How Should Energy Efficiency Program

How Should Energy Efficiency Program Savings be Credited in Jurisdictions with Building Performance Standards?

Steven Nadel, Executive Director Presentation at IEPEC Conference November 2022





New and Existing Buildings as Share of Building Floor Area (Residential + Commercial)



Source: ACEEE calculations based on data in EIA AEO 2020.



Mandatory Building Performance Standards

- Require covered buildings to meet specific energy consumption or carbon emission targets
- Typically several years are provided to meet targets
- Targets are generally tightened periodically



Current Retrofit Rates (approximate)

Residential: <0.2%/year (500+ years to retrofit all homes)



Commercial: 0.8-2.2%/year (using midpoint, 67 years to retrofit all buildings)





Potential Savings from BPS

Variable	Commercial	Residential	Total
Buildings energy use in 2050 (quads)	19.93	20.69	40.62
Buildings energy-related CO2 in 2050 (MMT)	742	775	1517
Proportion in 2050 that are pre-2020	44%	67%	
Proportion of pre-2020 stock covered	67%	67%	67%
Average reduction from performance standards	30%	30%	30%
2050 energy savings (quads)	1.76	2.79	4.55
2050 CO2 savings (MMT)	65.6	104.4	170.0

Total savings are 11% of projected 2050 buildings energy and CO2







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Building Performance Standards in the U.S.

		Compliance Year		
Jurisdiction	Adoption	Largest Buildings	Smallest Covered Buildings	
Boulder, CO	2010	2019	2019 (no size limit)	
Reno, NV*	2019	2026	2032 (down to 30,000 sf)	
Washington, DC	2019	2026	2031 (down to 10,000 sf)	
New York City	2019	2024	2024 (down to 25,000 sf)	
Washington State	2019	2026	2028 (down to 50,000 sf)	
St. Louis	2020	2025	2025 (down to 50,000 sf)	
Colorado	2021	2026	2026 (down to 50,000 sf)	
Boston	2021	2025	2030 (down to 20,000 sf)	
Denver	2021	2024	2024 (down to 25,000 sf)	
Chula Vista, CA**	2021	2023 & 2028	2026 & 2031 (down to 20,000 sf)	
Maryland	2022	2030	2030 (down to 35,000 sf)	
Montgomery Cnty MD	2022	2024	2027 (down to 25,000 sf)	



This Paper

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Energy Efficiency Implementor Role in Adoption of BPS



- In general, the program implementers provided input on the legislation based on their expertise and experience.
- Program implementers generally did not actively support the standards -- did not want to get ahead of their customers.
- Program implementers were generally "comfortable" with what passed.
- In two instances, interviewees said that policy makers viewed the continued operation of utility energy efficiency programs as vital to helping building owners meet required targets.



Energy Efficiency Program Role Prior to BPS Effective Date



- All implementers plan to continue their programs, at least up to the time when the standards apply to a particular building.
- Many program implementers expressed interest in expanding their programs prior to the effective date, encouraging early compliance. – education, training, enhanced incentives.
- In one case (Washington State), the legislation specifically establishes a \$75 million incentive program for early compliance, administered by the state government, but with payments made by the state's utilities using funds provided by the state through a new tax deduction for utilities.
- In Cambridge, MA, city and utility set up a "concierge service" (TA and incentives) to help buildings now covered by the city's benchmarking law to improve their energy efficiency. Covered by utility energy efficiency budget.



Energy Efficiency Program Role Following BPS Effective Date

- Broad agreement that energy efficiency programs have an important role to play in supporting implementation after BPS take effect:
 - Technical Assistance
 - Workforce Development
 - Incentives
- Several interviewees noted that building owners want robust financial support.
 - St. Louis city officials viewed the continuation of utility incentive programs as a necessary step to help building owners comply with the legislation.
 - Two people expressed the concern that the BPS might be rolled back if there is not financial support.
 - Suggested that incentives will be particularly needed for small/medium buildings.
 - Concern that incentive budgets might be exhausted in the year before the BPS takes effect, making it difficult for those who wait until the last minute to receive the assistance they need (likely to be less experienced with EE).



Developing and Applying a Baseline for Payment of Incentives



- In many (but not all) jurisdictions, if an efficiency measure is required by a building code or an equipment efficiency standard, it is considered baseline and not eligible for program incentives
- However, interviewees pointed out that BPS differ from building codes in a number of ways:
 - Policy makers in a few jurisdictions have explicitly set out an efficiency program role in BPS implementation.
 - BPS differ from codes in that building owners have many options to meet standards and have the option of paying noncompliance penalties. Depending on penalty amounts, noncompliance could be widespread. Program incentives will save energy and reduce emissions by helping to upgrade buildings that otherwise would have incurred penalties.
 - Building owners have options to meet the BPS, including not just efficiency measures but also other options such as solar, combined heat and power systems, or electrification. Efficiency programs can assist customers in choosing the best options
- Baselines might vary by type and size of building.
- Baselines can be set at various levels, ranging from current condition is the baseline to assuming the BPS targets as baseline. There are also intermediate options.



Net to Gross Ratios

- A common way to estimate net savings is to first estimate gross savings and then apply a net-to-gross ratio.
- For example, the New York (State) Public Service Commission (NYPSC) decided that for the purpose of estimating net effects and reporting net savings, for most programs, 90% of the gross savings can be counted and 10% are considered "free riders". This approach is simple to understand and implement. Several NY interviewees liked this general approach
 - In NY, there are a few exceptions where free riders are assumed to be zero, such as for low- and moderate-income housing and for a pilot pay-for-performance program.
- In Missouri's utility energy efficiency programs, the number of free riders that are excluded from savings are estimated based on retrospective surveys of program participants. After the BPS takes effect, the evaluation can also ask questions about BPS requirements and penalties to estimate free ridership.
- A common hybrid approach is to do retrospective evaluations and use those to set prospective estimates that will be used in future years, until a new retrospective evaluation is available to set new prospective guidelines.
- Municipal utilities may have their own rules.



