

# How DOE is Helping States Adapt and Respond to Change



U.S. DEPARTMENT OF  
**ENERGY**

Energy Efficiency &  
Renewable Energy

Kathleen Hogan  
Deputy Assistant Secretary of Energy Efficiency  
July 2017

# Outline

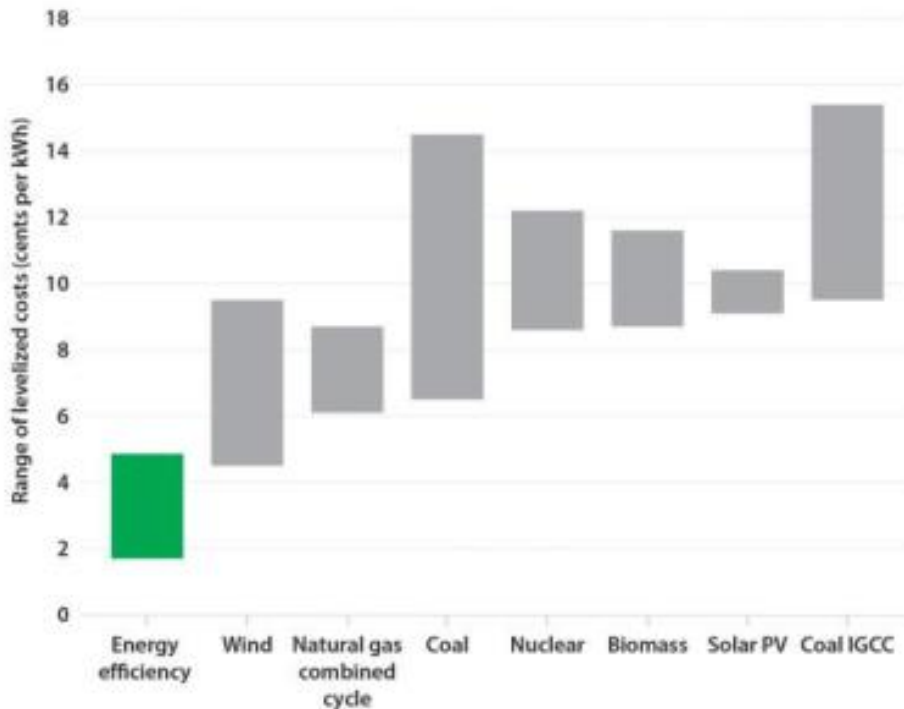
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- Energy Efficiency as a Resource
- EE Potential Studies
- Federal Appliance Standards
- Better Buildings
- Industrial and Large Energy Users Work
- Federal Energy Management Program
- State and Local Outreach and Resources
- SEE Action

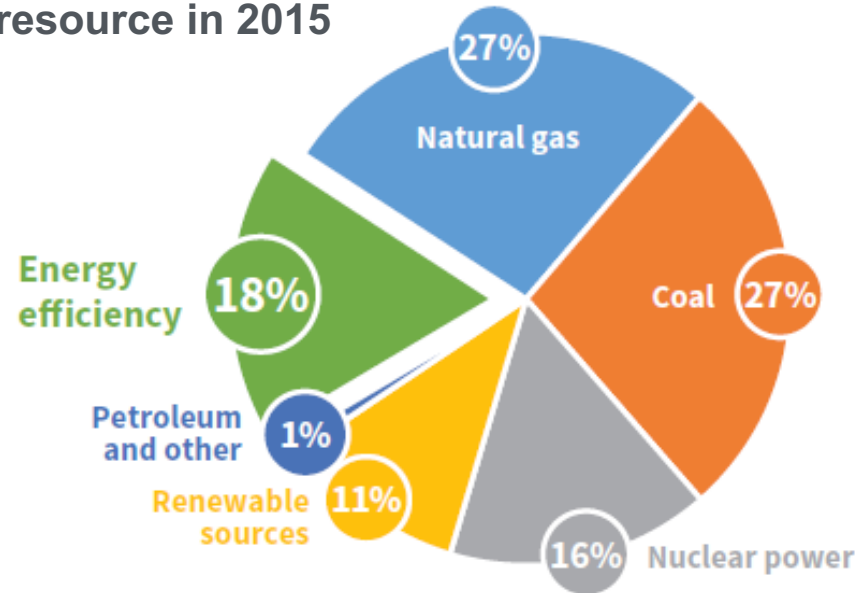
# Energy Efficiency

- Large part of U.S. energy pie
- Large low cost energy resource

## Saved energy is low cost energy



Share of US electricity generation by resource in 2015

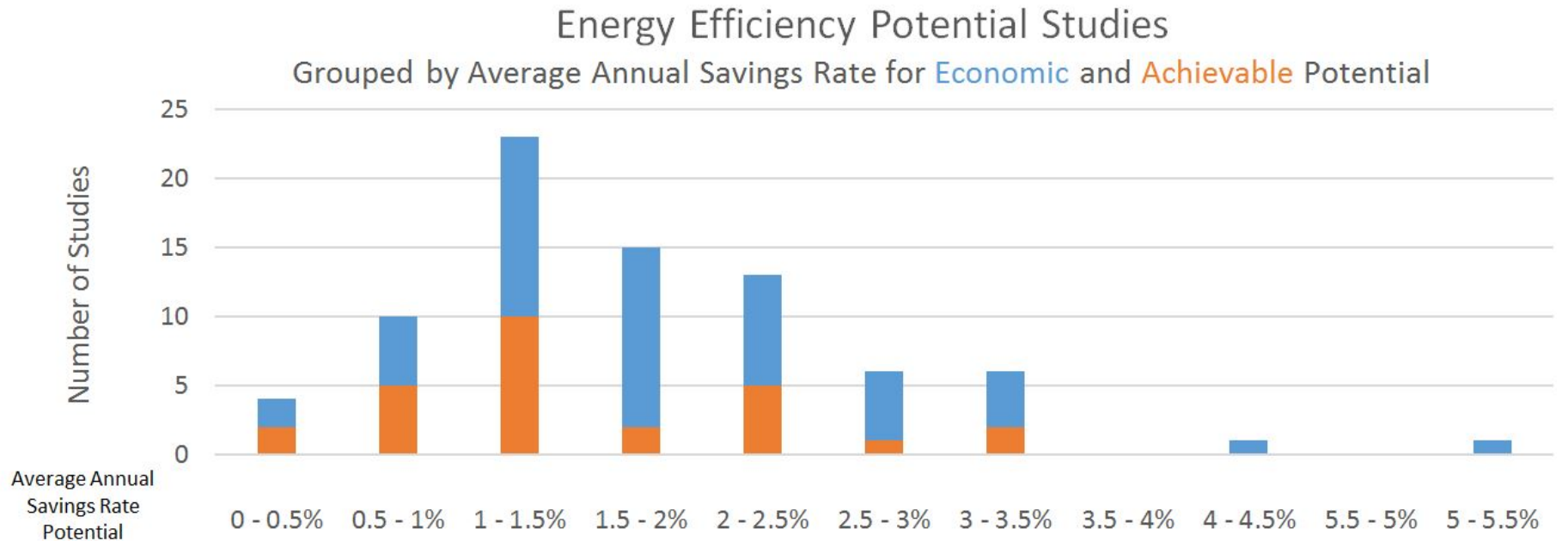


Sector	Levelized CSE (6% Discount) (\$/kWh)
Commercial & Industrial (C&I)	\$ 0.021
Residential	\$ 0.018
Low Income	\$ 0.070
Cross Sectoral/Other	\$ 0.017
<b>National CSE</b>	<b>\$ 0.021</b>

