

How Energy Efficiency Programs Can Support Building Performance Standards

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Key Findings

- Energy efficiency programs are critical to help jurisdictions implement building performance standards (BPS) because the programs can educate building owners and provide financial and technical assistance. In the jurisdictions we examined with enacted and pending BPS policies, utilities and other program administrators have the right skill set to support successful BPS implementation.
- Efficiency programs should ramp up prior to required compliance dates to assist building owners in preparing for the standards. Budgets should be adequate to meet expected needs, with a focus on affordable housing and other under-resourced properties. At a minimum, policies should be implemented to minimize the possibility that sophisticated building owners will exhaust available program budgets and leave other owners (typically those that are smaller and have limited efficiency experience) stranded without assistance.
- Efficiency programs should continue after initial BPS compliance deadlines to assist building owners who have not yet reached compliance and to encourage savings beyond minimum requirements. Full compliance is unlikely until multiple years after the nominal compliance date. Furthermore, noncompliance could be widespread, depending on associated penalties. In these situations, program incentives will save energy and reduce emissions by helping to upgrade buildings that otherwise would have incurred penalties.
- Based on a variety of precedents discussed in this paper, we conclude that after BPS take effect, efficiency programs should continue to earn energy savings credits for improving affordable housing, and for improving other buildings relative to a modified baseline, one that is between current building conditions and a state in which buildings are in full compliance with BPS requirements.
- If efficiency programs are not involved in BPS implementation and not able to credit their efforts toward their energy-savings and other goals, then compliance rates, energy savings, and emissions reductions will be lower, and in some cases BPS policies could be rolled back or weakened.
- Well in advance of BPS compliance dates, utility regulators should make decisions on how programs will receive savings credit so that BPS administrators, building owners, and efficiency program administrators can plan their compliance and implementation activities.
- Bringing stakeholders together to develop a common understanding of needs and goals can be an important first step. Cities and efficiency programs should consider launching a joint initiative, “Partners in Energy,” to collaborate on these issues so that building owner and tenant needs are fully addressed.

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Introduction

BUILDING PERFORMANCE STANDARDS

Building performance standards (BPS) require existing buildings to meet some performance benchmark such as a measure of energy or carbon intensity. Typically, building owners have multiple years to bring buildings into compliance. BPS can achieve large energy savings because most buildings must be upgraded to achieve required energy performance. Nadel and Hinge (2020) estimate that BPS policies can typically reduce building energy consumption by about 30%. Technical and financial assistance to owners are key aspects of these policies. BPS policies are in place for high-energy-use commercial and industrial buildings in Tokyo, rental buildings in the United Kingdom and Boulder, CO, and office buildings in the Netherlands. Commercial building standards have been adopted in New York City, Washington, DC, Washington State, St. Louis, and Reno; details are being developed (the New York City, Washington, DC, and St. Louis programs include some multifamily buildings). France has a law for residential performance standards, with implementation details still being finalized. Similar policies are being considered in several other jurisdictions. In mid-2020, ACEEE published a paper outlining many of these policies and the issues they need to address (Nadel and Hinge 2020). In this paper we explore in much more detail how energy efficiency programs can best support BPS policies and how BPS implementers can work with regulators to help BPS policies achieve their objectives of significant energy savings and greenhouse emissions reductions.

CURRENT STATUS IN THE UNITED STATES

In the United States, the Boulder, CO, rental property standard is now fully implemented, with about 98% of covered buildings now in compliance (Boulder 2020). New York City, Washington, DC, Washington State, and St. Louis all passed their building performance standards in the past two years and they are now developing implementation details. In these jurisdictions, the standards are being phased in, beginning with the largest buildings. Initial buildings must be in compliance in New York City in 2024, in St. Louis in 2025, and in Washington DC, Washington State, and Reno in 2026. In addition, Boston, Cambridge, MA, Los Angeles, San Francisco, and Seattle are actively working to develop building performance standards. In all of these cities, BPS activities have been slowed a little by the COVID-19 pandemic but are still proceeding. Information on adoption and compliance dates is summarized in table 1.

