to \$400/yr.

# Accelerate Energy Productivity 2030

New Partnership with the U.S. Department of Energy & the Council on Competitiveness

- Three primary objectives:
  - Build awareness and understanding of 2x EP Goal
  - Secure endorsements of the goal and ***action commitments*** ;
  - Create a “roadmap” for achieving goal
- Tactics:
  - “C-Suite” Dialogues Around the Country to Develop “Roadmap” and Secure Commitments
  - Regional Gatherings to Engage Local & State Officials, Businesses, and Stakeholders
  - Interactive Website to Create “Community” of Action and Best Practices
  - National Gathering to Unveil “Roadmap” & Unite Participants

# Endorsers - 117 to date!







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# Allen Staymen

Senior Professional Staff Member

Senate Committee on Energy and Natural Resources

# EE 101: ENERGY CODES

February 2015

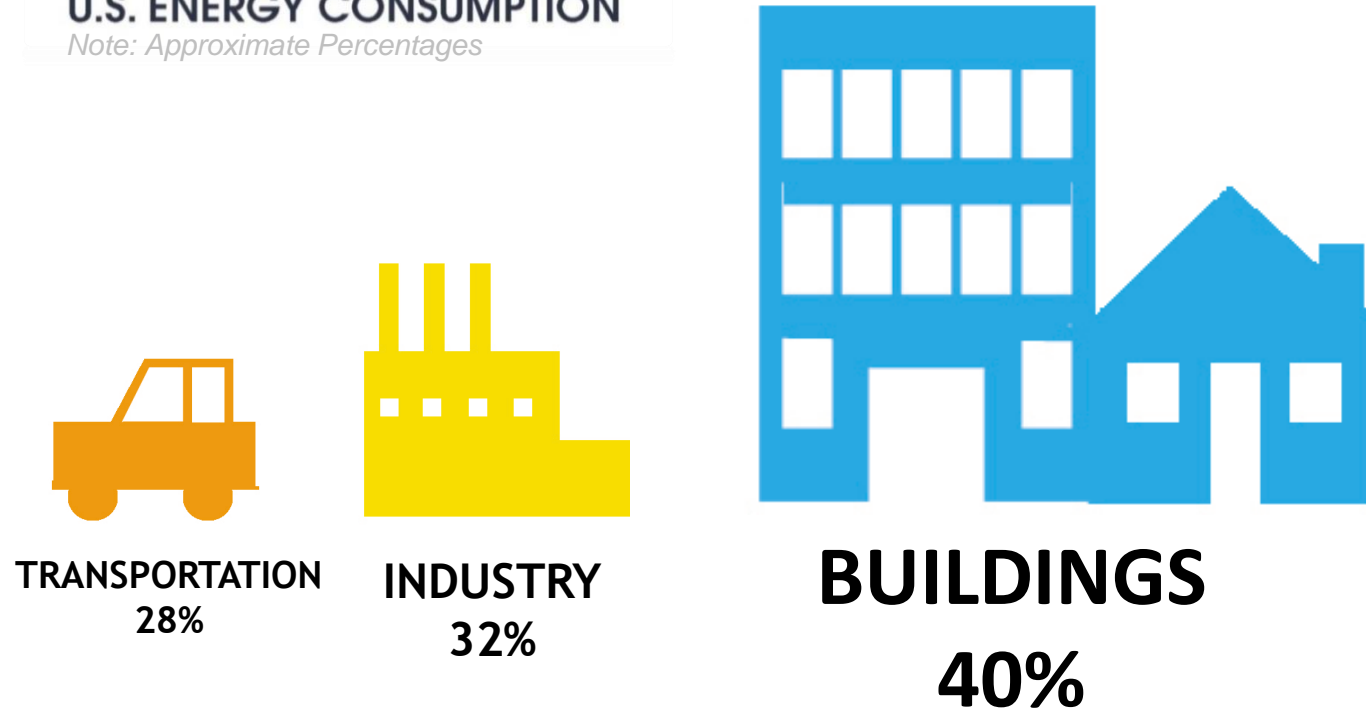
Maureen Guttman, AIA

President, Building Codes Assistance Project

# Why are BUILDINGS Important?

## U.S. ENERGY CONSUMPTION

*Note: Approximate Percentages*



**40-70-40**

- 40% of U.S. energy is consumed by the building sector
- 70% of U.S. electricity demand from buildings
- 40% of CO<sub>2</sub> emissions attributable to buildings

# Why are codes important?

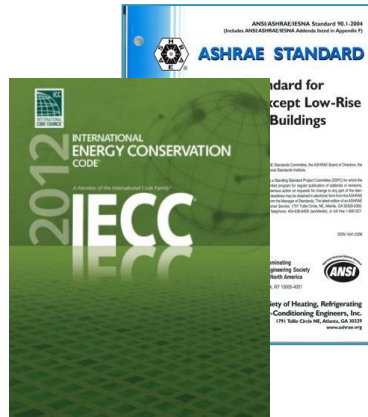


# What are building codes?



- ▶ Updated every 3 years to accommodate new technologies and new hazards
- ▶ Developed by consensus, by experts
- ▶ Incorporate hundreds of standards

# What are energy codes?



Energy codes are the minimum standards for energy efficiency in new and renovated residential and commercial buildings.

- ▶ Baseline energy performance of a building
- ▶ Part of overall building codes adopted by state and local governments
- ▶ Energy codes establish a foundation for energy and green programs: *ENERGY STAR*, *LEED*, *ASHRAE Standard 189*, *Building America/federal tax incentive*, and *Net-zero energy buildings*.

# Energy codes as continuing public policy issue

- ▶ Adopted as law by state or local jurisdictions
- ▶ Enforcement is typically carried out by governments at the local level
- ▶ Levels of full compliance are unknown



# Federal obligations and goals

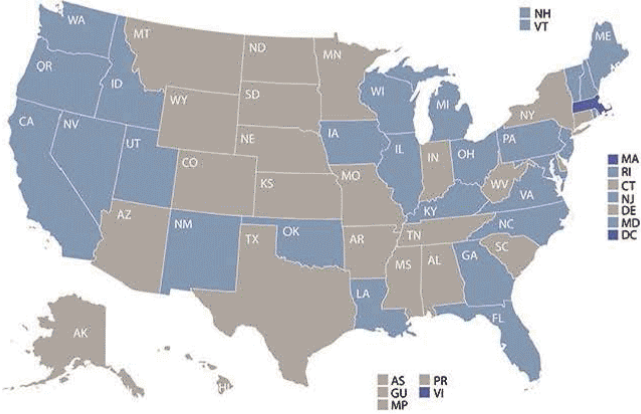
- ▶ Energy Policy Act of 1992
  - ▶ States must adopt equivalent of ASHRAE Standard 90.1
  - ▶ States must adopt International Energy Conservation Code (IECC) - or submit justification for not adopting
- ▶ American Recovery & Reinvestment Act
  - ▶ Appropriated \$3.1 billion to DOE's State Energy Program (SEP) that assisted states with building energy efficiency efforts.
  - ▶ 2009 IECC and 90.1-2007
  - ▶ 90% compliance by 2017



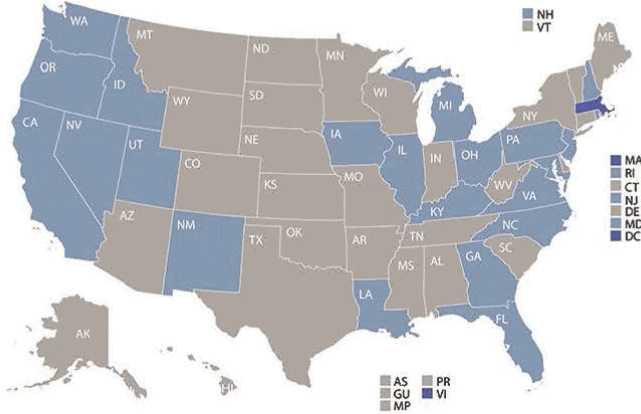


# Federal programs matter!

January  
2009



Commercial State  
Energy Code Status



Residential State  
Energy Code Status

# Why are codes important?

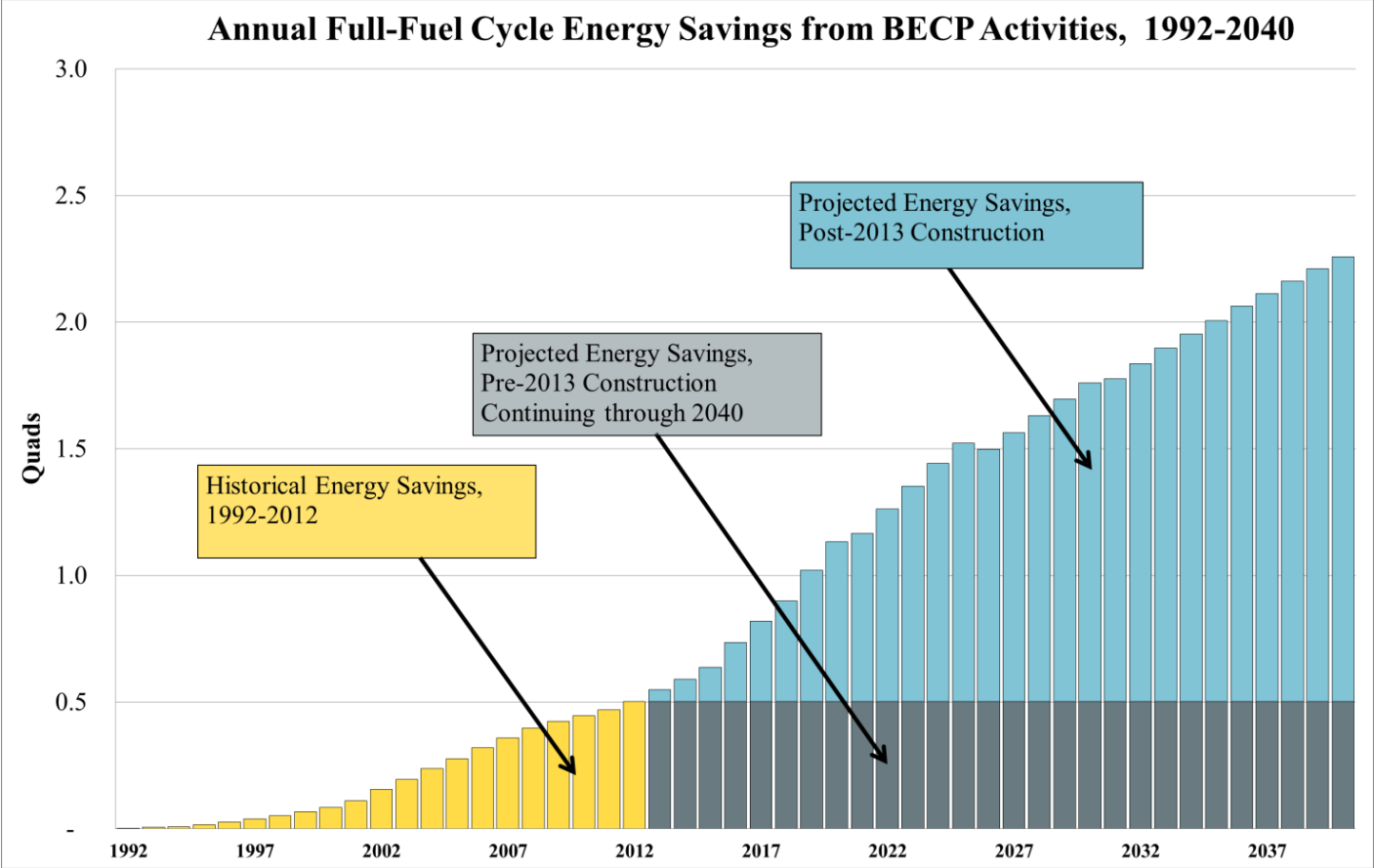


1. Reduces stress on power grid and natural gas supplies
2. Market certainty for manufacturers, investors, consumers
3. The implementation infrastructure already exists
4. Stimulates the economy and creates green jobs

# Why are codes important?



# Energy codes save.



# Thank you!

Maureen Guttman, AIA  
Building Codes Assistance Project

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[www.bcapcodes.org](http://www.bcapcodes.org)