ACEEE (2016), ACEEE (2014), LBNL (2014)

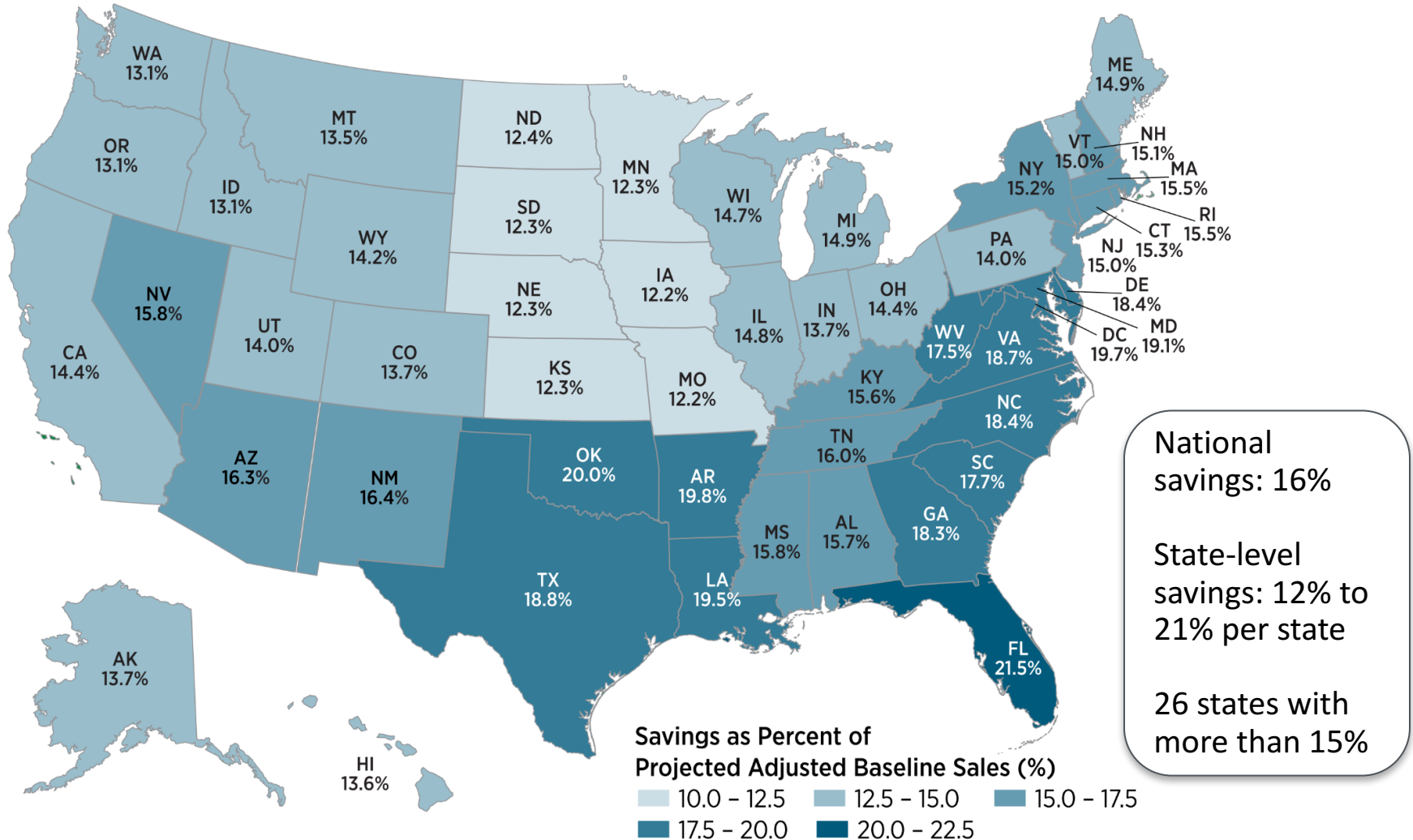
# Energy Efficiency Potential

## Diverse State/Utility Analyses Show 1.0-2.5% Average Annual EE Potential



# Large Potential for Savings in Every State

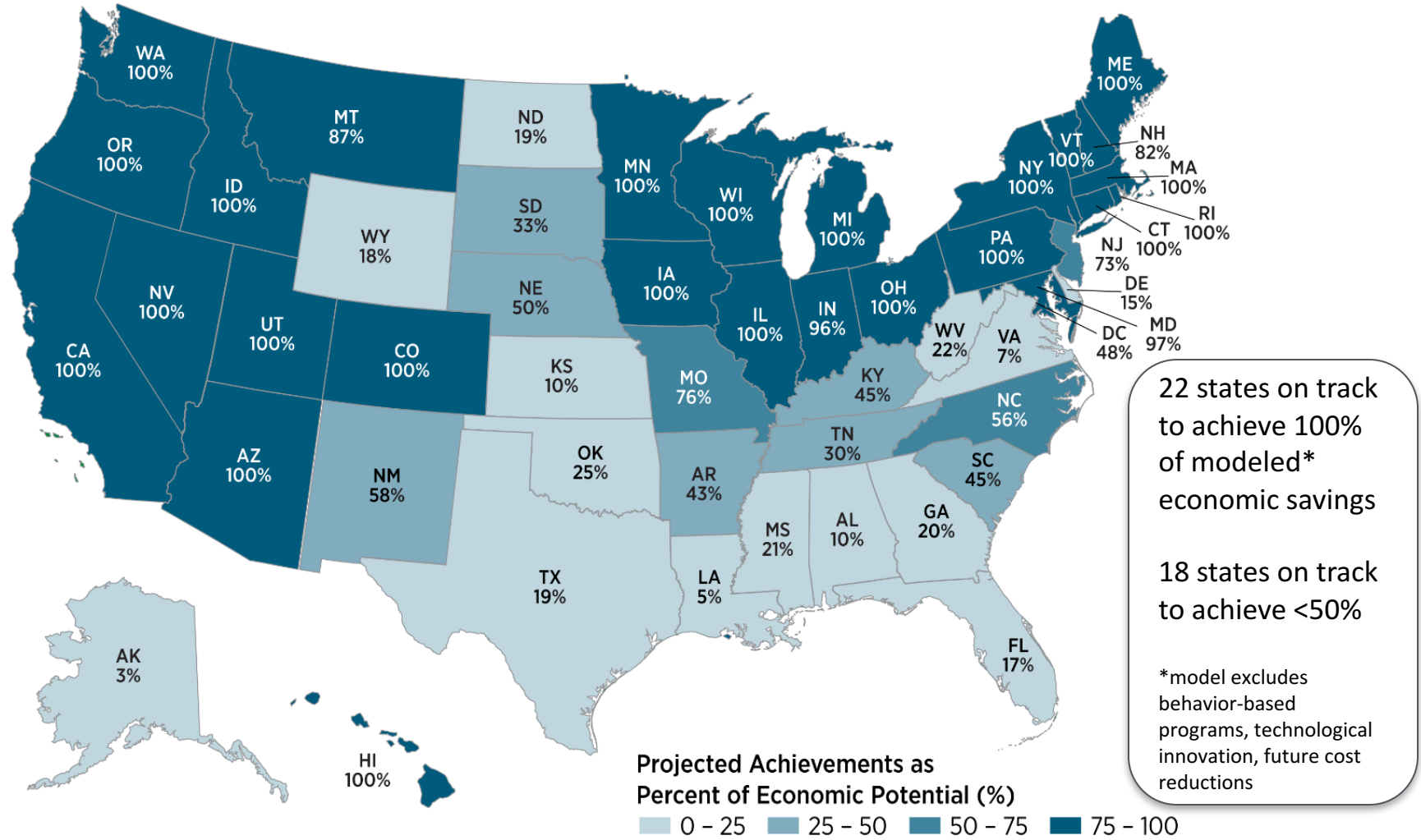
First consistent economic EE potential study across all states: residential, commercial, industrial equipment turnover



