Building Energy Codes Program (BECP)

An Overview of the Codes Program

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

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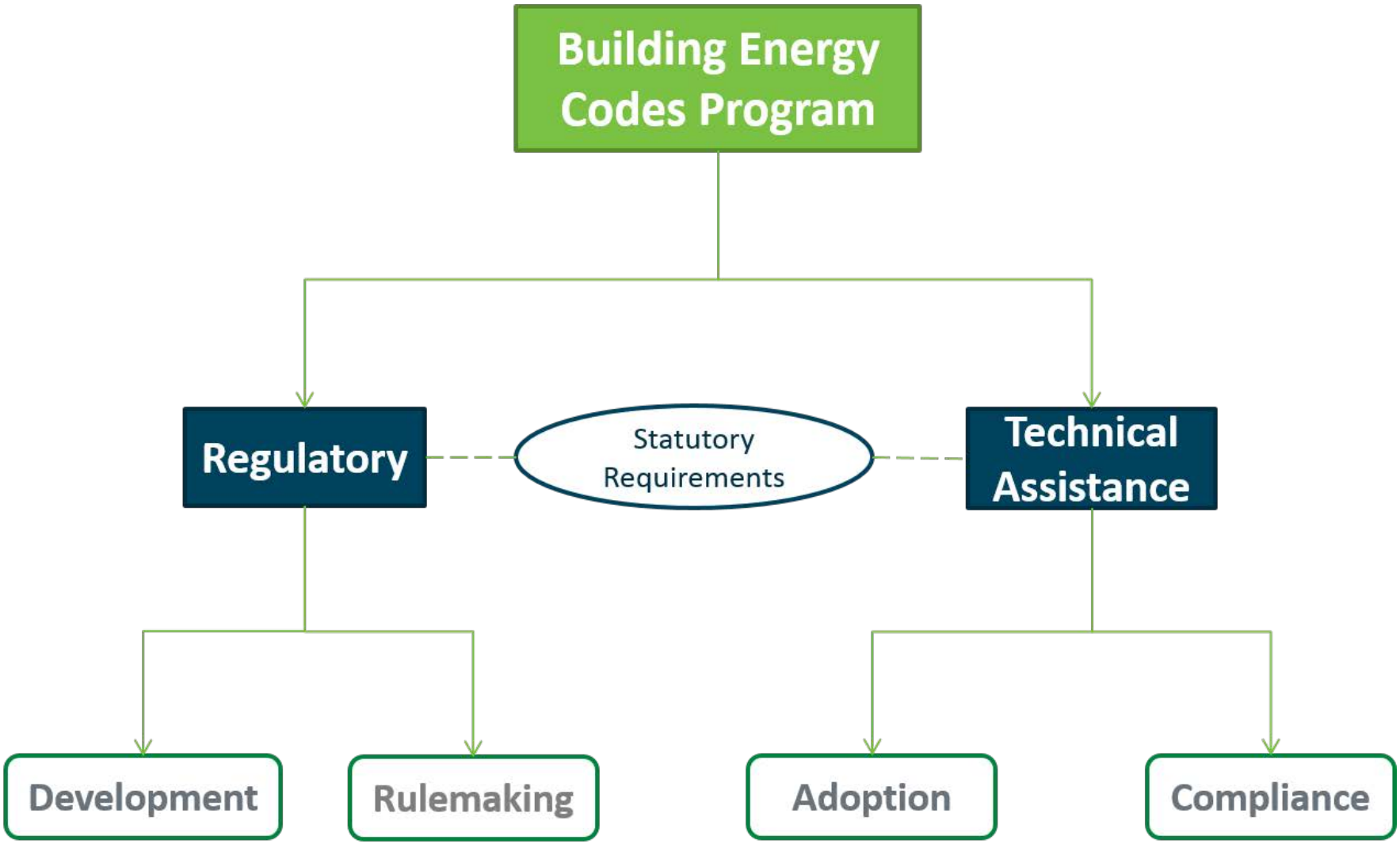
Context within BTO

- Within the BTO Ecosystem, energy codes follow emerging technologies and deployment programs to lock in energy savings and set minimum efficiency levels which drives further technology innovation by companies wishing to differentiate themselves in the market.

- BECP's mission is to support U.S. building energy codes and standards development, adoption, implementation, and enforcement processes to achieve the maximum practicable improvements in energy efficiency while providing safe and healthy buildings for occupants. Energy codes apply to residential and commercial new construction, additions and major renovations. The current program priority is measuring potential cost and energy savings associated with improved compliance.