U.S. DEPARTMENT OF  
**ENERGY**

Energy Efficiency &  
Renewable Energy

## EE 101: Opportunities within the Building Sector

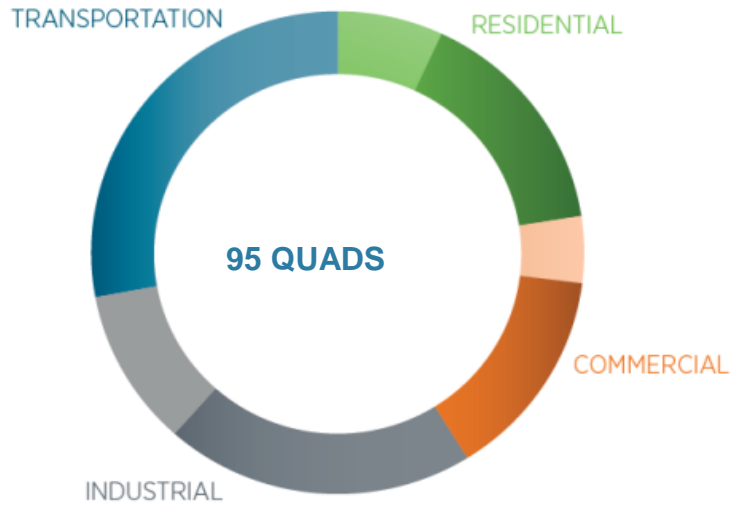
Weatherization & Intergovernmental  
Programs Office

February 2015

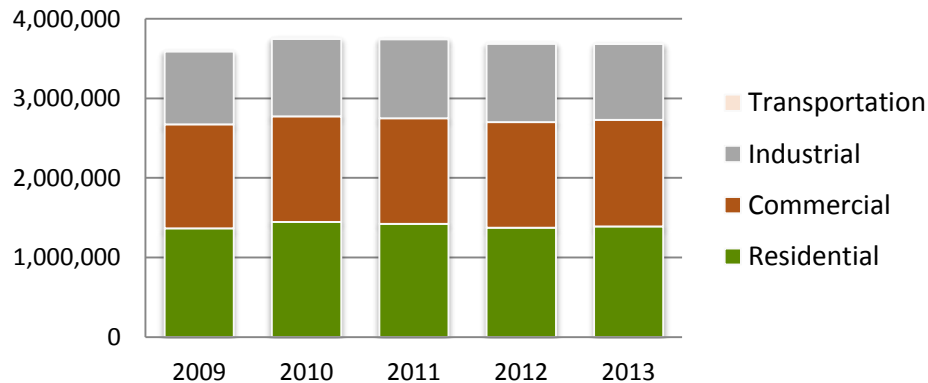
AnnaMaria Garcia  
Director

# National Picture

PRIMARY ENERGY USE BY SECTOR



ELECTRICITY USE BY SECTOR (million kWh)



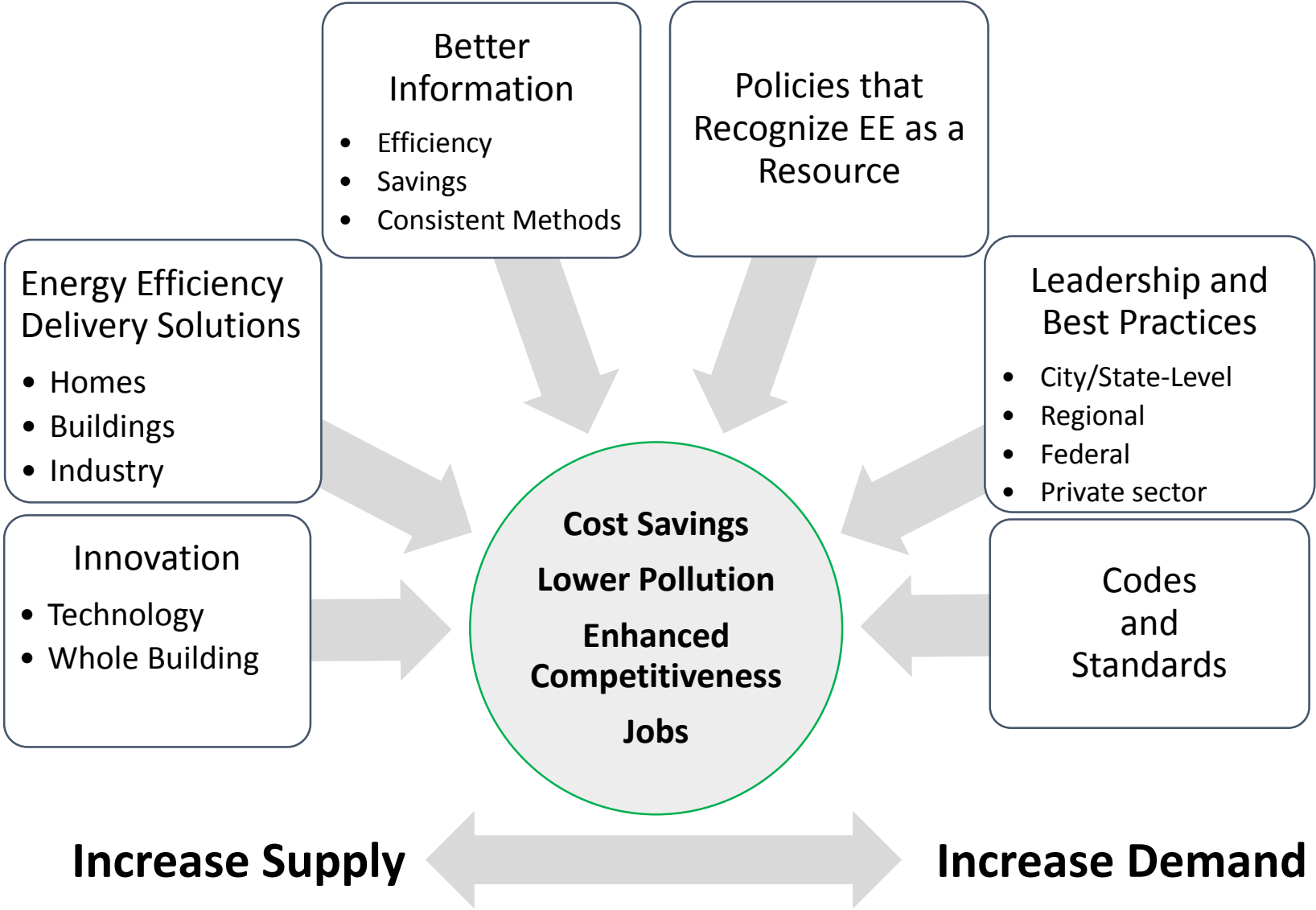
## Built Environment

- Residential 21%
- Commercial 19%
- Industrial 32%
- Electricity Use 38 Quads
- Energy Bill

## Benefits

- Environment
- Jobs
- Savings
- Energy security
- Lower costs with less need for energy infrastructure

# Energy Efficiency Roadmap





# Emerging Technologies: Advancing Whole Building Efficiency

**Advanced windows**

**Advanced refrigerator technology**

**Low global warming potential refrigerants (working fluids)**

**Heating, ventilating, air conditioning, water heating**

**Window air conditioning**



**Solid state lighting**

**Advanced heat pump technology:**

- Air source heat pumps
- Cold Climate Heat Pumps
- Ground source heat pumps
- Heat exchangers

**Building envelope:  
Next generation attic and roof systems**

**Sensors, controls, and storage**

By 2020, introduce cost-effective next generation energy saving technologies that lower home and building energy bills 25% or more; by 2030, 50% or more

# WIP Deployment Pathways

Ensure strong state energy and weatherization networks with core capabilities to advance adoption of energy efficiency and renewable energy technologies are actively maintained across the country.

(Formula Funding)



Catalyze a few key innovative state, local and tribal clean energy programs, policies and projects that are high impact and self-sustaining.

(Competitive Funding)



Help state, local and tribal innovations achieve scale by applying “best practice tools”, “lead by example” methods, peer to peer forums and strategic partnerships.

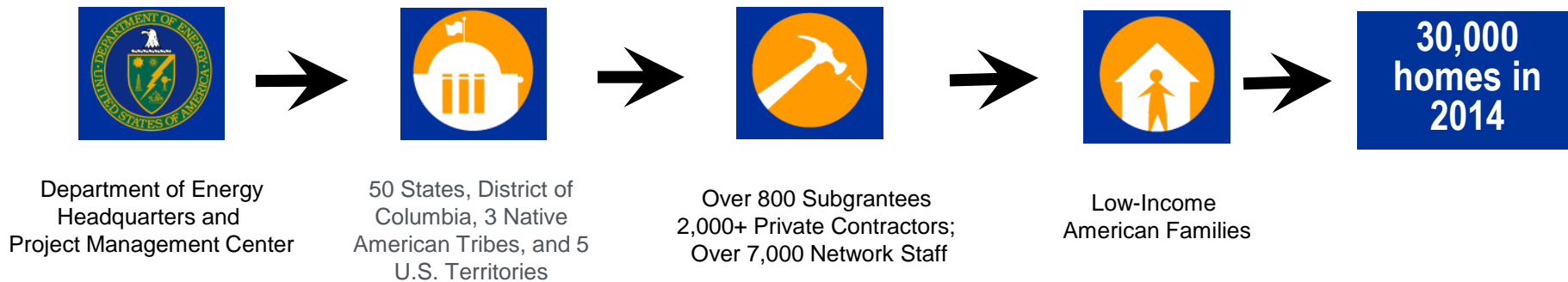
(Technical Assistance, BB Challenge, Solution Center, Other Initiatives)



MARKET IMPACT

# Weatherization Assistance Program

- The mission of WAP is “To reduce energy costs for low-income households by increasing the energy efficiency of their homes, while ensuring their health and safety
- DOE administers the WAP as a categorical grant and allocates funds by formula to grantees for the purpose of providing these residential select energy efficiency services throughout the country.
- The network for delivery of WAP is mandated by enabling legislation as follows:



- Families with annual incomes less than 200% of the OMB Poverty Guidelines are eligible to receive the WAP. Families must produce evidence of income for all wage earners to determine eligibility.
- Eligible homes selected each year receive an energy audit to determine which cost effective measures should be installed. The auditor also records any significant energy related health and safety measures that need to be installed prior to WAP work.
- Crews and/or contractors are dispatched to install the energy efficiency measures that include but are not limited to: air infiltration reduction, water system treatment, building envelope insulation, furnace repair and/or replacement, and other minor energy repairs.
- Every home receives a quality control inspection prior to being reported to DOE as complete.
- Grantees report expenditures and production on a quarterly basis.

# WAP Technologies

- Applied technologies WAP can use in low-income residences fall into these categories:
  - Building shell measures
  - Mechanical measures
  - Electric base-load measures
  - Health and safety measures
- Technologies can be considered for addition to the program upon petition and demonstration of cost-effectiveness
  - New/updated EE technologies
  - RE technologies – some being tested through a set of WAP competitive awards

# State Energy Program (SEP) Formula Funding

## Formula Funding

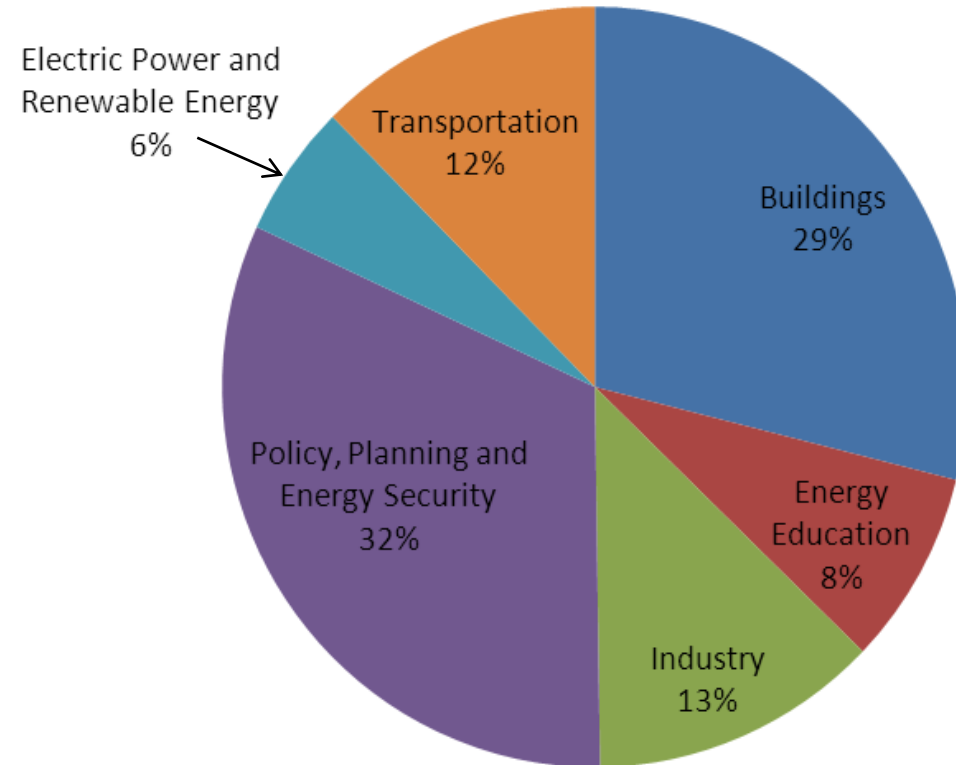
### Eligible Activities

- Demonstrations of EE & RE technologies
- Public education on EE & RE
- Increasing transportation efficiency
- Financing for EE & RE projects
- Energy audits & retrofits of buildings and industrial processes
- Emergency Planning
- Demand reduction
- Training & incentives for builders & building designers