Source: Electric Power Research Institute (EPRI), 2017. [State-Level Electric Energy Efficiency Potential Estimates](#)

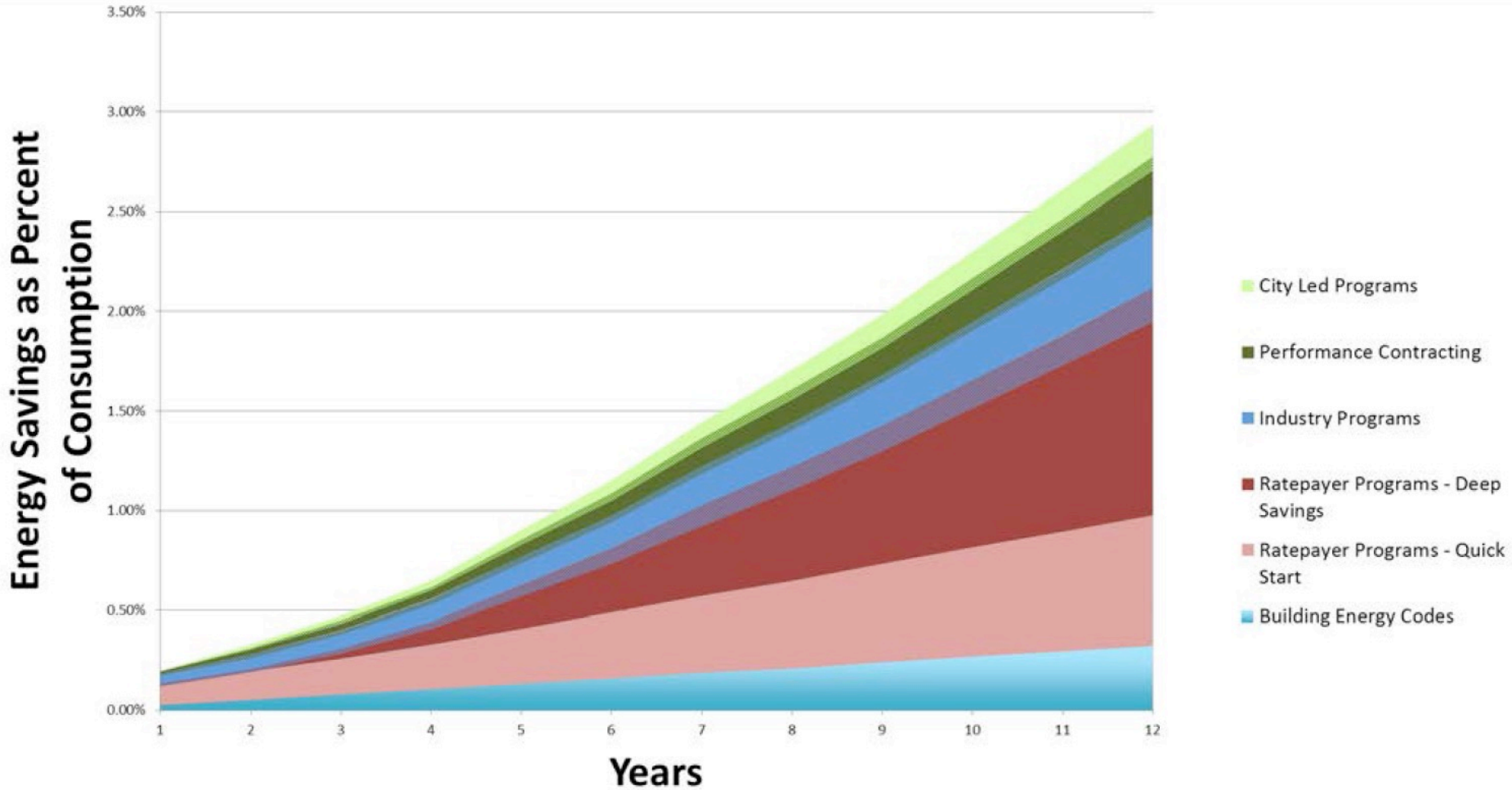
# State Progress Towards Achieving EE Potential Varies Widely

Electricity Savings that could be Achieved through Continuation of Current Approaches (2016-2035) as Percent of Modeled Economic Potential by State



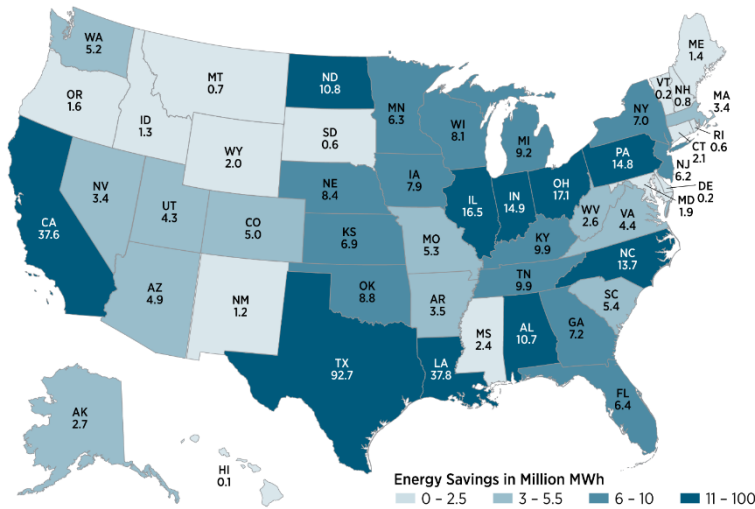
Source: Electric Power Research Institute (EPRI), 2017. [State-Level Electric Energy Efficiency Potential Estimates](#). Data on savings rates from ACEEE State Scorecard.

