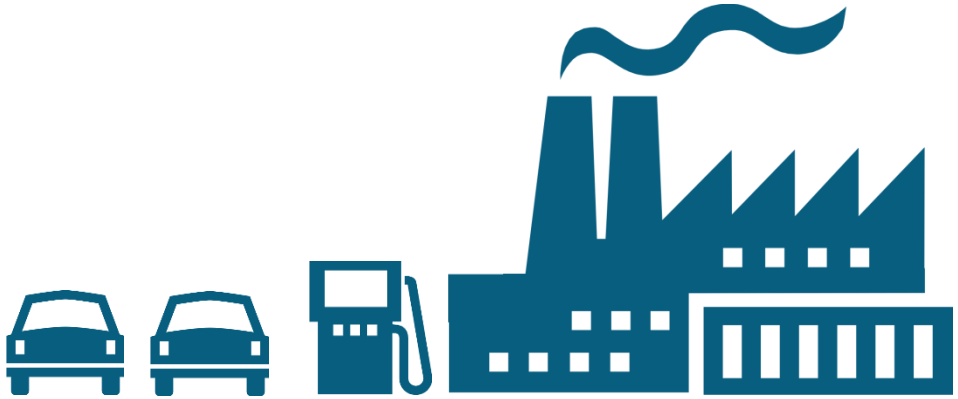
Building Technologies Office

Roland Risser
Director, Building Technologies Office

National Energy Consumption

40%

60%



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


Reducing consumption or improving performance calls for
cutting-edge
energy-efficient
solutions

Aiming High for 2030

Double U.S. energy productivity

Lower building energy use by 50%

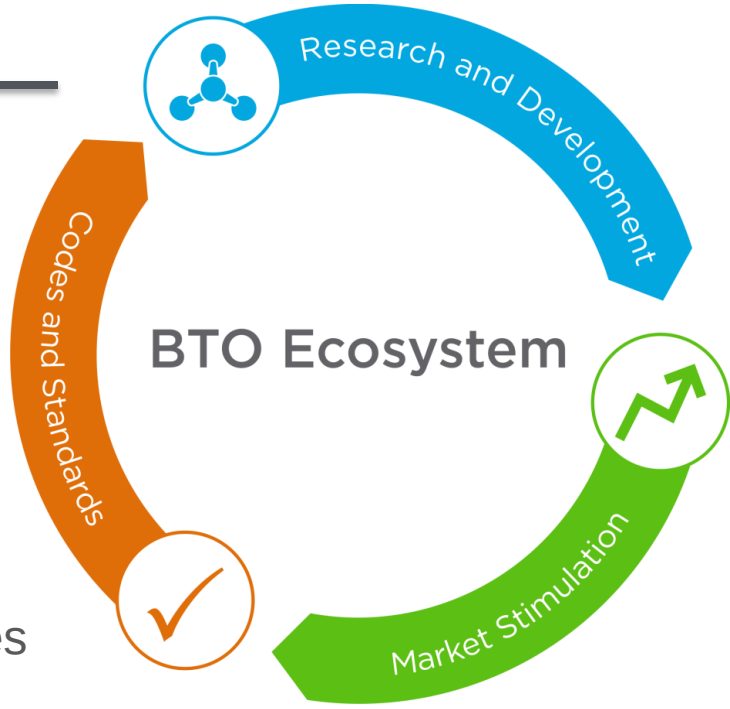
- Annual energy use by 20 quads
- 1 billion metric tons CO_2
- $200 billion

for America's

homes and **buildings**

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

Delivering Energy-Efficient Solutions



Emerging Technologies

- High-impact building technologies
- ~Five years to market-ready

Residential Building Integration

- Cost-effective technologies, tools, solutions
- Peak energy performance in new & existing homes