Table 1. U.S. building performance standard adoption and compliance dates

Jurisdiction	Adoption year	Largest buildings	Compliance year	
				Smallest covered buildings
Boulder, CO	2010	2019		2019 (rentals only, 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)
Boston	TBD	TBD		TBD
Cambridge, MA	TBD	TBD		TBD
Los Angeles	2017	TBD		TBD
San Francisco	TBD	TBD		TBD
Seattle	TBD	TBD		TBD

* Reno's performance requirement has many alternative compliance paths that often provide lower-cost compliance options for building owners than meeting the specified performance level.

THIS BRIEF

In all of the jurisdictions with current or pending BPS, extensive energy efficiency programs are operated by utilities or other program administrators. An important question is what role these programs can and should play in the periods both before and after the performance standards take effect. In this paper we explore issues involved in addressing this question and report on the viewpoints of many of the program implementers and other stakeholders (e.g., city and state officials, regulators, efficiency organizations) who are thinking about these issues. At the end of this paper we make some recommendations on ways to proceed. Most of the BPS policies take effect between 2024 and 2026, so there is a little time to develop answers to this question; we are still early in the process. That said, cities and states need to consider the role of the programs soon, because they need to make decisions several years before the standards take effect. Preparation will help building owners, cities, states, and energy efficiency program administrators understand their roles and the roles of others.

Among the issues we address in this brief are the following:

- The importance of technical and financial assistance for building performance standard adoption, implementation, and long-term political viability.
- The management of such assistance in the period before building performance standards take effect.
- Emerging thoughts and discussions on how to address such assistance once standards become mandatory.
- Needs and experiences with affordable housing and potential exceptions for this sector.
- Needs and experiences with other under-resourced properties, such as houses of worship, municipal buildings, and Class B & C commercial space.

This brief does not review other implementation details of BPS policies nor make recommendations about those details, many of which were covered in our earlier paper (Nadel and Hinge 2020) and are beyond the scope of this short paper.

Our interview-based methodology for addressing these questions is discussed in the next section. Subsequent sections discuss the findings from these interviews, recommendations based on our findings, and brief conclusions.

Methodology

For our previous report (Nadel and Hinge 2020), we conducted a series of interviews with BPS program administrators, typically city representatives. For this report, we drew on the same interviews and also interviewed utility and other energy efficiency program administrators¹ (together called “program implementers”) in affected cities and states, experts in relevant subjects (e.g., evaluation, BPS), and some state utility regulators. We also consulted relevant literature. Our interviews focused on jurisdictions where BPS have been adopted, as well as places where they are under active consideration. We looked only at jurisdictions in the United States, because the regulatory framework in other countries is usually quite different. We covered the following jurisdictions:

- Boulder, CO
- Washington, DC
- New York, NY
- Washington State
- St. Louis, MO
- Boston and Cambridge, MA
- Los Angeles, CA
- San Francisco, CA
- Seattle, WA

Discussions on BPS implementation are still generally at an early stage and few decisions have been made. In many cases, organizational positions have yet to be decided, and there is hesitation to express opinions before the views of regulators are known. But for the most part, only a few regulators have begun to think about specific issues related to BPS and how energy efficiency programs should aid BPS implementation. As a result, to enable frank discussions, we promised interviewees that they would not be quoted by name and that we would report feedback either without attribution, or where needed, with reference only to a specific state or jurisdiction.

An outline of the subjects covered in the interviews is presented in the appendix. We conducted the conversations as semi-structured interviews; we did not follow the outline rigidly, but instead kept things conversational, asking follow-up questions and skipping questions that related to information that came up earlier in the discussion.

We developed a draft of this paper for review by our interviewees and other experts and, based on this review, refined our findings and recommendations.

¹ For example, the District of Columbia Sustainable Energy Utility is an example of a program implementer that is not an electric or gas utility.