# Top Energy Savings Opportunities

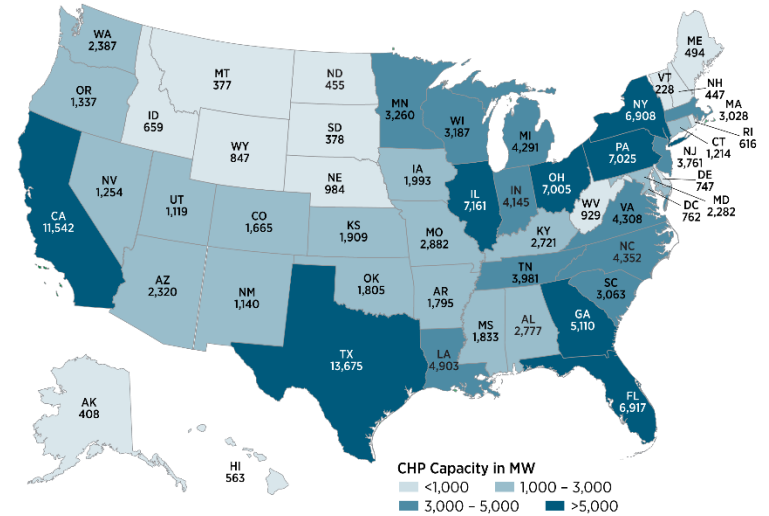


# New Analyses of State-Specific Savings Opportunities from: Industrial, CHP, Building Codes, Residential EE

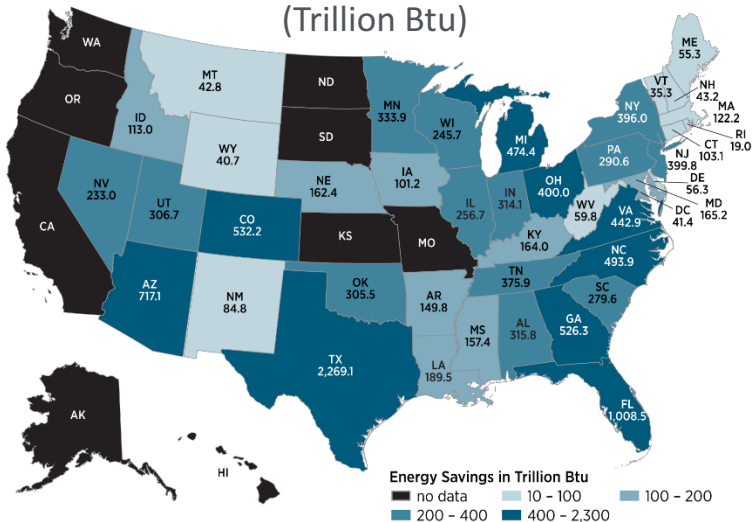
Estimated Economic Potential Electricity Savings by State (2030) from **Industrial EE** (million MWh)



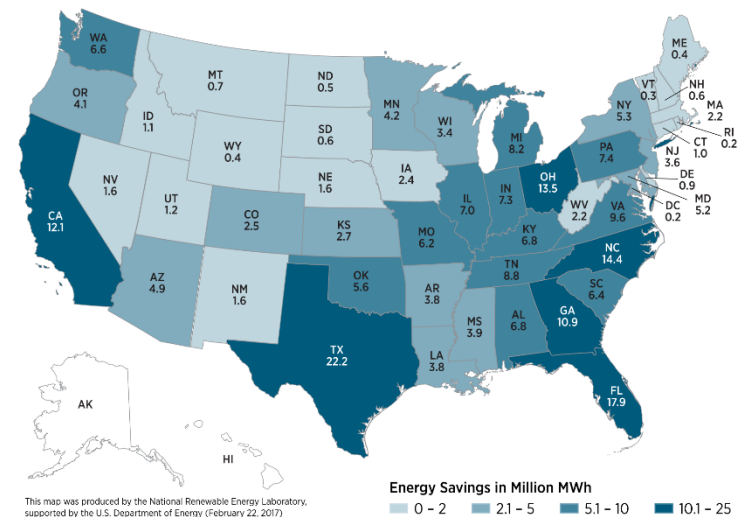
Estimated On-Site Technical Potential by State from **Combined Heat and Power (CHP)** (MW)



Estimated Achievable Potential Total Energy Savings by State (2010-2040) from **Building Energy Codes** (Trillion Btu)



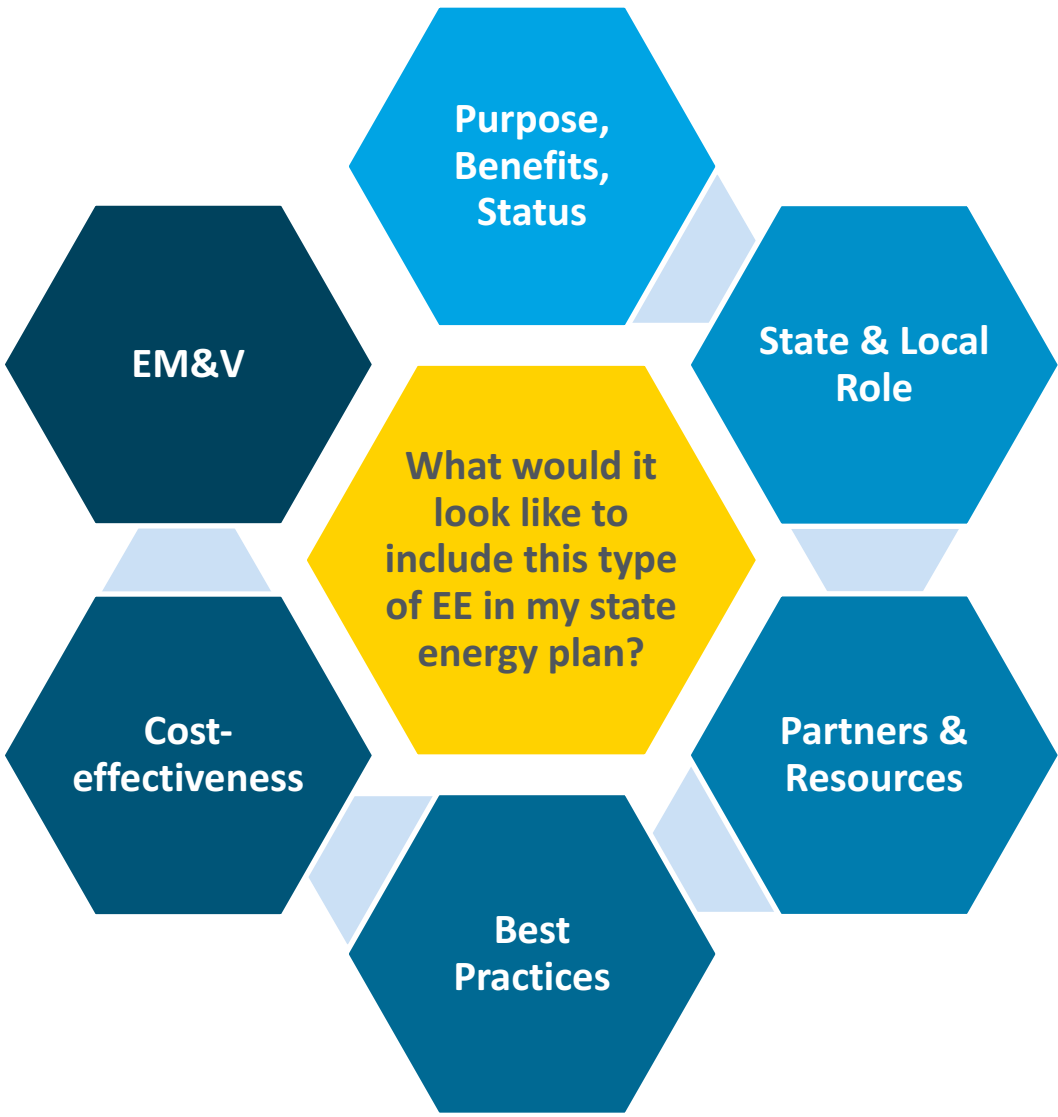
Estimated Economic Electricity Potential by State (2030) from **Residential EE** (million MWh)



This map was produced by the National Renewable Energy Laboratory, supported by the U.S. Department of Energy (February 22, 2017)



# Wide Range of Existing Resources & Partnerships Available



Learn how to access your state's EE potential or use as a starting point for familiarizing stakeholders

- [How energy efficiency programs can support state energy planning \(2017\)](#)
- [Building energy codes \(2017\)](#)
- [City-led energy efficiency \(2016\)](#)
- [Combined heat and power \(2017\)](#)
- [Energy savings performance contracting \(2016\)](#)
- [Industrial energy efficiency \(2017\)](#)
- [Ratepayer-funded energy efficiency \(2017\)](#)

# STANDARDS SAVE *BIG*

Over **65** covered products

**90%** of residential energy use covered

**60%** of commercial energy use covered

**30%** of industrial energy use covered

**43** Final Rules Issued

Includes a variety of products and Federal Building Codes.