BECP Structure



Budget

- FY 16 budget: $9.1M
- FY15 budget: $5.5M
- Major performers:
  - PNNL (≈$3M/yr)
  - Regional Energy Efficiency Organizations (≈$1.3M/yr).
- One or no FOAs are released each year.

Program Strategy

Key Barriers Being Addressed

- Belief that energy codes are not life/safety and therefore have lower priority or are “social engineering” and have no place in building codes.
- Resistance to increased code complexity by building officials, others
- Technical and economic risk (perceived and real) to builders
- Lack of resources at building departments

Target Audiences

- Building officials
- Design and construction professionals

Main Program Focus

- Providing technical support to states and conducting research to determine the magnitude of energy and cost savings opportunities

- Present Program Logic Model
- Discuss major elements highlighted in MYPP

The Building Energy Codes Program aims to "lock in" savings from energy codes by participating in code development processes and supporting local and state governments in the adoption and implementation of progressively more advanced building energy codes across the country.

Dec. 2015

External Influences: DOE budget, Construction industry, Real estate market, State/local policies & budget

Objectives	Activities / Partners	Outputs	Short Term Outcome	Mid-Term Outcome	Long Term Outcome
Support energy code development & improvement with analyses & stakeholder forums	Conduct market research, technical & economic analyses targeted at specific code opportunities & issues	Code proposals based on public reports on cost, reliability, savings and markets	ASHRAE & ICC equipped with analyses to update code for residential & commercial buildings	ASHRAE & ICC publish more advanced national model codes for buildings	New buildings are constructed in compliance with increasingly more aggressive energy efficiency requirements in building energy codes & ensure code-related savings.
	Sponsor forums for sharing info with code practitioners & other stakeholders	Technical & analytical support to ASHRAE 90.1	Industry stakeholders aware of energy code issues, benefits of more aggressive codes based on BECP analyses & leadership	Stakeholders (e.g., building, financial, real estate industries, utilities) begin to value energy efficiency in buildings	
Empower state & local governments to adopt more advanced energy codes	Develop location-specific analyses to quantify value of improved codes in support of states, localities, utilities, etc.	Annual conference & other forums for discussion on codes	State & municipalities have access to analyses to understand specific value of code adoption	State & municipalities adopt more advanced energy codes	
	Support REEOs to increase awareness of analyses & accelerate code adoption	Localized technical & economic reports on value proposition with more aggressive codes	State, municipalities, building officials are equipped with resources to aid in code implementation	Building professionals accept increased codes & properly build to more advanced codes	
Support code compliance with technical assistance & tools for state & local governments	Develop tools to help building professionals meet adopted codes	REScheck and COMcheck, software programs to help verify buildings meet code	Building officials & professionals aware of importance of code compliance	Building officials enforce code compliance & building professionals focus on it	
	Enable REEOs to support state & local governments in training & resources	Curricula, education materials, resource guides, technical assistance supported by REEOs & stakeholders like NASEO	Stakeholders like private investors & utilities, understand value proposition of advanced energy codes	Industry stakeholders provide funding to help measure & improve code compliance	
	Assess the value proposition of investment in code compliance	State-specific analyses & methodologies to measure cost & energy saving benefits of code-related compliance			

**REEOS are regional energy efficiency organizations.*

Impact

Provide analysis for model code development → Deliver localized analysis to state & local governments on code adoption → Offer technical assistance to support code compliance → Code jurisdictions use BECP resources for code adoption & enforcement leading to 40% EUI reduction in new construction by 2025 → Reduce EUI of new bldgs. 50% by 2030

Building Energy Codes Program Logic Model

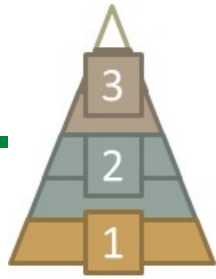
OBJECTIVE	ACTIVITIES	KEY OUTPUT	SHORT-TERM OUTCOME	MID-TERM OUTCOME	LONG-TERM OUTCOME
Support code development	Analyze new code opportunities	New code provisions proposed	Code orgs have analyses	Advanced codes published	New buildings meet or exceed regularly updated energy codes
	Create forums to share code information	Annual code conference & other forums	Code issues & benefits discussed		
Support code adoption	Analyze local impact of codes	Localized reports on new code value	Localities understand value	Advanced codes adopted	
	Fund awareness efforts				
Support code compliance	Support compliance, including tool development	Technical assistance	Compliance value understood & implemented	Compliance improved, funded & valued	
		Measurement methods			
	Assess value of compliance	RESCheck & COMCheck			

Updated Dec. 2015

EXTERNAL INFLUENCES

- DOE Budget
- Construction Industry
- Real Estate Market
- Legislation / Regulation
- State & Local Governments

Program Goals Flow Diagram



Level 1

Provide objective analysis for model code development

Deliver localized analysis to state and local governments on code adoption

Offer technical assistance to support code compliance

Level 2

BECP methods to determine energy savings from the adoption and compliance of building energy codes are used in jurisdictions responsible for more than 80% of construction.