Commercial Building Integration

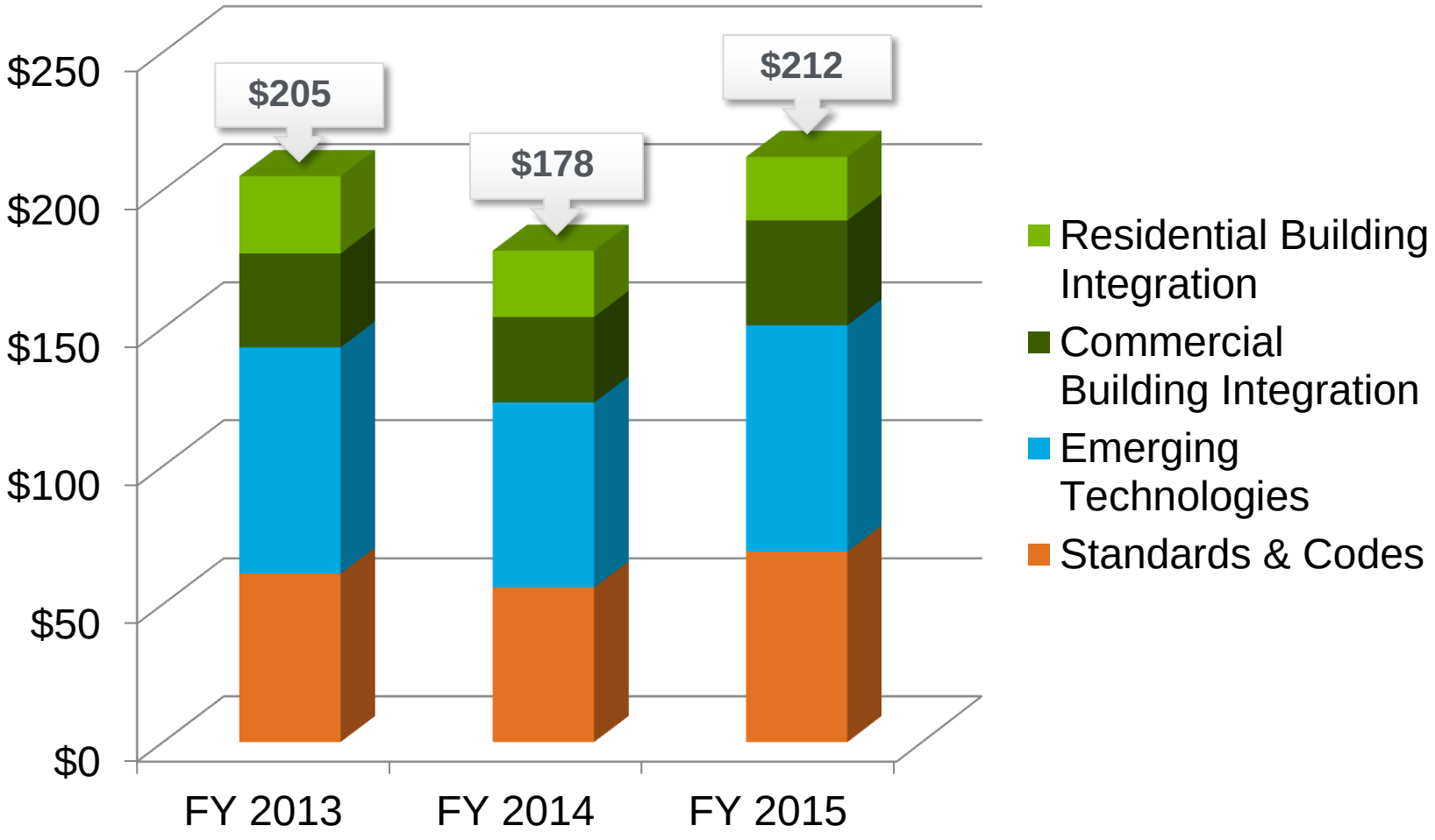
- Cost-effective technologies, tools, solutions
- Peak energy performance in new & existing commercial buildings

Codes & Standards

- Building energy code language with adoption/compliance strategy
- National appliance & equipment standards

BTO Funding by Program

(in millions)