### Ineligible Activities

- Research
- Utility rate demonstrations
- New construction
- Purchase land or buildings
- Loan guarantees

## Formula Grant Program Areas 2010-2013



Approximately \$39 M per year allocated to 50 states, DC, and 5 U.S. Territories

# State Energy Program

| 2010 – 2013 Competitive  | 2014 Competitive  |
|--|---|
| <p>Areas of emphasis:</p> <ul style="list-style-type: none"><li>• Statewide energy efficiency targets/goals</li><li>• State lead by example programs for public buildings<ul style="list-style-type: none"><li>• Performance contracting</li><li>• Market segments:</li></ul></li><li>• Policies and programs for industrial energy efficiency and distributed resources.</li><li>• Clean energy economic development roadmaps</li></ul> | <p>Areas of emphasis:</p> <ul style="list-style-type: none"><li>• State energy planning</li><li>• Statewide energy efficiency and renewable energy targets/goals</li><li>• Policies and programs for distributed resources</li><li>• Frameworks for evaluation, measurement and verification of energy and emission reductions</li><li>• Public facilities – financing mechanisms</li><li>• Partnerships with local governments and others to remove barriers, including developing financing mechanisms</li><li>• Building energy performance information for decision-making, including benchmarking and disclosure, aggregation of whole building usage data and data access</li></ul> |

# Better Buildings Initiative: Leaders Developing Replicable Models



- 190+ partners and allies
- Represent 3+ billion square feet; \$2+ B
- 70+ showcase projects
- 40+ implementation models
- Saving more than 2% / year

## 20% Savings Goal

- Establish baseline
- Showcase project
- Implementation model
- Report results

## Better Buildings Accelerators

- 60+ participants
- 3 focus areas: Energy Data, Performance Contracting, Industrial SEM

## Problem-Focused

- Demonstrate specific innovative approaches,
- Improve consistency
- Accelerate investment

## Better Buildings Alliance

- 200+ public & private sector members
- Control 10+ billion square feet
- States, local govts, higher ed, K-12, commercial real estate, hospitality, retail, food service, grocery, healthcare

## Better Buildings, Better Plants

- 120+ companies; 1,800 plants
- Companies represent 8% of total US manufacturing footprint
- Saving more than 2.5% / year

## 20% Savings Goal

- Participate in at least one Alliance activity each year
- Share successes with peers

## 25% Savings Goal

- Establish baseline
- Energy management plan
- Report results

# State and Local Energy Efficiency Action Network

- Network of 200+, led by state and local policymakers, bringing EE to scale
- Provides best practices and recommended approaches on key EE policy/program areas based on state/local experience
- Facilitated by DOE and EPA

## *Recent Highlights*

Credit Enhancement Strategies Webinar

Greater Energy Savings Through Building Energy Performance Policy: Four leading policy and program options

## *Coming Soon*

Energy Efficiency Finance Programs

Insights from Smart Meters: The Potential for Peak-Hour Savings from Behavior-Based Programs



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# Appliance Standards Basics

Rodney Sobin

Director of Research & Regulatory Affairs

Alliance to Save Energy

February 19, 2015

# Appliance Standards Basics

- Specifies minimum energy and/or water efficiency levels
- Standards set by Congress or by DOE as authorized by law
  - Energy Policy and Conservation Act of 1975 (EPCA)
  - National Appliance Energy Conservation Act of 1987 and 1988 (NAECA)
  - Energy Policy Act of 1992 (EPACT 1992)
  - Energy Policy Act of 2005 (EPACT 2005)
  - Energy Independence and Security Act of 2007 (EISA)
- DOE to periodically review and update
- DOE standards go through public rulemaking process



# Appliance Standards Benefits



## Save money:

- Reduced utility bills \$34B in 2010; projected \$64B in 2020 (from standards existing in 2010); \$500 per year for typical household

Appliance Standards Awareness Project (ASAP) , 2011, *Appliance Standards Q&A: Benefits of Appliance Standards*

- Existing & New Standards = \$1.3T cumulative net savings through 2035



# Appliance Standards Benefits



## Save energy:

- 3.6 quads in 2010 (more than all TX and CA households use); projected 5.8 quads in 2020 (from standards existing in 2010)  
[Quad = Quadrillion Btu; U.S. used about 97 quads in 2013]
- Enhances energy reliability, reduce peak loads and grid/supply stresses; reduce emissions; save water



Appliance Standards Awareness Project (ASAP) , 2011, *Appliance Standards Q&A: Benefits of Appliance Standards*

**ENERGY SAVINGS**

**Existing Standards *SAVE 200 QUADS***  
of Energy by 2035

That's enough to meet  
the total U.S. energy needs  
for **two years!**

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# Better Appliances and Consumer Choice

- Refrigerators—

- Better, quieter, more features, on average larger, 1987→2010 real price down 35%, energy down 50%



- Clothes Washers—

- Better, gentler laundering; more cycle options, features; larger tub capacity available; water savings; 1987→2010 real price down 45%, energy down 75%

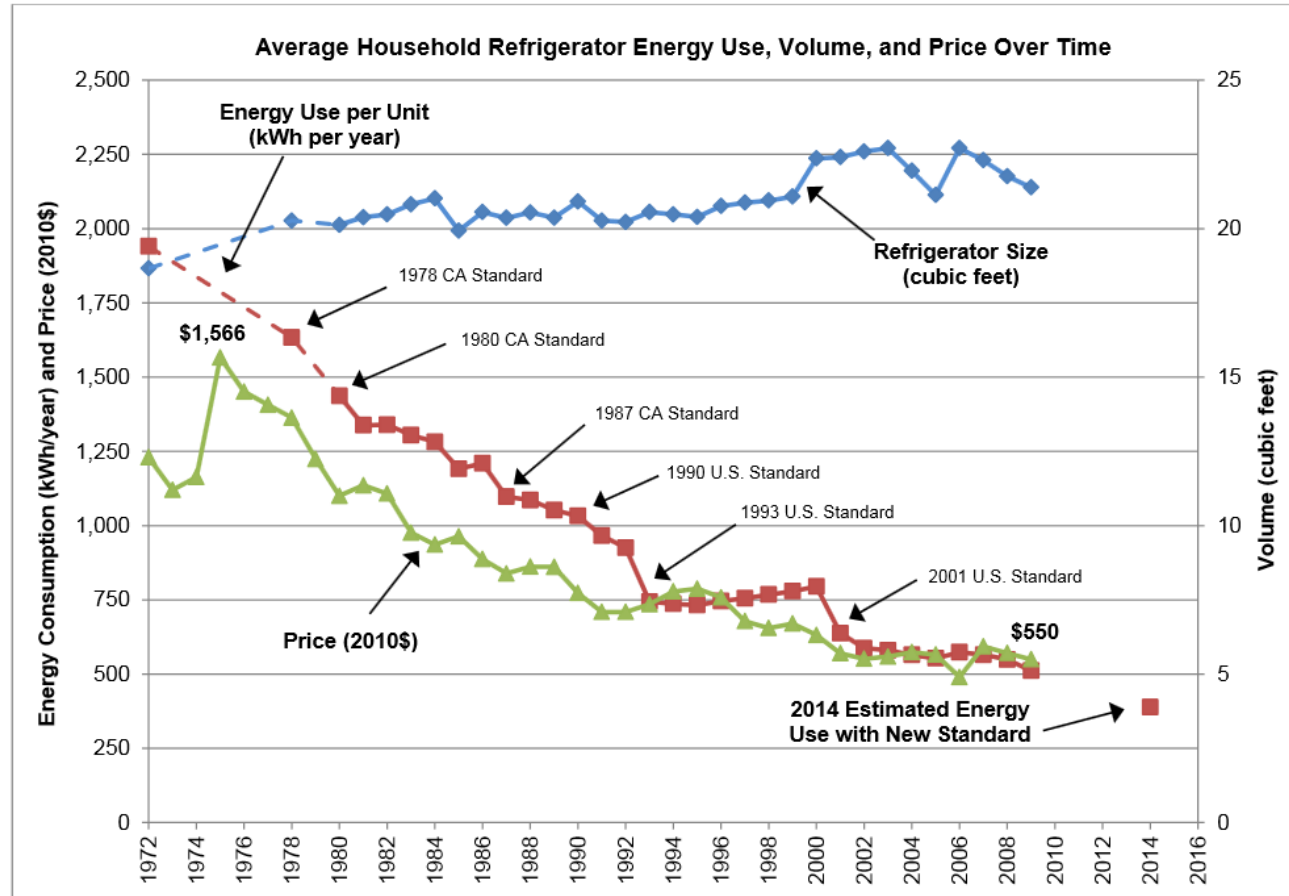


- Dishwashers—

- Good washing performance with less water, energy; less noisy; more cycle options, features; 1987→2010 real price down 30%, energy down 50%

ASAP, 2013, *Better Appliances: An Analysis of Performance, Features and Price as Efficiency Has Improved*, fact sheet.

# E.g., Refrigerator



Sources: Association of Home Appliance Manufacturers (AHAM) for energy consumption and volume; U.S. Census Bureau for price

- Notes:
- a. Data includes standard-size and compact refrigerators.
  - b. Energy consumption and volume reflect the DOE test procedure published in 2010.
  - c. Volume is adjusted volume, which is equal to the fresh food volume + 1.76 \* freezer volume.
  - d. Prices represent the manufacturer selling price (e.g. excluding retailer markups) and reflect products manufactured in the U.S.



THANK YOU!

Rodney Sobin

Alliance to Save Energy

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# About ENERGY STAR® for Alliance to Save Energy Capitol Hill Briefing

Elizabeth Craig, Director  
Climate Protection Partnerships Division  
U.S. Environmental Protection Agency  
February 19, 2015





For more than **20 years**, EPA's ENERGY STAR program has identified the most energy-efficient **products**, **buildings**, **plants**, and **new homes** – all based on the latest government-backed standards.

Today, every ENERGY STAR label is verified by a rigorous third-party certification process.



ENERGY STAR. The simple choice for energy efficiency.



**Today,**  
this little blue label  
does all the hard work  
of certifying outstanding  
energy efficiency in:



ENERGY STAR. The simple choice for energy efficiency.



**Today,**  
this little blue label  
does all the hard work  
of certifying outstanding  
energy efficiency in:

**70**

**Product  
Categories**



ENERGY STAR. The simple choice for energy efficiency.



**Today,**  
this little blue label  
does all the hard work  
of certifying outstanding  
energy efficiency in:

**Buildings  
and Plants  
Across**

**24**  
**Industries**



ENERGY STAR. The simple choice for energy efficiency.



**Today,**  
this little blue label  
does all the hard work  
of certifying outstanding  
energy efficiency in:

90,000  
**NEW  
HOMES**  
Across the Nation



ENERGY STAR. The simple choice for energy efficiency.