**\$543** billion

The cumulative utility bill savings to **consumers** from standards issued since January 2009 are estimated to be \$543 billion through 2030.

**2.3** billion metric tons

The cumulative carbon emissions savings through 2030 – equivalent to the emissions of 520 million passenger cars in one year.

Consumer



Commercial and Industrial



Lighting

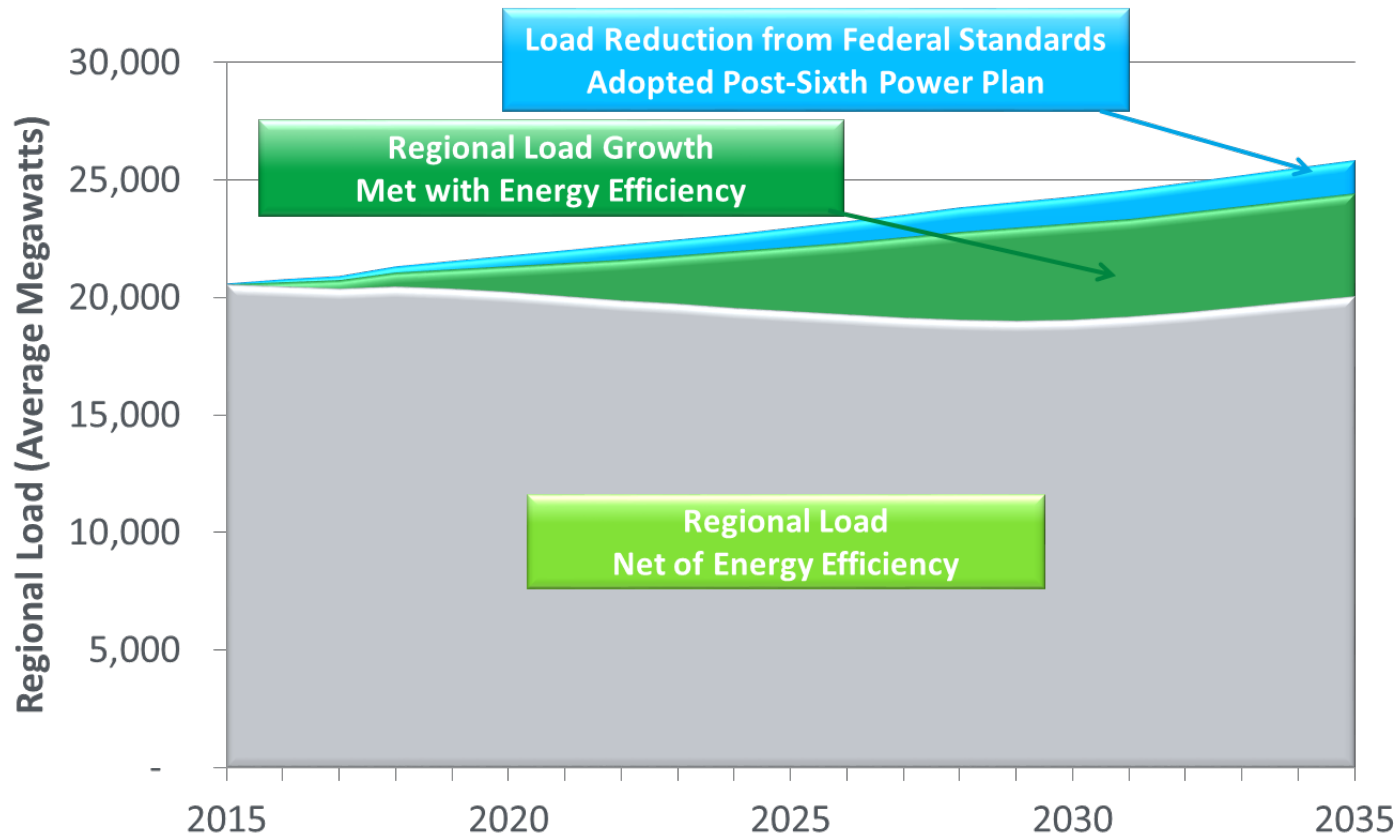


Plumbing



# Federal Standards, Energy Efficiency, and Regional Planning

Forecast Load Growth Over The Next Two Decades  
(Average Over 800 Futures)



NPCC's Seventh Northwest Conservation and Electric Power Plan, February 2016



Developing Innovative, Replicable Solutions with Market Leaders

- ▶ Better Buildings Challenge
- ▶ Better Buildings Alliance
- ▶ Better Buildings, Better Plants
- ▶ Better Buildings Accelerators
- ▶ Better Buildings Residential
- ▶ Strategic Energy Management



State, Local, and Federal Governments Leading by Example

- ▶ Better Communities Alliance
- ▶ Performance Contracting



Making Energy Efficiency Investment Easier

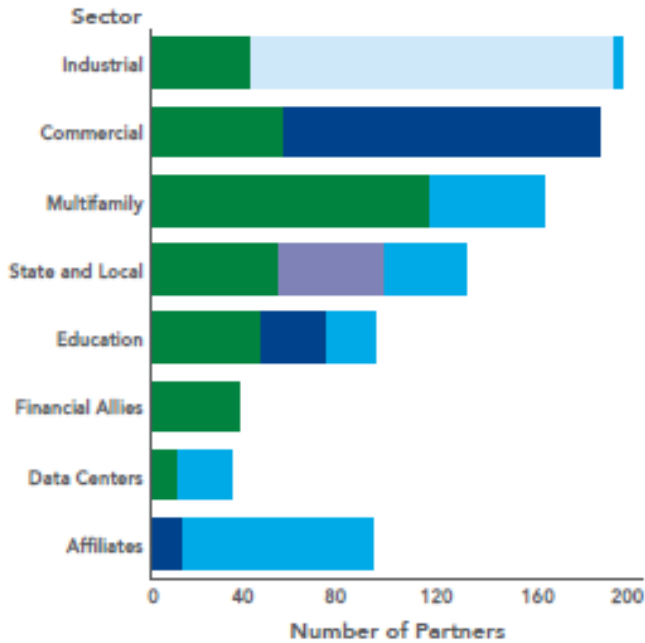
- ▶ Better Buildings Solution Center
- ▶ Financing Navigator
- ▶ Improved Data Consistency and Access
- ▶ Tools to Assess the Efficiency of Buildings/Homes
- ▶ Tools for Energy Management