A Possible Alternative: Use Gross Savings

- Most discussion on various approaches for estimating net savings, accounting for free ridership.
- Another approach is to count all savings, without considering free riders.
- Gross savings are higher and this should be considered in setting savings targets.
- A few of the program implementers really liked this approach, saying it would be easier to implement without trying to measure free ridership.
- Some program implementers thought their regulators would be unlikely to accept such an approach.
- And some were concerned about increasing program energy savings goals, even if the savings were gross savings, worrying that the new goals would be too ambitious.



Incentives for Improvements that Exceed BPS Requirements



- Not all buildings are subject to BPS requirements, including smaller buildings in the early years of BPS compliance, and excluded buildings, such as those subject to rent control in NYC and federal buildings in DC.
- Furthermore, efficiency programs can offer packages that help owners to exceed BPS requirements.
 - E.g., in Seattle, the utility continues to offer incentives for retrocommissioning existing buildings, as these services go well beyond building tune-up services required by existing city law.
- In St. Louis, a provision in the BPS law encourages deep retrofits. If a building undergoes a "deep retrofit" (to be defined in future regulations), it will be grandfathered under the BPS for 15 years, so a deep retrofit will bring a building into compliance for nearly four BEPS cycles.



Expectations of BPS Compliance



- Most respondents did not know about compliance.
- A few said that this might depend on the size of the fines that are established, with larger fines likely to result in greater compliance.
- A couple of respondents suggested that compliance will eventually be high, but there might be a delay of a few years after the legislated effective date (this is what happened in Boulder).



Actions Cities are Taking to Help Affordable Housing Comply with BPS

Action	City/State	
Additional time to comply	DC, St. Louis	
Funding and financing support	DC, NYC, St. Louis, Los	
	Angeles, Denver	
Easier compliance path	NYC	
Outreach and free advisory services	NYC, Los Angeles	
Use existing building as baseline to	NY State	
evaluate savings		
Allow other covered buildings to assist	Cambridge, MA	
affordable housing and earn savings		
credit		



Utility Credit for Savings from Building Codes and Equipment Efficiency Standards

- Multiple states plus the District of Columbia have paths for energy efficiency
 programs to get energy savings credit from improving building code implementation,
 and in some cases, for helping with code or appliance standard adoption.
 - Arizona: Investor-owned utilities can get credit for up to one-third of the evaluated savings from new building codes and standards the 1/3 is stipulated.
 - California: Utilities receive energy savings credit for statewide codes and standards adopted because of their efforts. Attribution to utilities based on Delphi panels.
 - Massachusetts: In Massachusetts, efficiency program administrators operate the "Code Compliance Support Initiative". Evaluation determines attribution factor to be applied to savings.
 - Minnesota: Under state law, utilities can claim credit for savings from building code implementation. The Minnesota Dept. of Commerce is working to clarify how this might work.
 - Rhode Island: The utility serving most of the state operates a Code Compliance Enhancement Initiative. Details are very similar to the Massachusetts program described above.
 - District of Columbia: The DCSEU is is providing training for code staff and the broader DC building community and preparing a variety of educational and technical assistance materials. The DCSEU is about to submit a savings claim for a portion of code savings.
 - Colorado: Xcel Colorado works with local jurisdictions to assist with upgrades to residential energy codes. They will claim credit for energy savings based on an independent evaluation that assesses the impact of the utility's efforts.
 - New York State: The NYPSC determined, on an interim basis, that when local jurisdictions adopt "stretch codes" stronger than the statewide building code, "the baseline for reporting of energy savings will be the minimum state code and customers will remain eligible for incentives"
 - Northwest: The Northwest Energy Efficiency Alliance claims credit for its work on codes and standards, and a portion of these savings can be claimed by utilities in some states.



Other Issues Covered in Full Paper

- Balancing state and local interests
- Financing
- Role of electrification
- Addressing other under-resourced properties



Recommendations

- Based on our findings, it is clear that energy efficiency programs have an important role to play in BPS implementation.
- There is no single best approach, and some experimentation will be useful to see which approaches will work.
- We recommend:
 - Bring stakeholders together to develop a common understanding of needs and intents.
 - Educate building owners and provide technical support.
 - Address workforce needs.
 - Find a path forward to allow efficiency programs to continue to offer financial incentives.
 - Establish program budgets adequate to meet needs, and if this is not possible, develop plans for rationing budgets.



Recommendations (continued)

- Establish baselines for program evaluation that reflect needs and likely BPS compliance rates for different types of properties.
 - It is important to determine how baselines and attribution will be handled before finalizing program plans.
 - Consider dividing buildings into two or three categories such as large buildings, medium/small buildings, and low-/moderate-income housing, with different values used for each category. For low-/moderate-income housing, we recommend using existing building conditions as the baseline, as New York State is now doing;
 - Once BPS penalties and other vital details are in place, survey building owners to get an understanding of their likely action plans to inform decisions about which buildings need the most help and how much energy savings credit efficiency programs should get for savings in different types and sizes of buildings.
 - As programs are implemented and evaluated retrospectively, these initial estimates can be revised.
- Consider experimenting with gross saving evaluation, targets, and incentives.



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"747", Winner 2022 "Fat Bear" Competition