Findings

In this section we report what we learned in our interviews, grouped by subject. We cover the following subjects:

- Energy efficiency program implementer role in adoption of BPS
- Energy efficiency programs prior to the BPS effective date
- Energy efficiency programs following the BPS effective date
- Utility credit for savings from building codes and equipment efficiency standards
- Expectations of BPS compliance
- Addressing affordable housing
- Addressing other under-resourced properties
- Research needs to prepare for and support BPS implementation
- Support for energy efficiency programs by other stakeholders
- Other issues that came up

In general, all of the interviewees made it clear that it is still early in the game and that decisions typically will not be made for a year or more. Everyone is still figuring things out. They provided initial thoughts; often these are individual thoughts, not organizational positions. It was also clear from these discussions that there is no single solution to any of these issues. As a result, in the sections below we provide a variety of examples and options. In the Recommendations section, we attempt to establish some order out of this range of options.

ENERGY EFFICIENCY PROGRAM IMPLEMENTER ROLE IN ADOPTION OF BPS

We asked efficiency program implementers how involved they were in discussions to establish BPS in their territory. In general, the program implementers provided input based on their expertise and experience (we discuss a few instances in sections below). However, the program implementers did not actively support the standards. As one person noted, they did not want to get ahead of their customers on this because customers will be much more affected by retrofit requirements than program implementers. In general, we got the sense that, as one interviewee noted, program implementers were “comfortable” with what passed.

While the program implementers were not active supporters, in two instances (the St. Louis BPS and a Los Angeles cool roof mandate), interviewees said that policy makers viewed the continued operation of utility energy efficiency programs as vital to helping building owners meet required targets. In St. Louis, BPS were designed, in part, with additional flexibility to address the unique regulatory demands placed on utility-funded programs (more on this below). In Los Angeles, prior to passage, the city council was assured that utility incentives would continue to be available.

ENERGY EFFICIENCY PROGRAMS PRIOR TO THE BPS EFFECTIVE DATE

All of the program implementers in these cities and states presently offer a broad slate of energy efficiency programs, including for commercial and multifamily buildings that will eventually be covered by BPS.

They all noted plans to continue these programs, at least up to the time when the standards apply to a particular building (the effective date of most standards for large buildings occurs earlier than for small buildings). [Note: We discuss the role of programs after the effective date in the next section.] Many program implementers expressed interest in expanding their programs prior to the effective date of the

BPS, encouraging early compliance. For example, education on the BPS could be offered and training provided for consultants and contractors. Several mentioned the possibility of enhanced incentives during this period. As one program implementer noted, “do improvements now and get incentives.”

One program planner noted an exception to this general finding. An option under their local standard is to reduce energy use 20% below a baseline, with the baseline being average building performance over three years. If this option is being used, efficiency improvements should be made only after the baseline is set, lest these improvements lower the baseline instead of contributing to the 20% savings target. Alternatively, the baseline period could be modified to permit improvements following the adoption of the standard to count toward the 20% savings goal.

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 (Washington 2019). This money, to be paid at the rate of \$0.85 per sq. ft. of building floor area upon project completion, is to complement normal utility energy efficiency budgets. While plans have not been finalized, the intention is to focus these funds on structural improvements that are difficult for efficiency incentives to cover. Given the number of eligible buildings in the state, the funds are not expected to last long.

Another interesting program to assist with preparations for standards is in Cambridge, MA. The city has worked with the local utility, Eversource, to set up a “concierge service” to help buildings now covered by the city’s benchmarking law to improve their energy efficiency. Eversource staffs the program and provides technical assistance and financial incentives, all covered by its energy efficiency budget (Shemkus 2019).² Eversource says that they “expect that we will continue the program as long as it’s effective.”

ENERGY EFFICIENCY PROGRAMS FOLLOWING THE BPS EFFECTIVE DATE

In general, there was broad agreement across our interviews that energy efficiency programs have an important role to play in supporting implementation after BPS take effect. For example, in the District of Columbia, a BEPSDC Taskforce was formed to advise the District government about the details of the BPS. In a brainstorming session, key implementation needs were identified: technical assistance, workforce development, and incentives/financing. The DC Sustainable Energy Utility (DCSEU) was identified as playing an important role in all three areas (District of Columbia DOEE 2020).

In the sections below, we pick up on these three needs, applying them to all the BPS covered in our research. Many cities mentioned technical assistance and incentives/financing, but only a few mentioned workforce development.