Research and Development
Drive
Innovation
U.S. DEPARTMENT OF
ENERGY
Energy Efficiency &
Renewable Energy

R&D Emerging Technologies

Opportunity

Develop **high-impact technologies** with **50%** energy savings

Strategy

Identify high-impact technologies with the **Prioritization Tool** **&** **Fund R&D** through competitive solicitations and support National Lab technical capabilities

65%

34%

24%

Potential - Energy - Savings

39%

37%

18%


Market Simulation
Accelerate to Scale

Market Stimulation Residential Buildings

Opportunity: Existing Homes

50% energy reduction via **retrofits**

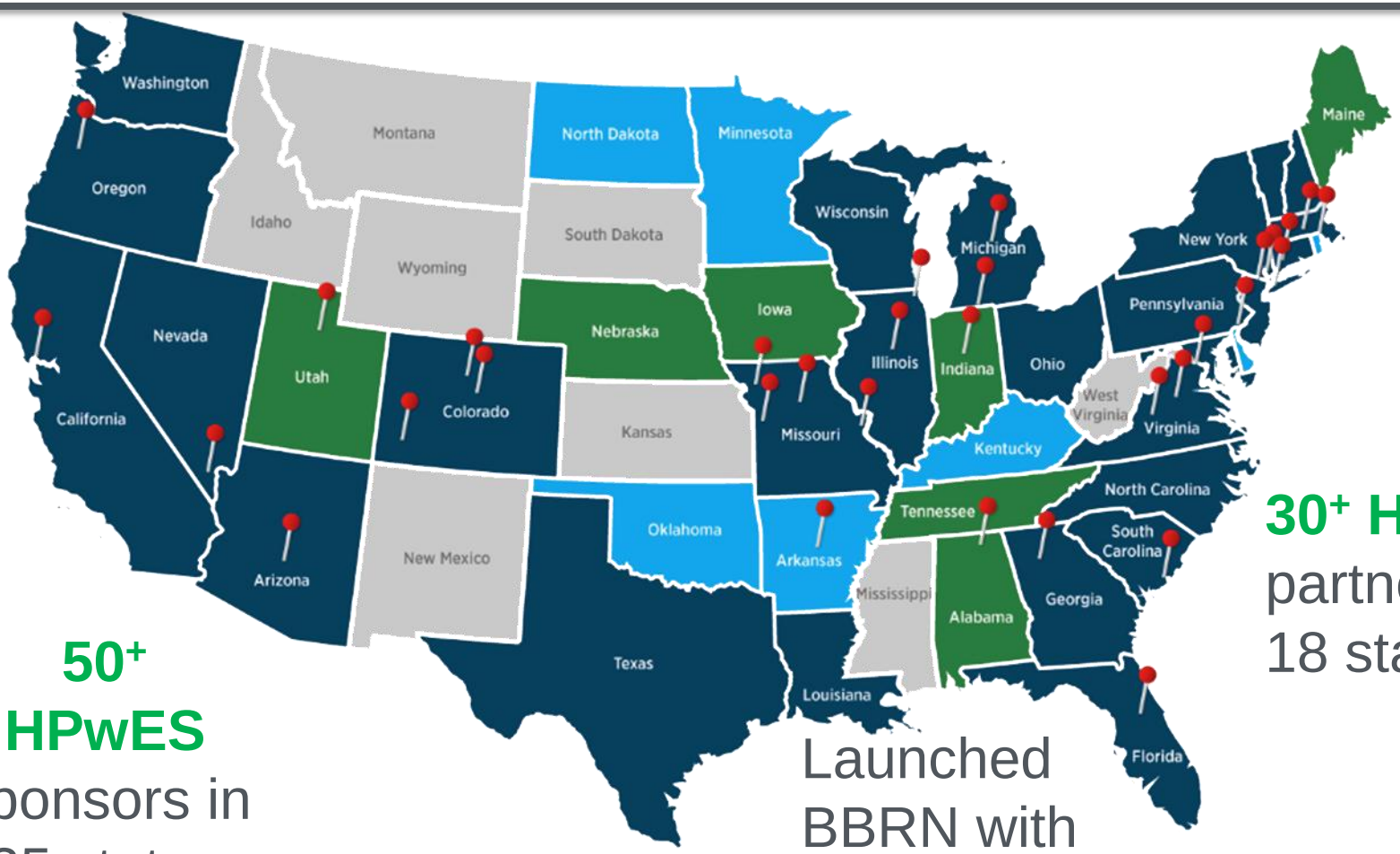
Opportunity: New Homes

50% energy reduction, **Zero-Energy Ready**

Strategy

- **Demonstrate** technologies to spur integrated solutions
- **Deploy** standardized data tools to assess performance, show value
- **Develop** guides to inform construction industry

Better Buildings Residential *Nationwide*



50+ HPwES sponsors in 35 states

Launched BBRN with **60+** members

30+ HES partners in 18 states

Better Buildings Neighborhood Program Partner & Home Performance with ENERGY STAR Program Sponsor

Better Buildings Neighborhood Program Partner

Home Performance with ENERGY STAR Program Sponsor

Home Energy Score Partner

Better Buildings

HOME PERFORMANCE WITH ENERGY STAR

Better Buildings

HOME PERFORMANCE WITH ENERGY STAR

U.S. DEPARTMENT OF ENERGY Home Energy Score

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

Market Stimulation Commercial Buildings

Opportunity: Existing Buildings

50% energy reduction

Opportunity: New Construction

50% energy reduction, **Zero-Energy Ready**

Strategy

- **Demonstrate** cost-effective & high-impact technologies & solutions
- **Deploy** tools & solutions through partnerships with building owners & operators
- **Develop** tools to
  - Influence decision making
  - Inform policy & program design
  - Demonstrate economic & environmental benefits of energy efficiency

Commercial Buildings Adv. Rooftop Unit Campaign

The Challenge

Widespread market adoption of highly efficient RTUs

Demonstrate/Deploy

Meet specifications

Reap Rewards

Save up to **50%** on energy costs

If Energy Efficient RTUs replaced all 10-20 ton commercial units, businesses would save $1 billion/year on energy