By 2025, typical design and construction practices will lead to new buildings that use 40% less energy per square foot than comparable buildings built 2010.

ET

RBI & CBI

Stds.

Other

Level 3

Reduce EUI of buildings built after 2010 by 50% from 2010 levels

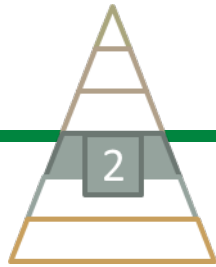
Annual
Program Performance

2020
Near Term Outcome

2025
Interim Outcome

2030
Market Outcome

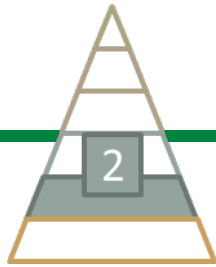
BECP's Interim Market Goal



By 2025, typical design and construction practices will lead to new buildings that use 40% less energy per square foot than comparable buildings built in 2010.

- Connections Between Interim Goal and Program Strategy
  - New construction (buildings built between 2010 and 2030) will represent well over 30% of the total floor area in 2030.
  - Designing and building these buildings to be more efficient will have a major effect on overall energy use.
  - BECP provides objective analysis during model code development and offers analysis and assistance to states in code adoption and compliance.

Details on Near Term Market Goals



Adoption

BECP methods to determine potential energy savings from the adoption and full compliance of building energy codes are used in jurisdictions representing more than 80% of construction.

Connections to Interim Market Goal:

- To be effective building codes must be adopted by states and localities.

Connections to Program Performance Goals:

- BECP provides objective analytically rigorous analysis to states regarding the impact of the adoption of code.
- We want to observe states and localities actually using this information in their code adoption processes.

Compliance

BECP methods to determine the actual level of code compliance are used in jurisdictions representing more than 50% of construction.

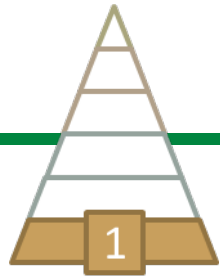
Connections to Interim Market Goal:

- Without assessing compliance we have no way of determining if codes are effective.
- Currently BECP is conducting residential field studies to determine savings opportunities from increased compliance. Similar work is planned for commercial starting in late 2016.

Connections to Program Performance Goals:

- BECP has developed an analytically sound approach for assessing the compliance of new construction.
- We want to see states using BECP's method for assessing compliance so we will have high confidence in the effectiveness of codes.

Program Performance Goals



Supporting model code development:

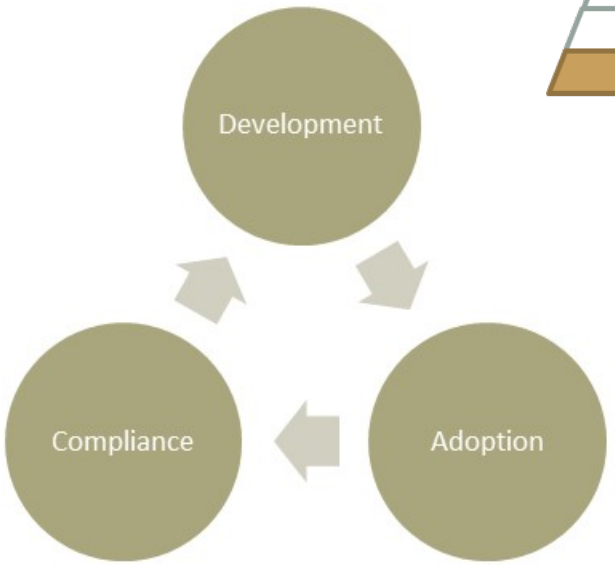
- Participate in model code development processes by submitting proposals in support of energy saving, cost-effective technologies and construction practices. Base all proposals on objective, transparent economic and technical analyses.

Accelerating model code adoption:

- Provide all states, utilities, and other key stakeholders with analyses demonstrating energy savings and cost effectiveness of new model codes.

Improving compliance with adopted codes:

- Provide states, utilities, and other key stakeholders with technical assistance, tools and training, and compliance materials aiding full implementation of recent model codes.



The Codes Cycle:

A continuous process, with new codes being developed every three years, state and local jurisdictions adopting codes periodically, and compliance assessments ideally occurring every 3-5 years.