Reducing  
the complexity  
of energy  
efficiency to a  
**simple choice.**

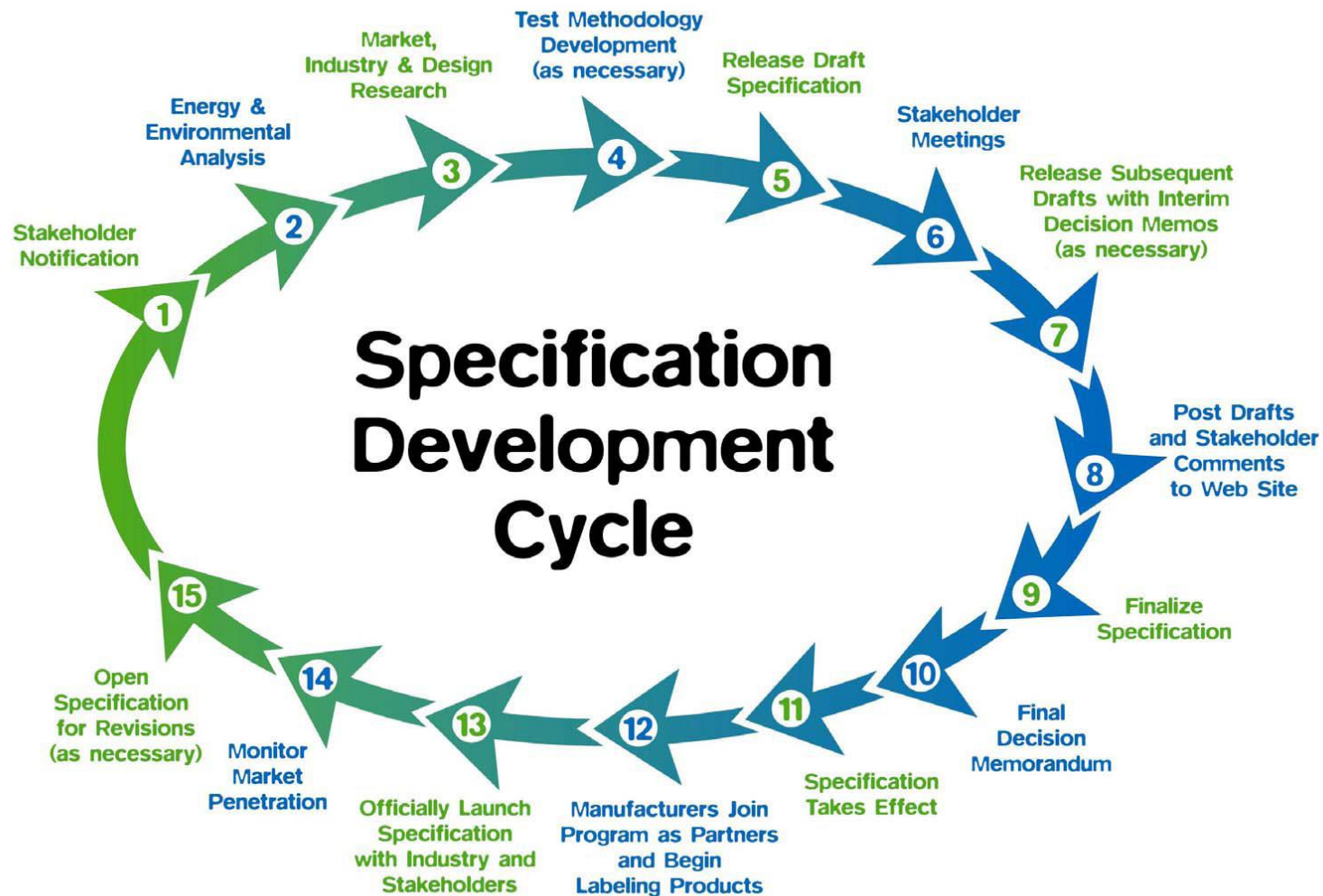




## Strategic Vision and Guiding Principles

- Significant energy savings on a national basis
- Product performance maintained or enhanced with increased efficiency
- Consumers recover investment in efficiency within a reasonable period of time
- Efficiency can be achieved with one or more technologies – products are available from more than one manufacturer
- Energy consumption and performance can be measured and verified with testing
- Labeling would effectively differentiate products and be visible to purchasers

## How Do We Influence the Market?

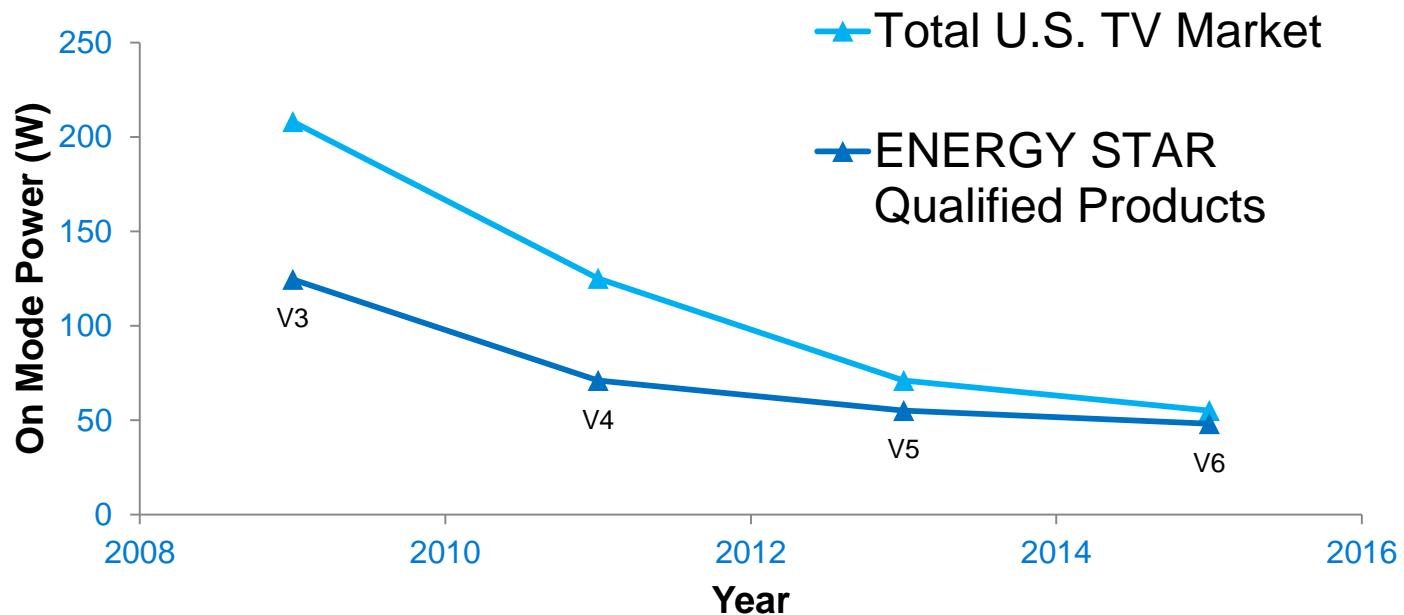






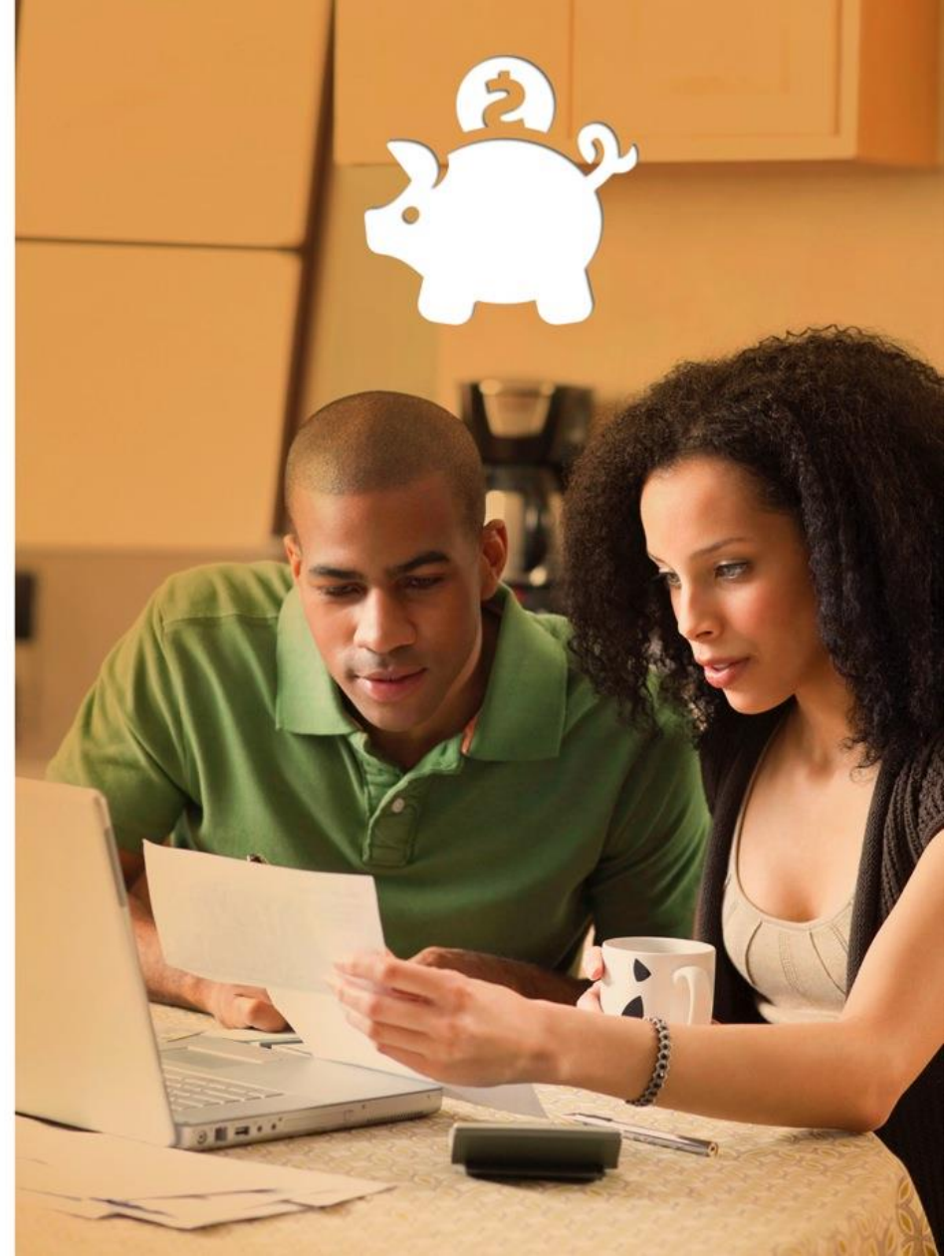
## How Do We Influence the Market?

### Changes in the TV Market & ENERGY STAR



## Work with ENERGY STAR Partners

- In addition to delivering significant energy and dollar savings nationally, the ENERGY STAR program provides critical infrastructure that makes these programs more effective and less resource-intensive to run.
- The ENERGY STAR program is currently leveraged by more than 700 utilities across the country.
  - Through our partnership, these utilities have access to a broad range of market actors who have committed to growing their businesses around energy efficiency
    - More than 1,800 manufacturers
    - More than 2,600 retailers
    - More than 2,200 home builders
    - Many non-governmental organizations
    - Many small businesses, congregations
    - Many service and product providers



Awareness  
now exceeds

85%

and preference  
**is growing**



## ENERGY STAR New Homes

- In the residential sector, ENERGY STAR develops and implements rigorous energy efficiency requirements for homes to earn the ENERGY STAR label.
- ENERGY STAR certified homes are at least 15 percent more efficient than code. Since 1995, more than 1.5 million homes nationwide have earned the ENERGY STAR label, saving American homeowners more than \$4 billion on their energy bills.
- Americans viewed the home improvement section of the ENERGY STAR website nearly 1.5 million times during 2014 to find information about making their homes more energy-efficient.
  - This part of the ENERGY STAR website includes the Home Energy Yardstick and Home Energy Advisor online tools to help people assess their homes' energy use and get recommendations to help reduce utility bills and improve comfort.