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Market Stimulation Digital Tools & Solutions

Data Sources

- Basic Building Info
- Energy Consumption
- Audits
- Commissioning studies
- Operating characteristics
- Equipment & asset info
- Public records

Tools & Databases

ENERGY STAR® Portfolio Manager®

Home Energy Score

Comm. Building Energy Asset Tool

Other Tools

Aggregation Platforms

SEED Platform

DOE BUILDINGS PERFORMANCE DATABASE

Data on 745k real buildings

BA Solution Center

1.25 million users

EnergyPlus


Codes and Standards
Lock-In Savings

Appliance & Equipment Standards

Opportunity

By issuing 12 final rules establishing new or updated energy conservation standards by the end of FY15, **BTO could deliver energy savings of 9 quads total by 2030**.

Strategy

- Increase the # of covered **products**
- Enhance product **test** procedures
- Employ **consensus** process
- Accelerate **rulemaking** schedule
- Enforce manufacturer **compliance**

All standards currently in effect stand to save…

	Cumulative by 2030
Energy	Total energy savings of 124 quads
Environment	Total CO_2 savings of 6.7 billion metric tons
Consumer	Total savings of $1.7 trillion

Building Energy Codes

Opportunity

With continued BTO efforts on the development, adoption, & compliance of the national model energy code, by 2030 the nation can achieve annual savings of: **1.26 quads of energy, $7 billion, and 94.5 MMT CO_2.**

Strategy

- Code changes analysis
- State adoption assistance
- Cost & energy savings analysis
- Compliance software

Codes Cumulative Impact from 2013 Baseline

	By 2030
Energy	Total energy savings of 12.3 quads
Environment	Total CO_2 savings of 871.1 million metric tons
Consumer	Total savings of $125.7 billion

BTO Ecosystem at Work

	Yesterday	Today	Tomorrow
Research & Development			
Market Stimulation	 Limited Delivery	 Tools & Programs	 Market Transformation
Codes & Standards	 No Codes	 IECC 2009/12	 90% Compliance

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BTO Operational Focus Areas

Logic Models

Define

Goals
Approach to work
Evaluation methods

Multi-Year Program Plans

Plan

A roadmap of program milestones

Impact Assessments

Assess

The impact of select programs

BTO Logic Model

The Chain of Logic:
How does what we produce affect the market?