Technical Assistance

There was widespread agreement that education and technical assistance are needed to inform building owners about the BPS and assist them with implementation. In Washington, DC, in addition to working with the DCSEU, the District has hired a contractor to run a technical assistance hub. A similar hub is being considered in St. Louis. In New York City, the Building Energy Exchange will help fill this role, and it has also established a retrofit accelerator program. In Washington State, in addition to activities managed by utilities, the Washington Energy Extension Service will receive funding to

² The program website is here: www.cambridgema.gov/Services/buildingretrofitprogram.

provide technical assistance. In Los Angeles, the LA Better Buildings Challenge, funded by the LA municipal utility, offers technical assistance for complying with building requirements.³ However, these technical assistance services generally use a light touch, such as helping owners understand the law and compliance with targets; they also provide contractor referrals. Rarely do these efforts provide detailed technical services such as energy audits. As a result, several interviewees noted that energy efficiency programs should also continue to provide technical assistance, including assistance with audits and other technical services such as information on compliance strategies. This is particularly the case in places without technical assistance hubs, but we also heard it mentioned for the cities with hubs.

Workforce Development

In Washington, DC, the law establishing the BPS also established a Sustainable Energy Infrastructure Capacity Building Program, to be administered by the DCSEU. Workforce development will be part of this program. Several of the New York City programs also mentioned the importance of workforce development and are starting to work with contractors, the building trades, and building supervisors and managers on training programs. Another interviewee noted the importance of addressing equity (by race and income) in workforce development efforts; developing “green jobs” can be particularly advantageous in disadvantaged communities. Workforce development did not come up in our other discussions, although we generally did not ask specifically about this issue.

Incentives

Several interviewees noted that building owners want robust financial support. We were told that 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. A somewhat similar concern was expressed in NYC, but in this case the concern was stretching out the compliance schedule rather than outright repeal. It was noted that incentives will be particularly needed for small/medium buildings. We also heard a 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 (likely to be less experienced, small- and medium-sized-building owners) to receive the assistance they need.

DEVELOPING AND APPLYING A BASELINE FOR PAYMENT OF INCENTIVES

For energy efficiency programs, a baseline is established to measure energy savings. Depending on the state and program, the baseline may be the existing building condition, the requirement of a building code, or an estimate of normal market practice. Typically, state utility commissions provide guidelines on how to determine the baseline, and then program planners and evaluators propose the details, subject to utility commission review and approval. Additional information on practices in the different states is provided by York, Cohn, and Kushler (2020).

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 (we discuss some of the exceptions below). Some of our interviewees thought the same guideline might apply to BPS, because BPS, like codes, are requirements that builders and building owners must meet.

³ In LA, buildings must undertake an energy audit and retrocommissioning study every five years, or they can meet performance requirements such as achieving 15% energy savings, being ENERGY STAR certified, or achieving 25% better energy performance than similar buildings (Los Angeles 2017).

However, interviewees pointed out that BPS differ from building codes in a number of ways and therefore should be treated differently.

First, as noted above, policy makers in a few jurisdictions have explicitly set out an efficiency program role in BPS implementation. In these cases, this guidance from policy makers needs to be considered in establishing the impact of the BPS on energy efficiency program design and evaluation.

Second, regardless of whether there is explicit direction, BPS differ from codes in that building owners have many options to meet standards and have the option of paying noncompliance penalties. For new construction covered by building codes, noncompliance means not getting an occupancy permit, and the building cannot be used. For existing buildings, noncompliance means the building can be used, though it might incur financial penalties. Depending on penalty amounts, noncompliance could be widespread. In this situation, program incentives will save energy and reduce emissions by helping to upgrade buildings that otherwise would have incurred penalties.

Likewise, building owners have options to meet the BPS, including efficiency measures and other options such as solar, combined heat and power systems, or electrification.⁴ Efficiency programs can assist customers in choosing the best options, thus increasing benefits. In St. Louis, the targets in the bill were set as performance standards and not as prescriptive standards. With prescriptive standards, it could be argued that because the measures are required, there are no incremental savings benefits and that customers using a utility incentive would have installed the measure regardless. In contrast, adding multiple compliance pathways can help ensure that participants who rely on the utility energy efficiency program actively chose that program as the best available option. A similar rationale was applied in Boulder, CO, where the utility continued to provide incentives even as rental housing standards took effect.