**“This label sealed the deal on our new home.”**

**NAME:** Jesse and Melissa Gallo

**THEIR DREAM HOME:** Efficient, comfortable, and ENERGY STAR® certified

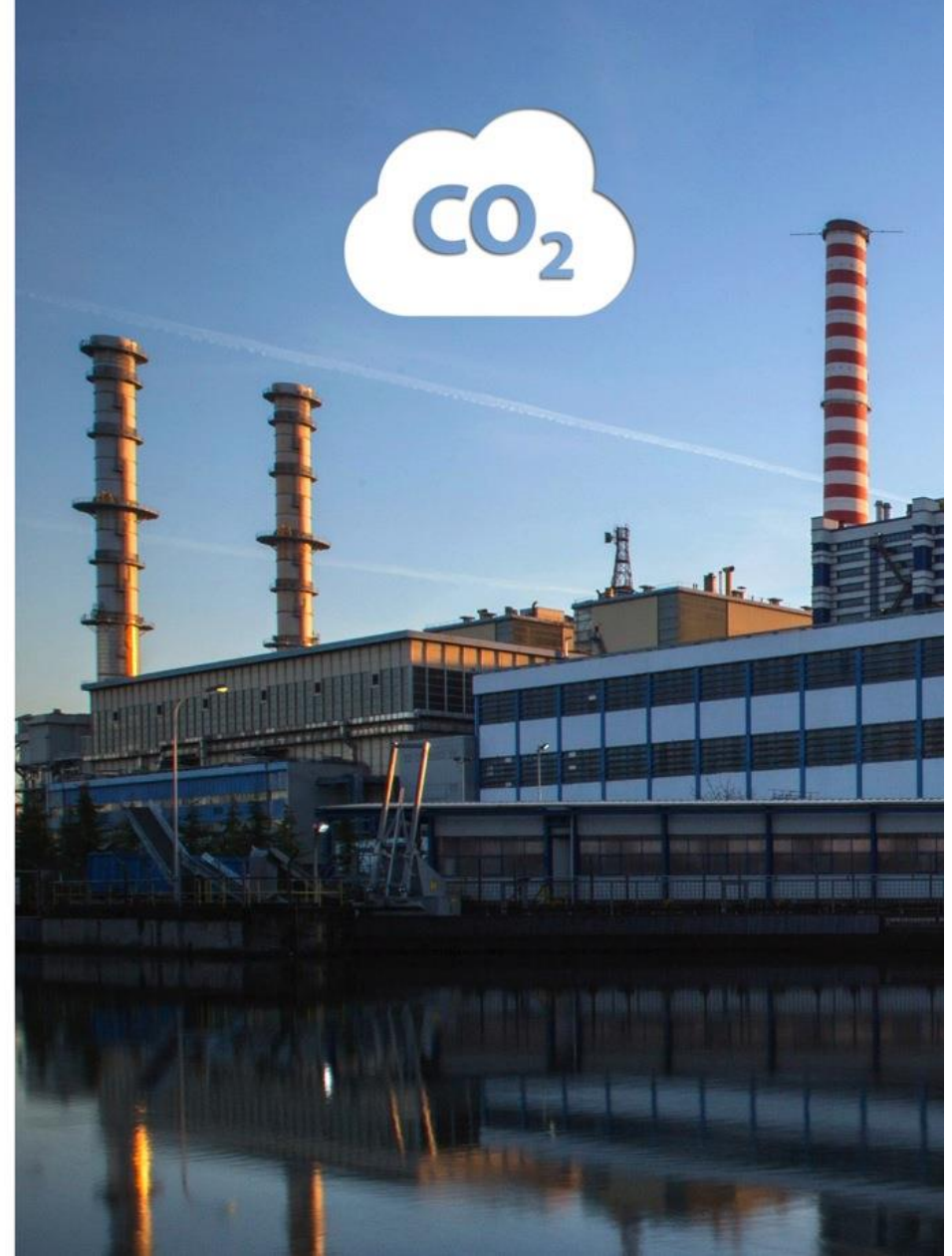
**THEIR SAVINGS:** More than \$550 off their energy bills and more than 11,000 lbs. of greenhouse gases each year.

EPA's blue ENERGY STAR label on the Gallos' new home means a lot. It means their home was designed and built to standards of quality and durability well beyond most others on the market today. It also means that they will save energy and reduce the greenhouse gases that cause climate change for years to come. Visit [energystar.gov](http://energystar.gov).



## Work with Buildings and Plants

- Close to half of the greenhouse gas emissions from energy use are result of running the nation's buildings and plants.
- To capture energy waste, ENERGY STAR developed a robust partnership with thousands of commercial and industrial partners across diverse sectors of the economy.
- With more than **35 billion square feet** of commercial building space using Portfolio Manager, representing about **40%** of the market, EPA's tool is used not only for tracking energy use, greenhouse gas emissions and green power across entire portfolios of buildings, but also water tracking and general sustainability reporting.



## Work with Buildings and Plants

- The 1-100 ENERGY STAR scores were an innovative way to allow building owners for the first time to understand the relative energy performance of their buildings compared to similar buildings nationwide, with EPA awarding ENERGY STAR certification to those that are verified to be in the top 25% nationally.
- After 15 years and more than 25,000 buildings that have earned the ENERGY STAR, these buildings use **35% less energy and emit 35% less greenhouse gases** than typical buildings.
- ENERGY STAR is now being used as a framework and platform for cities, utilities and service providers to connect their constituents to effective energy efficiency practices.



**"We saved enough energy to bring a new middle school off the drawing board."**

Loudoun County Public Schools Superintendent Dr. Edgar S. Helms


NAME: Loudoun County Public Schools, Virginia

IMPROVING ENERGY PERFORMANCE BY: Earning EPA's ENERGY STAR® certification for 46 schools

SAVINGS: More than \$40 million, plus a nearly 300,000 metric ton greenhouse gas emission reduction

RESULTS: Energy savings equaled cost of building their newest middle school

When Loudoun County Public Schools partnered with ENERGY STAR, the idea was to cut energy costs so the savings could go to a better use. In nineteen years, their savings equaled the cost of building a new middle school. Today, that school is a reality. And the energy they're saving reduces greenhouse gas emissions that cause climate change. Put ENERGY STAR to work for you at [energystar.gov](http://energystar.gov).





**ENERGY STAR** is also the most comprehensive resource available for proven energy efficiency guidance.

At **[energystar.gov](http://energystar.gov)**:

- Consumers can find a broad range of tools to help them save more
- Homeowners can assess and find help improving their homes' efficiency
- Businesses can find tools and resources to help unlock greater energy performance



# 16,000

businesses and public sector organizations partner with **ENERGY STAR**





More than **23,000** **buildings and plants**  
have earned the label



More than **1,500,000** **new homes**  
have been certified



To date,  
the **ENERGY STAR**  
program has:

- Prevented 2 billion metric tons of greenhouse gas emissions and
- Saved \$300 billion on utility bills





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*Energy Efficiency: A National Overview of Utility Programs*

February 19, 2015

EE 101: Building Blocks of Energy Efficiency Policy

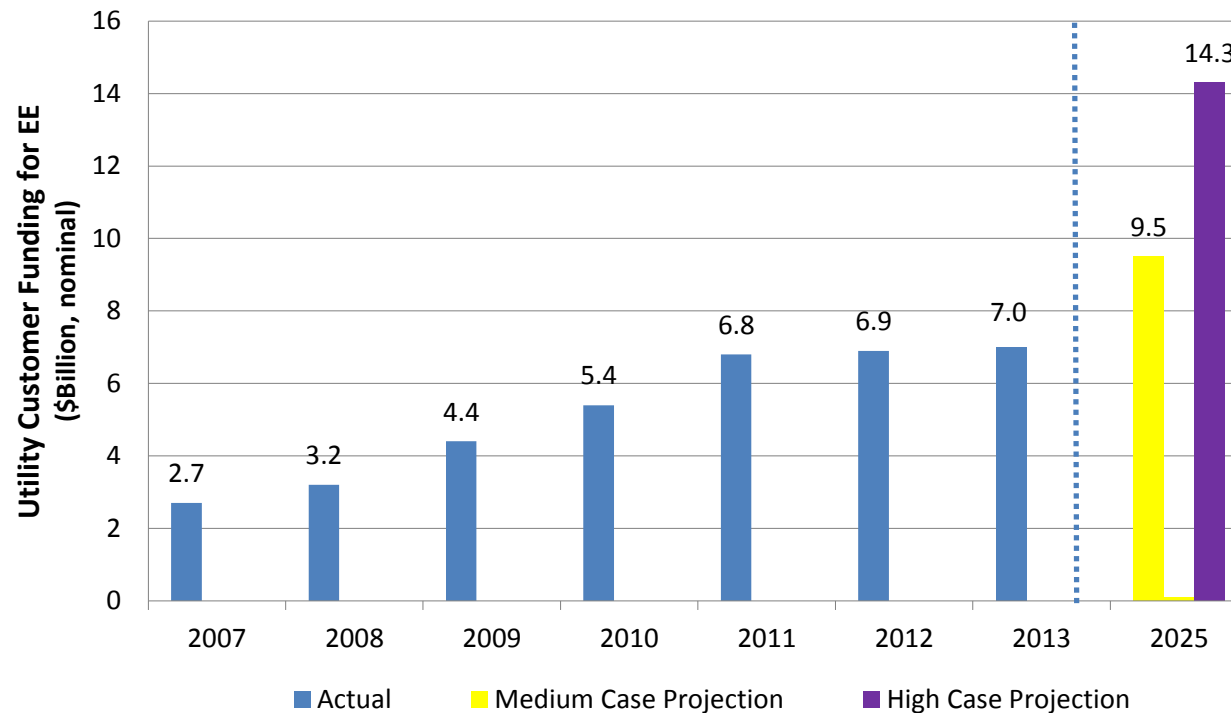
Presented by

Adam Cooper

[www.edisonfoundation.net](http://www.edisonfoundation.net)

# EE Budgets, U.S. (2007-2013 and 2025 Forecast)

## Electric Efficiency Budgets: 2007-2013 and 2025 Forecast



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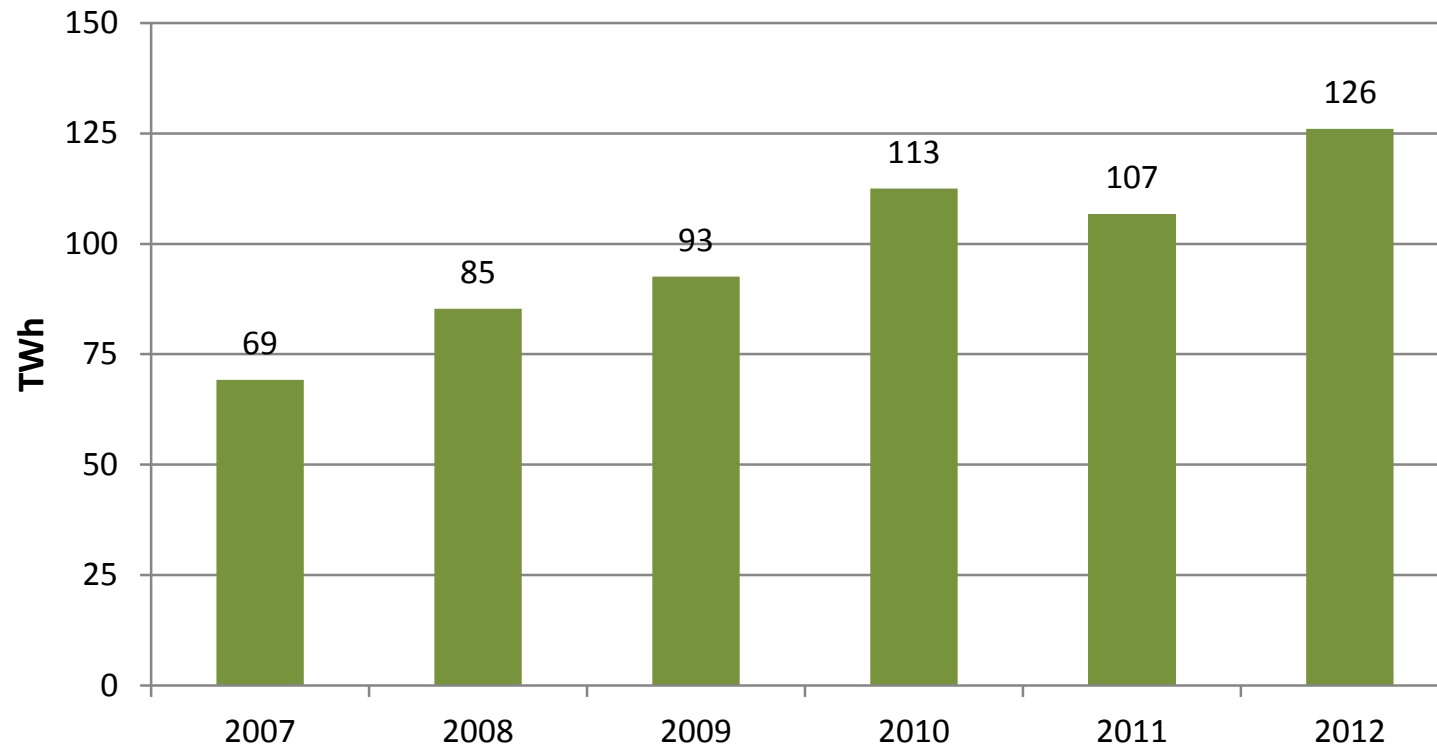


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# EE Savings, U.S. (2007-2012, TWh)

## U.S. Electric Efficiency Savings (2007-2012)



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# Big numbers need context!