Goal

- By 2020, develop HVAC technologies enabling 12% savings based on their maximum-adoption potential

Output

- Products and components ready for commercialization that meet the cost and performance targets identified in the technology roadmaps

Outcomes

- Products and components are produced and commercialized by manufactures
- Consumers and businesses purchase energy efficient HVAC equipment

Impact

- Primary energy usage due to HVAC equipment is less than would have been in the absence of the BTO HVAC program

Multi-Year Program Plan

Five Year Program Plans

2030

Reduce building energy use by 50%

Evaluation and Impact Assessment

Release RFP for Third-Party Evaluation before end of FY14

Evaluate the impact of select programs/activities

✓ Assessments complete in late FY15

BTO 2014 Peer Review

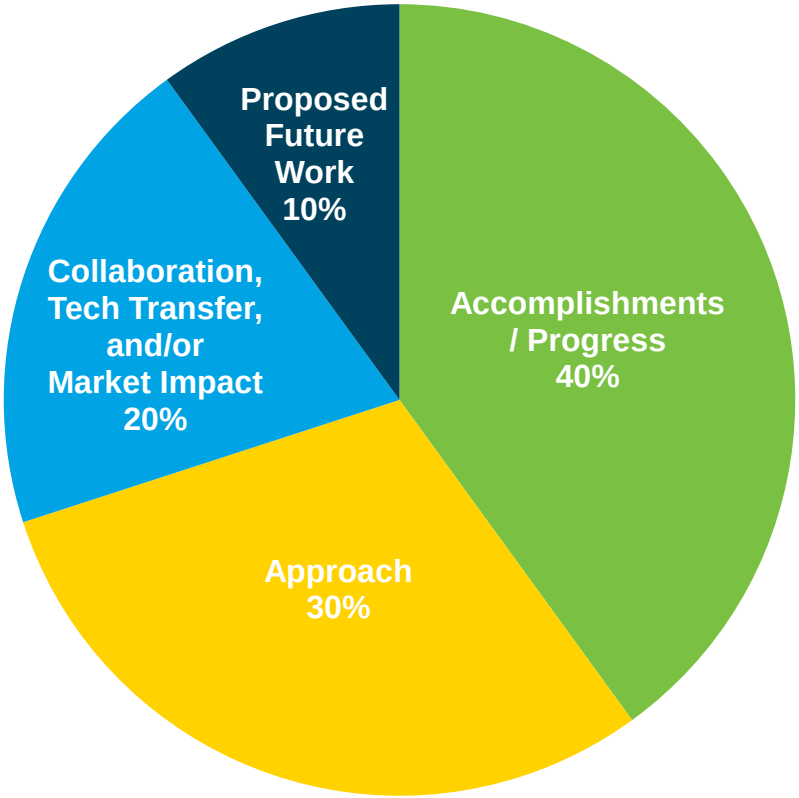
Evaluate project performance

✓ Incorporate feed back into FY 15 planning

FY 2014 Peer Review

Review Scope

- Communicate BTO program activities and their connections, highlighting: what we do; transparency; progress being made with taxpayer dollars
- Objectively evaluate select BTO projects



- Provide a forum that promotes the creation of collaborations and partnerships.
- Demonstrate DOE leadership in energy efficiency.

THANK YOU

to our reviewers & participants!

Your feedback is welcome. Please fill out the provided surveys.

Surveys are not just for reviewers – they are for all participants.