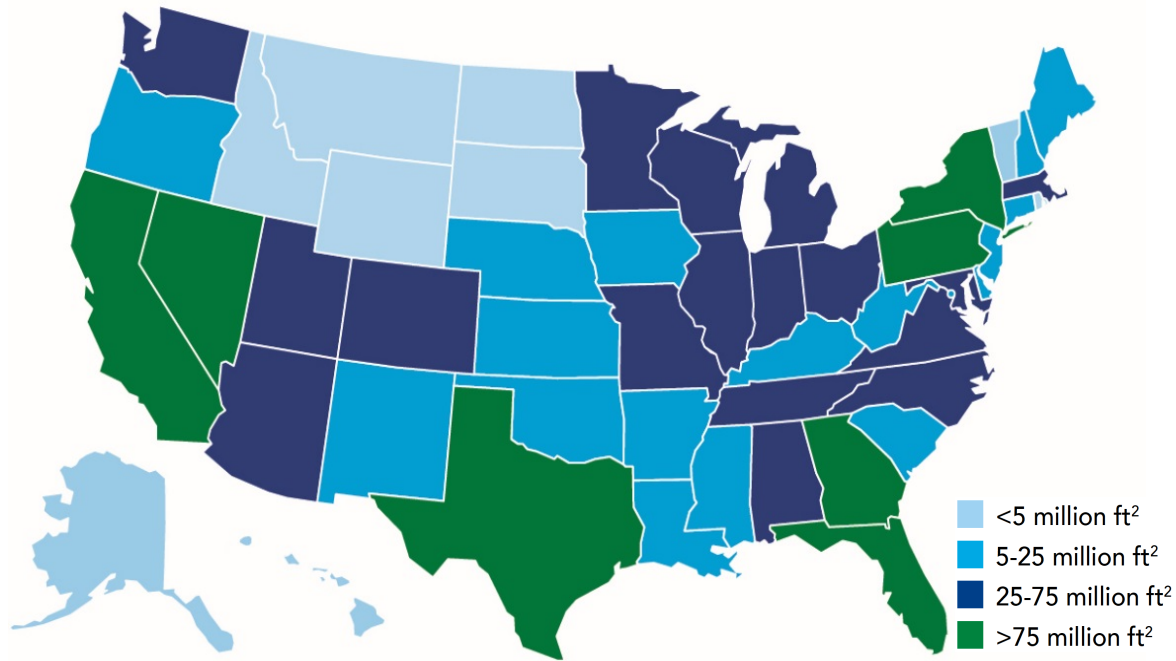
Expanding the Workforce

- ▶ Better Buildings Workforce Guidelines
- ▶ Industrial Energy Management Workforce

## Better Buildings Partners Connected Across the Marketplace



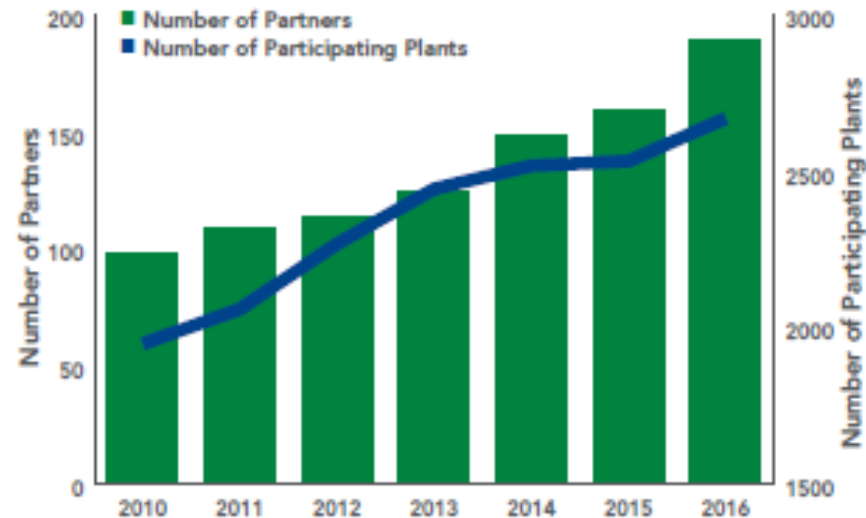
## Better Buildings Challenge Participation Across the Nation



# Better Buildings, Better Plants

- Better Plants:
  - Organizations set long-term goals (25% energy intensity improvement over 10 years)
  - Receive technical assistance, national recognition & networking opportunities
  - Gain DOE recognition for success

Better Plants Growth by Year



[energy.gov/betterplants](http://energy.gov/betterplants)

# Better Buildings: Results to Date

**\$1.9 Billion** saved

**\$7 Billion** in financing committed

**240 Trillion** BTUs of energy saved

**4.4 Billion** square footage covered

**4 Billion** gallons in water saved

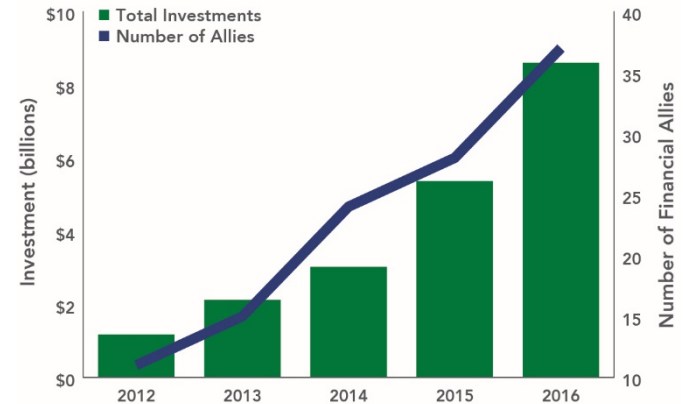
**900+** Better Buildings Partners

**1000+** solutions publically available in the  
Better Buildings Solution Center

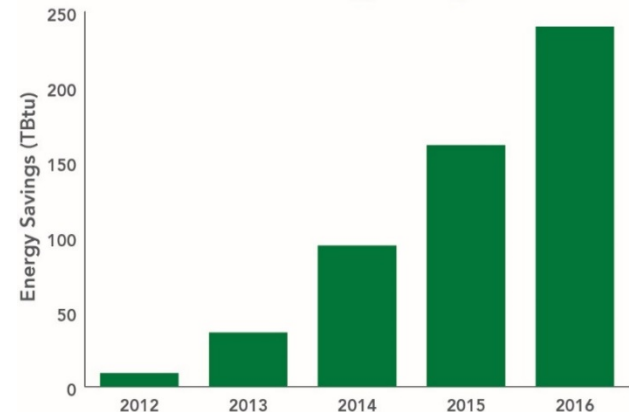


<https://betterbuildingsolutioncenter.energy.gov>

**Total Investment and Ally Growth by Year**



**Cumulative Energy Savings**



# Better Buildings Challenge SWAP



## Widespread Outreach



**2.1 Million VIDEO VIEWS**



**14 Million IMPRESSIONS**



**74+ Million UNIQUE MEDIA HITS**

## Reaching Media, Making Headlines

Can a Reality TV Show Help  
Cut America's Power Bill?

**Bloomberg**

2/17/2016

The Department of Energy's Efficiency-  
Based Reality Show is Great TV

**FSTCOMPANY**

11/30/2016





# ISO 50001 Focus

## An EnMS (Energy Management System)

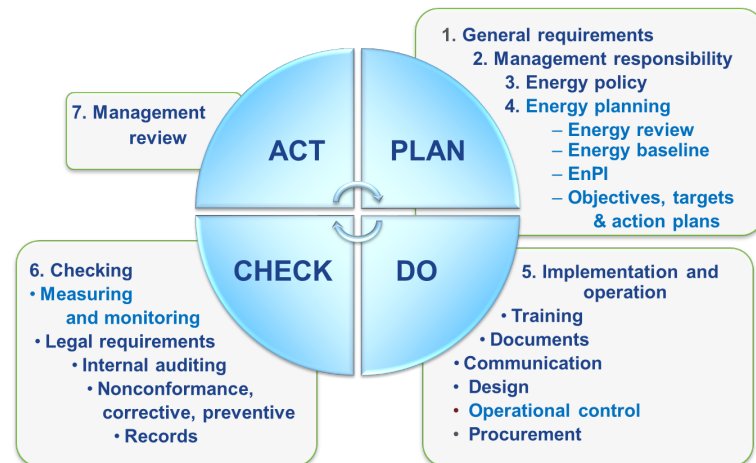
- Develop a consistent and lasting ‘practice’ around managing energy that also engages the ‘C’ Suite