- In 2012, electric utility efficiency programs saved 126 TWh of electricity.
- Equivalent to powering more than 12.2 million U.S. homes for one year.
- Avoided the generation of 89 million metric tons of carbon dioxide.
- Anticipate EE program budgets doubling from \$7 billion in 2013 to \$14 billion in 2025.

# Regional profile of EE savings (Aggregate, 2012)

| 2012 U.S. Electric Efficiency Impacts (MWh)--Aggregate |                    |       |
|--|--------------------|-------|
| Region   | Total              | Share |
| MW   | 26,874,450         | 21%   |
| NE   | 20,156,633         | 16%   |
| S  | 16,981,289         | 14%   |
| W  | 61,551,017         | 49%   |
| <b>Total US</b>  | <b>125,563,390</b> |       |

- Energy savings due to past program participation which continues to deliver savings (e.g., installation of a high efficiency refrigerator in 2010 continues to save energy in 2012)
- Energy savings due to customer participation in new programs (e.g., in 2012, a new LED product rebate is offered; customer purchases and installs LED in 2012)
- Energy savings due to new participants in an existing program (e.g., high efficiency refrigerator rebate is still available; customer uses rebate offer in their purchase of an eligible new refrigerator)

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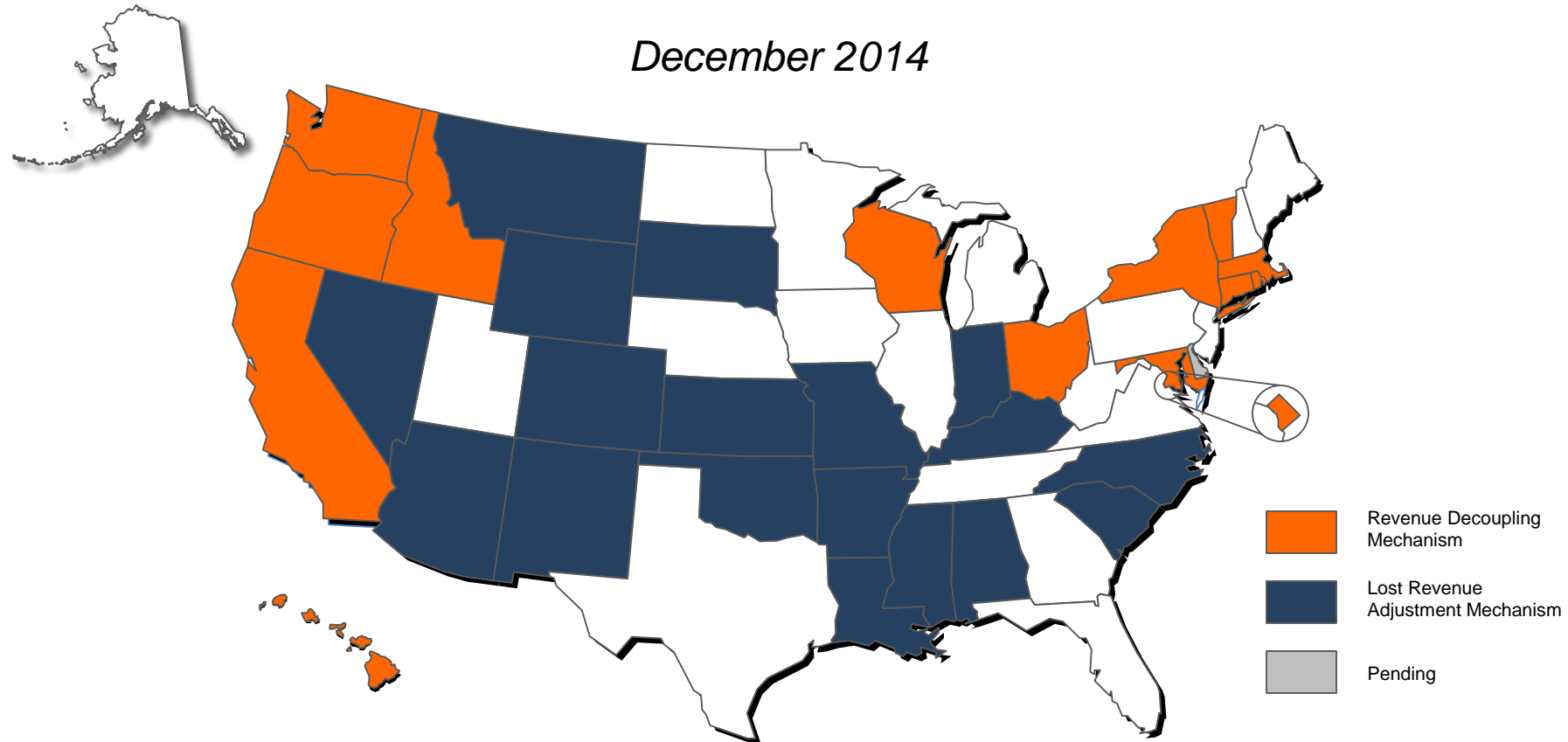


# Policies driving energy efficiency

- Regulatory policies
  - Fixed cost recovery mechanisms/decoupling
  - Performance incentives
- Energy efficiency resource standards (EERS)
- Energy codes and national appliance/equipment standards becoming more stringent



# Fixed Cost Recovery and Decoupling Mechanisms – Electric Utilities



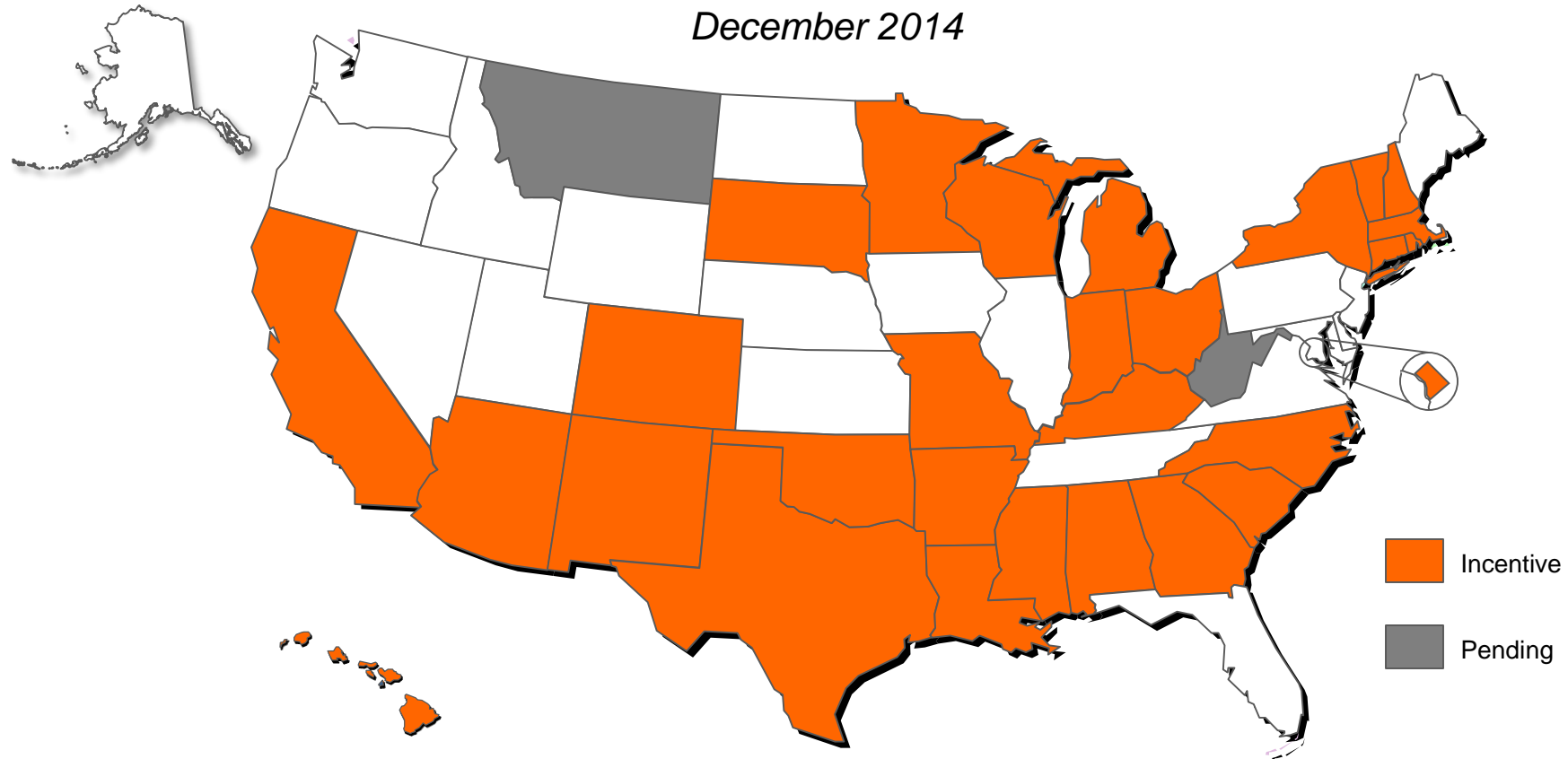
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# Performance Incentives



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# ...many states now have an energy efficiency resource standard (2014)



Source: ACEEE



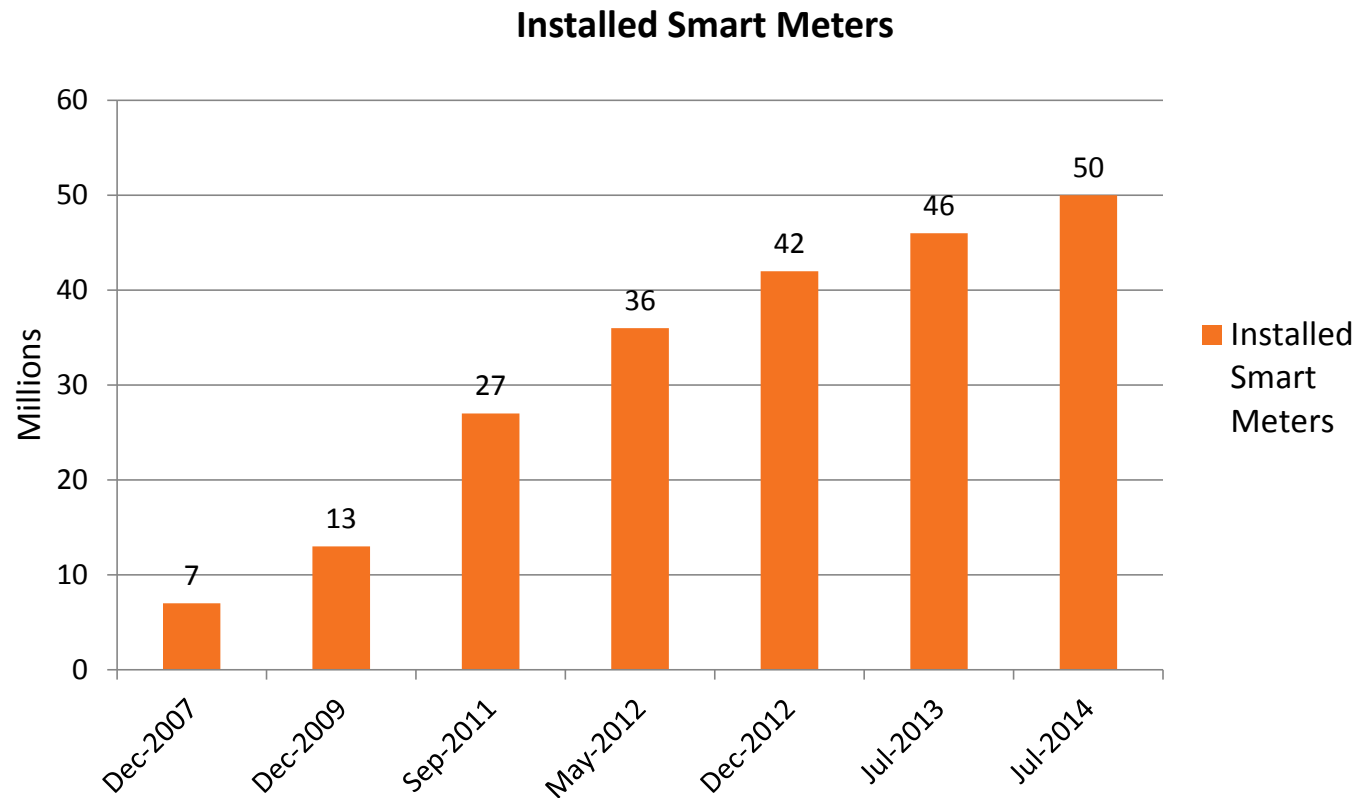
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# Smart grid technologies are playing a role in energy efficiency too

- Smart meter deployment
  - > 50 million deployed
- Networked customers opens door to possibilities
  - > Energy management
  - > Smart technologies in home or business



# Smart meter installations in the US: 2007-2014 (millions)



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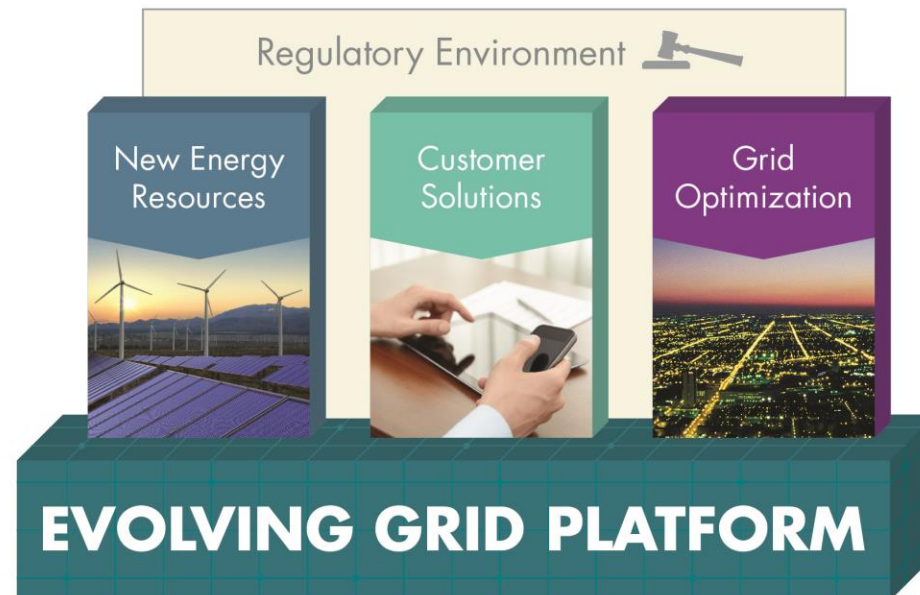
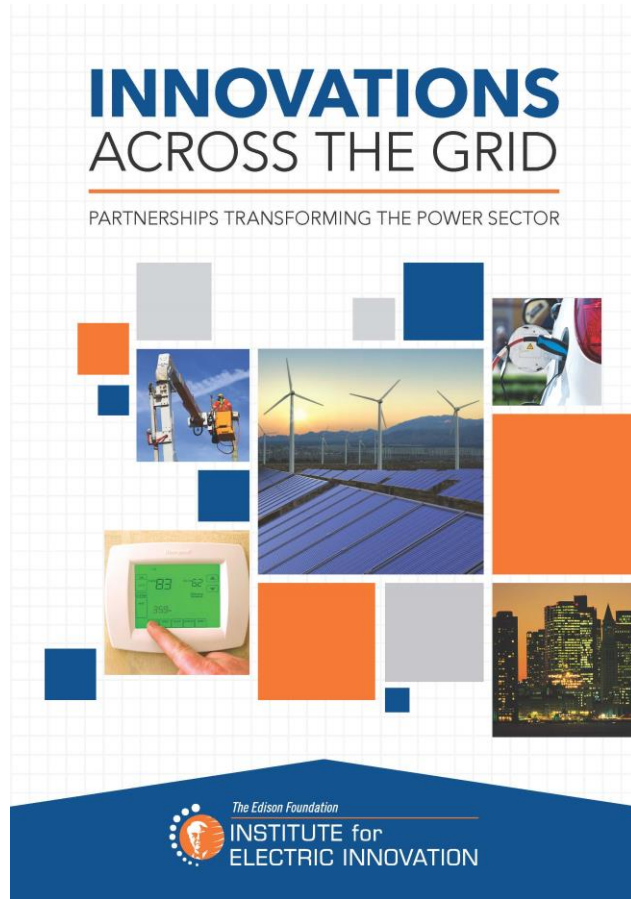
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# On December 11, IEI released Innovations Across the Grid, Volume II



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# Federal Energy Savings Performance Contracts

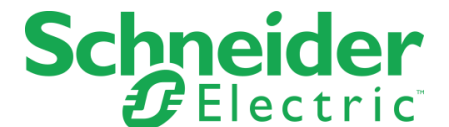
Congressional Presentation

February 19, 2015

Anna Pavlova

VP, Government Relations

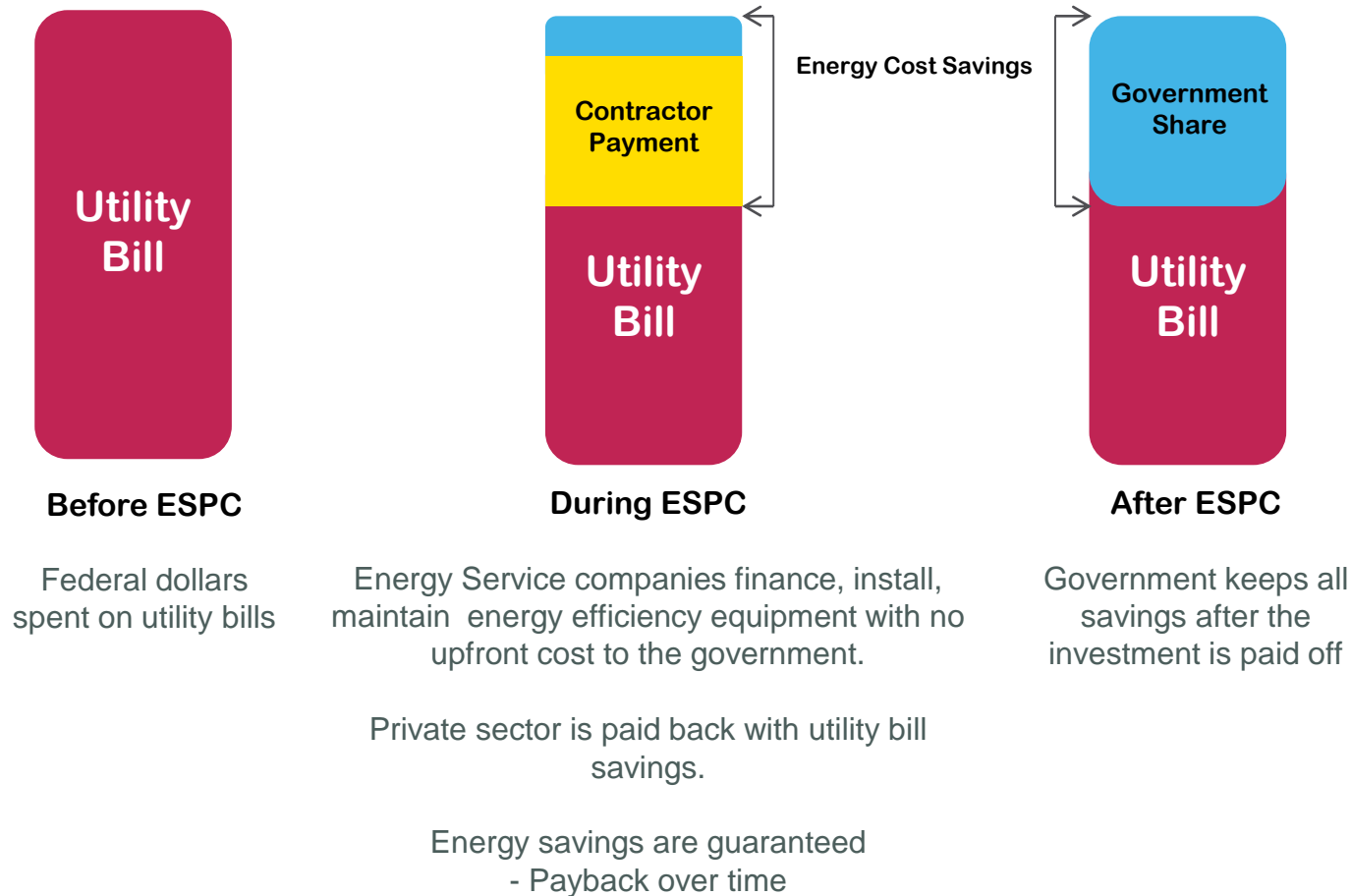
Schneider Electric





# FINANCING ENERGY EFFICIENCY AND ENERGY MANAGEMENT AT NO UPFRONT COST TO FEDERAL GOVERNMENT:

## Energy Savings Performance Contract (ESPC)



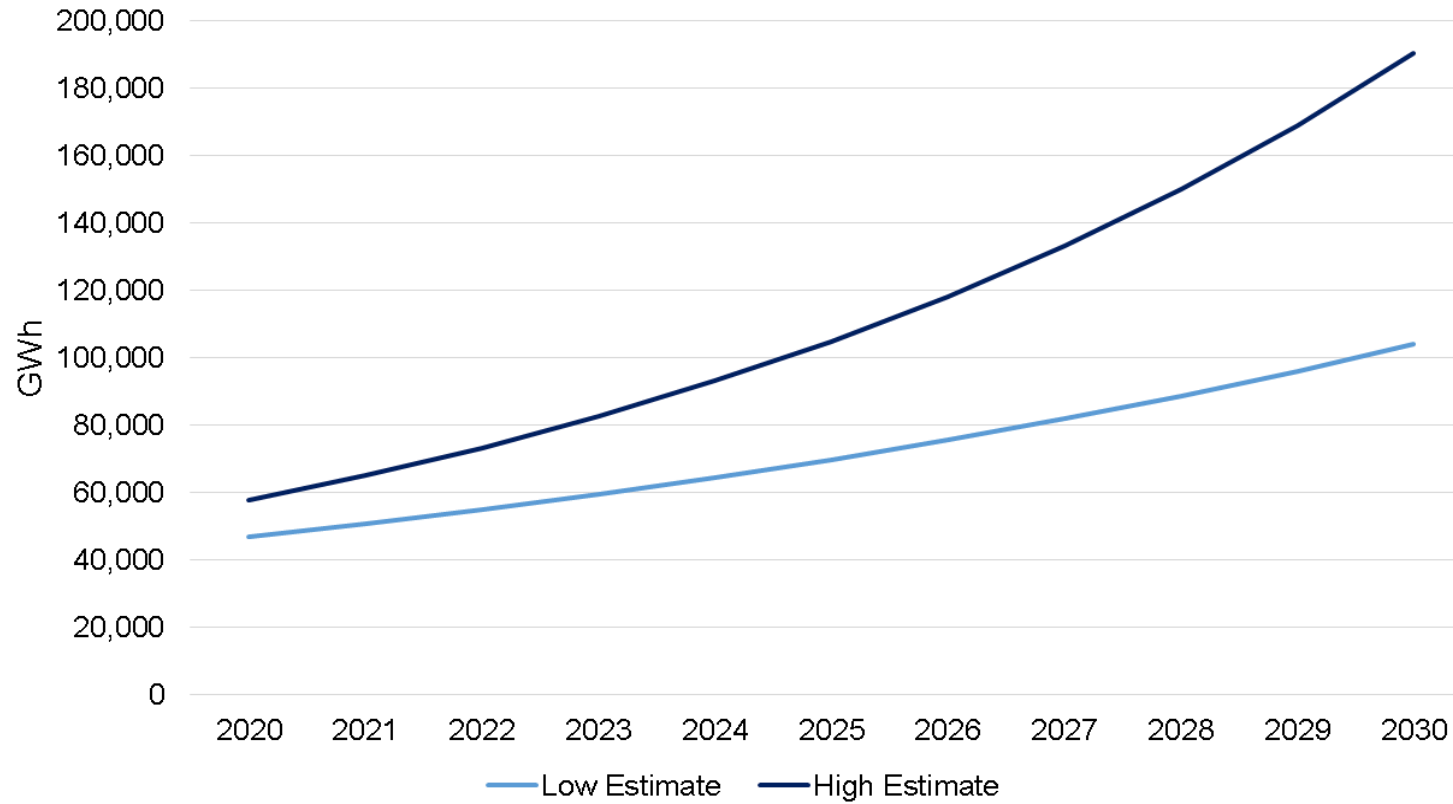
# Energy Savings Performance Contracts (ESPCs)

- > Federal, state, and municipal buildings
- > Universities, school districts, hospitals
- > Upgrades to improve energy performance in public buildings
- > Result in reduced utility bills, i.e. reduced taxpayer expenditures
- > No up-front costs to the client (government, school, hospital)
- > Bi-partisan issue. Supported by Citizens Against Government Waste, Americans for Tax Reform, and other fiscally conservative organizations.