## For all sectors

- In United States, industrials, commercial, military and institutional facilities are pursuing

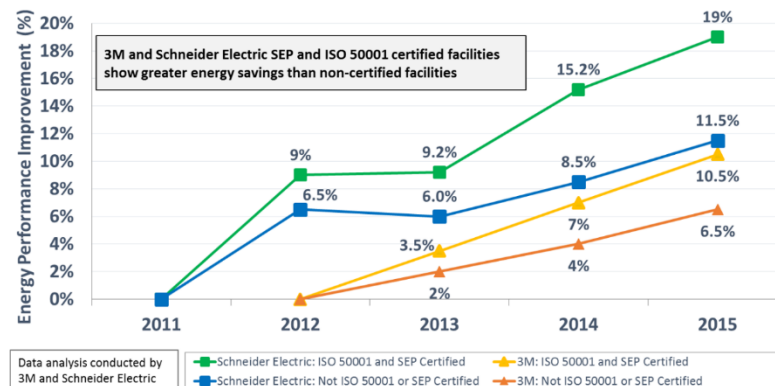


Hilton Worldwide has become the first hospitality company to have hotels certified to the DOE’s Superior Energy Performance. *Photos courtesy of Hilton.*



## Can lead to greater energy savings

- US DOE analysis with Schneider Electric and 3M find additional saving with ISO 50001 vs BAU energy mgmt



# U.S. Market Options for ISO 50001 Uptake

DOE builds market to prepare companies for gradual progression towards ISO 50001 certifications



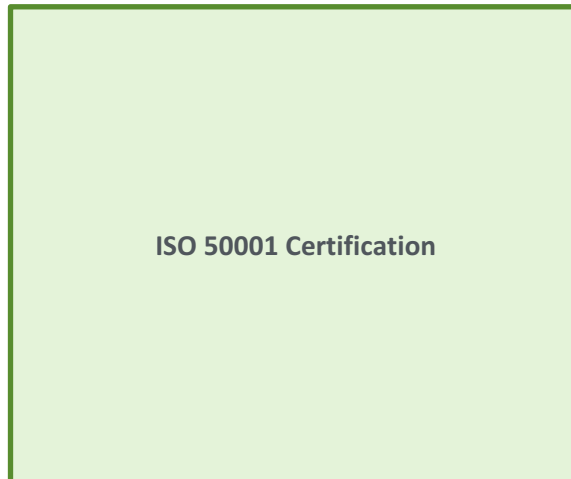
DOE's Superior Energy Performance program fills gap in the market for verified energy performance improvements from ISO 50001 implementation



DOE works to boost market availability of qualified organizations and competent professionals to provide accredited certification to ISO 50001

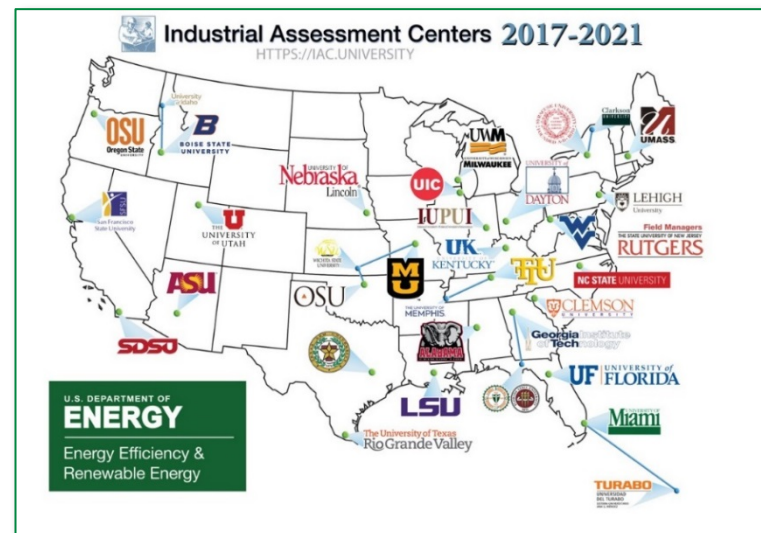
DOE's 50001 Ready self-attestation program prepares organizations for certification

Recognition for implementation of an ISO 50001-based energy management system using the guidance in the DOE 50001 Ready Navigator tool



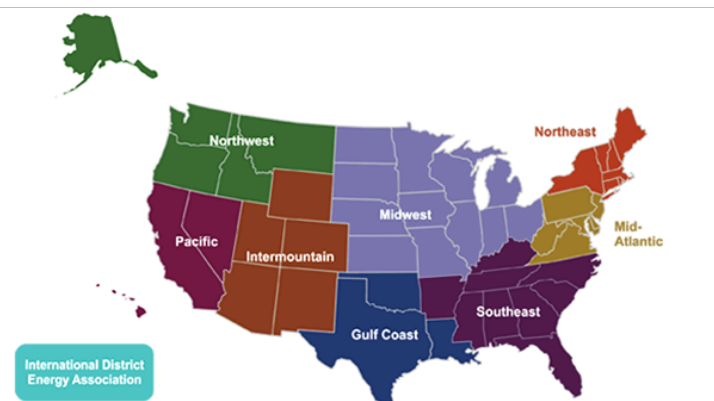
# Industrial Assessment Centers and CHP TAPs

- IAC program
  - Identifies energy saving and productivity improvements for small and medium-sized manufacturers
  - Provides hands-on assessment experience to engineering students on top of traditional learning
  - Advances *Energy Engineering* curriculum at host universities
  - Saves an IAC client more than \$47,000 in energy savings, productivity enhancements, and water use / waste reduction per assessment in one year
- CHP TAPs
  - Provide technical assessments and feasibility analyses



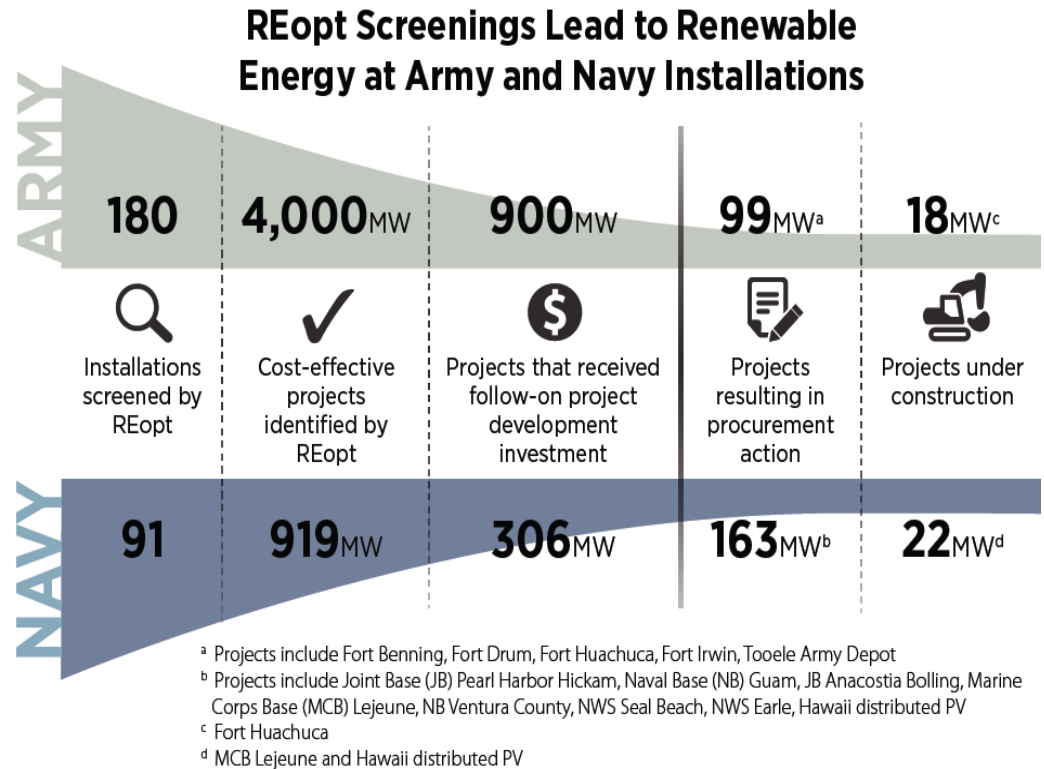
[energy.gov/IAC](https://energy.gov/IAC)