### Figure 7: Potential Cumulative Electricity Savings from PC Projects



*Figure represents estimates and analysis made by ESCO working group and does not present actual or forecasted projections*



## ***FEDERAL ENERGY EFFICIENCY GOALS***

- > Established in EPCACT 2005
- > Accelerated in EISA 2007
- > Annual reductions, resulting in 30% reduction of energy use in federal buildings by 2015 from 2003 baseline
- > Expire in 2015

# Make the most of your energy<sup>SM</sup>

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*Alliance to Save Energy:  
“EE 101: Building Blocks of  
Energy Efficiency Policy”*

January 29, 2015

Timothy D. Unruh  
PhD, PE, CEM  
Program Manager  
DOE FEMP

# Agenda

- Who is FEMP?
- Government Progress
- US Federal Government is Providing Leadership
- How Can FEMP help further improve our nation's energy productivity?





# FEMP's Role is to Facilitate Action

*FEMP works with Federal agencies to deploy technologies, tools, and knowledge within the Federal Government through:*

- Project Financing
- Technical Assistance and Guidance
- Planning, Reporting, and Evaluating
- Federal Fleets
- Federal Energy Efficiency Fund (FEEF)

# Authority/Requirements for Federal Government



## Statues

- National Energy Conservation Policy Act
- Energy Policy Act of 1992
- Energy Policy Act of 2005
- Energy Independence and Security Act of 2007
- 2010 Federal Buildings Personnel Training Act

## Executive Orders

- Executive Order 13423: Strengthening Federal Environmental, Energy, and Transportation Management
- Executive Order 13514: Federal Leadership in Environmental, Energy, and Economic Performance

## Presidential Memorandums

- Federal Leadership on Energy Management- Dec. 5, 2013
- Implementation of Energy Savings Projects and Performance-Contracting for Energy Savings- Dec. 2, 2011

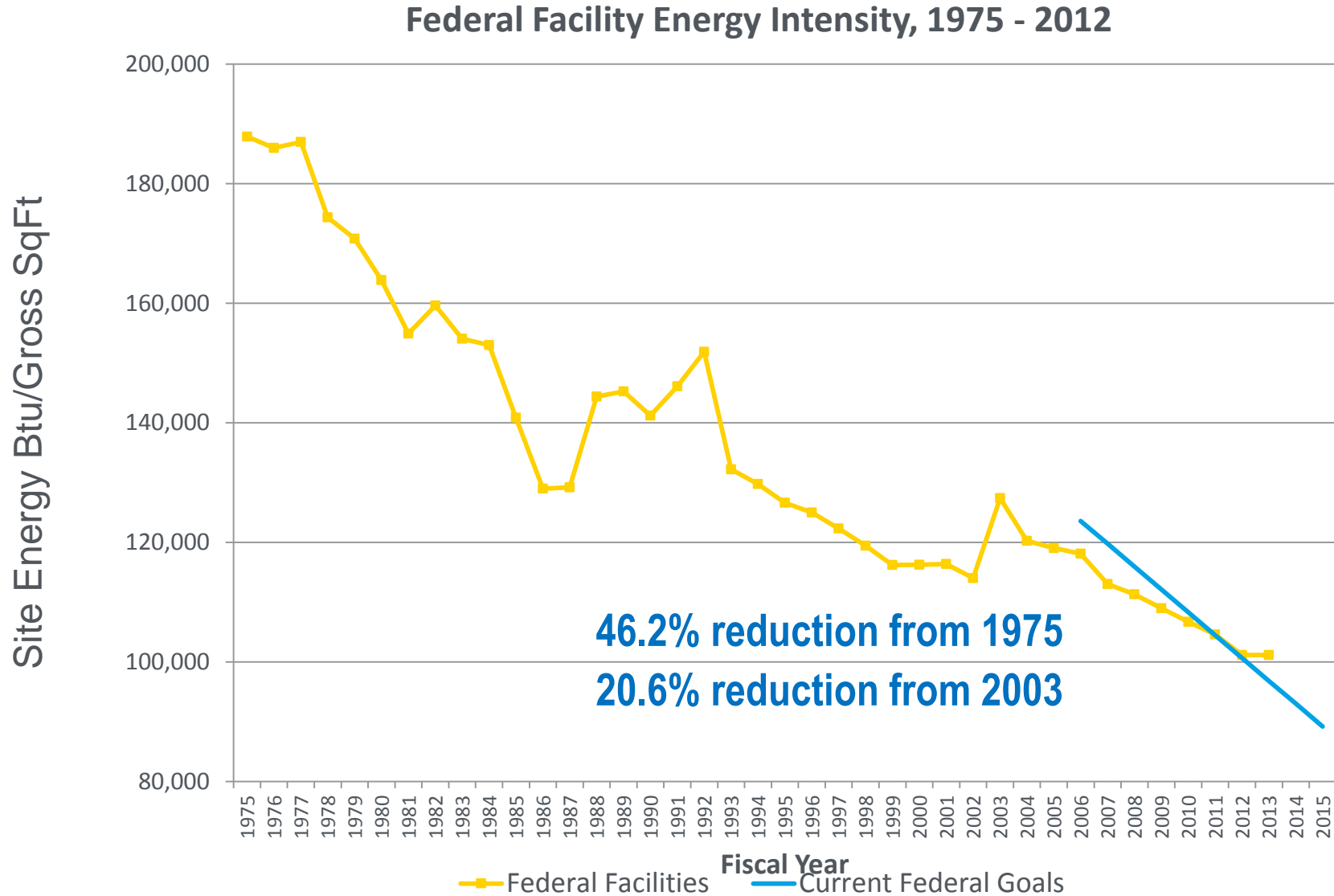
# US Federal Government-Wide Energy Usage

***The US Federal government consumes roughly 1 quadrillion Btu/year (>1 Exajoule/year) delivered on-site energy in buildings, vehicles, and operations***

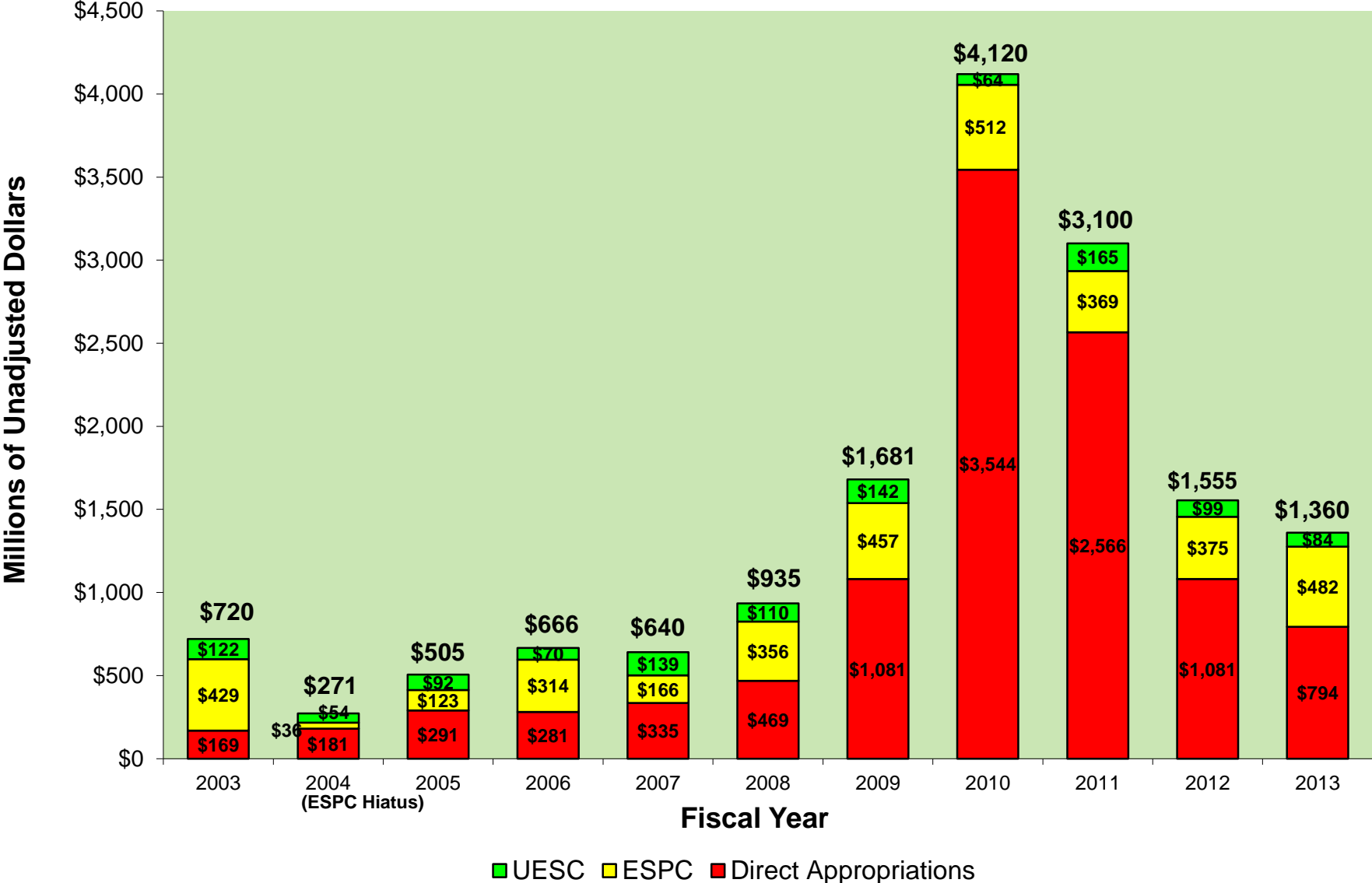
Operates more than 350,000+ facilities comprising roughly 2.7 billion square feet

Spent approximately \$6.8 billion in Fiscal Year 2013 on energy costs for facilities

# The Long Road of Progress



# Efficiency Investments Government-Wide



PRELIMINARY DATA

# US Federal Government is Providing Leadership

## ■ Building Energy Use

- The Federal Government has reduced energy intensity lower than similar commercial buildings
  - **GSA:** 62,316 (Btu/GSF) vs. **CBECS:** 89,838 (Btu/GSF)
  - **VA:** 156,657 (Btu/GSF) vs. **CBECS Hospital:** 187,878 (Btu/GSF)

## ■ Renewable Energy Use

- Federal Government **9.2%** vs. Total Renewable Energy used by Nation in 2013 **1.77%**

## ■ Sustainability

- Federal government has certified **1,031 buildings to LEED (3,000-plus projects are in certification pipeline) of the ~350,000 owned/leased federal buildings** vs. United States has certified **~54,000 buildings to LEED of ~4.8 million commercial buildings**

## ■ Efficient Investment

- Federal Government has **invested a combined \$6.11B** into Energy Savings Performance Contract (ESPC) and Utility Energy Service Contracts (UESC)

## *How Can FEMP help further improve our nation's energy productivity?*

### ■ ***Performance Contracting***

- Continuing to promote public-private partnerships to address limited agency budgets
- Leverage federal government resources to create a common platform for performance-based contracting, the public sector and private sector

### ■ ***Technical Assistance and Guidance to Agencies***

- Renewable energy project assessments utilizing FEMP REOpt tool
- Focused customer service thru Greengov award winning approach with DOT
- High performance technology challenges and campaigns (e.g., data centers) – some across public and private sectors
- Federal Energy Efficiency Fund (FEEF) leveraging key technologies and best practices

### ■ ***Training***

- Creating multiple levels of online training to fulfill the Federal Personnel Training Act
- Provide continuing education credits (CEUs) through International Association for Continuing Education and Training (IACET)

# How Can FEMP help further improve our nation's energy productivity?

## ***Where has FEMP Reached beyond the Federal Realm***

- ***eProject Builder***
  - State and Local Governments utilize system
- ***Data Center Challenge***
  - Challenge uses Private and Public partners to improve accountability
- ***Training***
  - Courses focus on Federal, but many students are non-Federal related, as topics provide information for all buildings
- ***Institutional Change***
  - Training Courses provided to anyone attending Behavior, Energy and Climate Change Conference, seeing FEMP processes utilized outside of the Federal Government
- ***Federal Better Buildings Award***
  - Using EPA nationwide program to issue Federal Awards



# Questions?

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