## Efficient On-Site Energy CHP Technical Assistance Partnerships



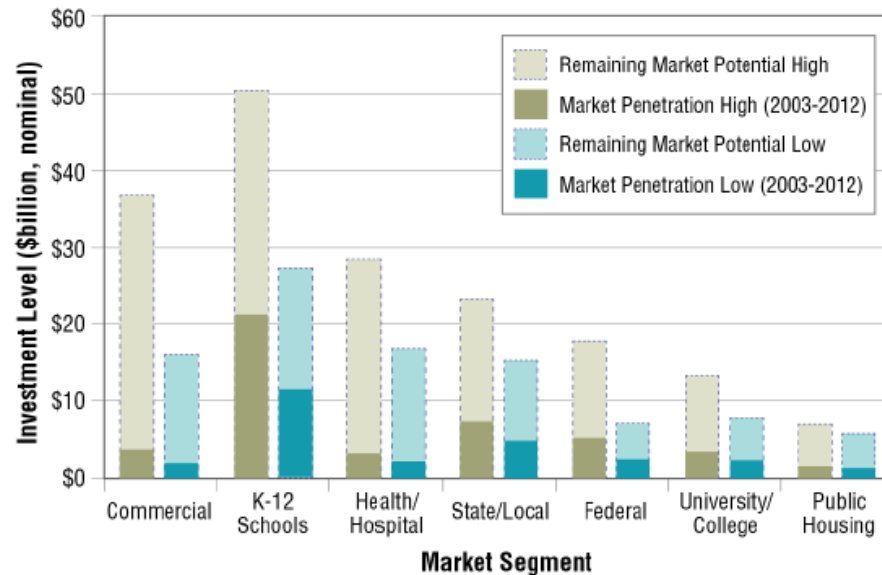
# Renewable Energy Project Assistance

- Federal Energy Management Program resources that can be used for state energy planning and project implementation.
- NREL's REopt energy planning platform -- quickly and efficiently screen and prioritize potential RE opportunities at a single site or across a wide portfolio of sites.



- For FEMP RE project assistance: <https://energy.gov/eere/femp/federal-renewable-energy-project-assistance>
- To learn more about NREL's REopt: [http://www.nrel.gov/tech\\_deployment/tools\\_reopt.html](http://www.nrel.gov/tech_deployment/tools_reopt.html)

# Performance Contracting Support



<https://eprojectbuilder.lbl.gov/home/#/about>

- **Providing Free** web-based system for uploading and tracking ESPC project and M&V data that:
  - **Standardizes project data** collection across market sectors, ESCOs and U.S. regions
  - Enables **robust analysis** of project and portfolio performance
  - **Empowers agencies and Preserves data** for agencies through contract term and beyond
  - **Encourages transparency** and ESCO accountability and **Reduces transaction costs**
  - Contains 480 projects (382 federal; 98 state/local); total project implementation costs of ~\$4 billion and total cumulative guaranteed \$ savings of ~\$10 billion
- **Use required** under new U.S. DOE-IDIQ contract and for some state ESPC programs
- **New submission platform** for NAESCO national accreditation and FEMP Qualified List of ESCOs

# Workforce Development

The Federal Energy Management Program (FEMP) provides workforce development services to foster and maintain a high-performance workforce to construct, operate, and maintain facilities in an energy-efficient and cost-effective manner. These are open, accredited, and FREE to all.

## FEMP Workforce Development Support

Federal Workforce Training Services

Federal Workforce Enhancement

On-Demand e-Courses\*

Live Webinars Series

Regional Onsite Workshops\*

Energy Exchange\*

FEMP Awards

Veterans Intern Program

\*Includes courses offering Continuing Education Units (CEU) by International Association for Continuing Education and Training (IACET)



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

# State and Local Outreach

- **State and Local Solution Center**
  - 6,000+ views per month
  - More than 300 tools, resources, and best practices covering topics like energy planning, infrastructure, financing, and data
  - **NEW!** *Energy Efficiency and Renewable Energy Resources for State and Local Leaders*

[energy.gov/eere/slsc/EERResources](http://energy.gov/eere/slsc/EERResources)

- **State and Local Spotlight**
  - Monthly update with ~8,000 subscribers

**Subscribe:**  
<http://energy.gov/eere/slsc>  
**or Email Us:**  
[stateandlocal@ee.doe.gov](mailto:stateandlocal@ee.doe.gov)



**ENERGY.GOV**  
Office of Energy Efficiency & Renewable Energy

**State & Local Spotlight** April 2017

Energy Efficiency and Renewable Energy News and Events for State and Local Leaders

A monthly update from EERE's Weatherization and Intergovernmental Programs Office (WIP) for state, local, and K-12 officials featuring resources to advance successful, high-impact, and long-lasting energy efficiency and renewable energy partnerships, programs, and projects.

**State & Local News**  
**New Mississippi Implementation Model Showcases Building Performance Strategies and Energy Efficiency Projects**  
Mississippi will see a 15% reduction in electricity consumption and 18% natural gas savings in Institutes of Higher Learning (IHL) by 2020. With support from a State Energy Program Competitive Award, the Mississippi Development Authority launched an effort to develop a strategy for assessing the performance of buildings and prioritizing

**Featured Publication**  
**Kentucky Energy Program's Strategies for Significant Energy Savings**  
Kentucky's Stimulating Energy Efficiency Action program is opening the door for big energy

# 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

- Saving Energy in Industrial Companies
- Guide for States: Technical Reference Manuals for Energy Efficiency Measures

### Coming Soon

- Energy Efficiency Financing for Low- and Moderate-Income Households: Current State of the Market, Issues, and Opportunities



Sign up for news alerts  
[www.seeaction.energy.gov](http://www.seeaction.energy.gov)





# Technical Support to States

## Delivered Support

State/Agency	Support Topics
MS PSC	<ul style="list-style-type: none"><li>• EM&amp;V best practices</li></ul>
CT Green Bank	<ul style="list-style-type: none"><li>• Improving access to energy use data</li><li>• Building labeling</li><li>• Lead-By-Example</li><li>• EM&amp;V best practices</li></ul>
CA Treasury	<ul style="list-style-type: none"><li>• Comparative assessment of financing programs</li><li>• Evaluating financing programs under regulatory framework</li></ul>

Contact Johanna Zetterberg with requests for technical support

[Johanna.Zetterberg@ee.doe.gov](mailto:Johanna.Zetterberg@ee.doe.gov)

## Hot Topics

- Code choices
- CHP policies
- On-bill financing approaches
- Industrial program design
- Public/commercial building benchmarking
- EM&V methods and EE program impacts
- Financing - low income consumer protections
- Integrated Resource Planning
- EE targets and goals
- EE stakeholder collaborative design
- Behavior-based programs
- Bill impacts of EE programs