In Washington State, baselines are generally set by a Regional Technical Forum (RTF) based on what a group of experts determines is market standard practice. Staff for the Washington Utility and Transportation Commission (UTC), the state utility regulatory commission, are thinking that maybe such panels can decide what baseline is, or because the RTF covers four Northwest states, it may have to use Washington State energy efficiency advisory boards.

Baselines can be set at various levels, ranging from ignoring the BPS targets (i.e., the “business as usual” case is the baseline) to assuming the BPS targets as baseline. There are also intermediate options. For example, the New York (State) Public Service Commission (NYPSC) decided that for the purpose of estimating net effects and reporting net savings,⁵ for most programs (going beyond programs in BPS jurisdictions), 90% of the gross savings can be counted and 10% are considered “free riders” (program participants who would have made efficiency improvements without a program) and will not be counted. Effectively, NY is establishing a realization rate that assumes 10% of the savings would have happened anyway and should not be attributed to a program. This approach of providing such specific numbers in advance is sometimes labeled “prospective evaluation.”⁶ In addition to resolving issues of

⁴ Electrification can often reduce total (source) energy use and almost always reduces site energy use because site energy use does not consider energy losses in the production of electricity.

⁵ Net savings are gross savings minus free riders (savings that would have happened even if the program were not offered).

⁶ Alternatively, “retrospective” evaluation involves determining free ridership levels based on an evaluation conducted at the end of the year.

savings credit, this approach is very simple to understand and implement. Several of the NY interviewees liked this general approach, suggesting that a specific figure can be agreed on, whether 90% or some other number. In NY, an advisory committee recommended the 90%/10% guideline and the NYPSC adopted it (New York PSC 2018). 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. Furthermore, the NYPSC is convening a new advisory panel to reconsider baseline issues (New York PSC 2020); one of the issues it is likely to consider is how to treat the NYC BPS.

In Missouri's utility energy efficiency programs, the number of free riders that are excluded from savings are estimated in retrospective evaluations. Evaluators ask a sample of program participants if they would have implemented specific measures even if a program did not provide technical assistance or incentives. Based on a series of questions, free ridership levels can be estimated (these estimates are often subject to debate, especially when they rely on surveys that require participants to recall why they participated in a program). After the BPS takes effect, the evaluation can also ask questions about BPS requirements and penalties to estimate free ridership. The net result of such an evaluation is to develop a specific estimate or range for free ridership levels over the past year; for example, an evaluation may estimate that 20-30% of program participants are free riders and so these savings should not be counted.

Following a somewhat similar rationale, another program estimated that after its BPS takes effect, lighting incentives may end because free ridership levels are likely to be high, but HVAC and control measure incentives may stay.

Retrospective evaluations of free ridership can be more accurate than prospective evaluations, but they make it more difficult for program staff to plan operations, as they won't know until the end of a year what savings will be counted and what will not be counted. They may also rely on survey methodologies that are subject to debate. 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. As discussed below, we believe a hybrid approach along these lines often makes sense. A recent study found that 61% of states determine free rider levels prospectively and 39% do so retrospectively (York, Cohn and Kushler 2020).

This discussion about baselines and free riders applies to most investor-owned utilities that are regulated by state utility commissions. Municipal utilities generally have more flexibility as they are generally regulated by their city council, not by state regulators. For example, the Los Angeles Department of Water and Power (LADWP, the LA municipal utility) can generally offer incentives to help customers comply with city law. When the LA city council adopted a requirement for cool roofs, the Council wanted to know that LADWP would continue to offer incentives as a prerequisite for adopting these requirements. In this case, to avoid double-counting, savings from LADWP programs are counted, but LA then backs out these savings when considering savings achieved by the cool roof standard. Likewise, in DC, the DCSEU is overseen by the Department of Energy and the Environment (DOEE) and not the Public Service Commission.⁷ DOEE also oversees the BPS and thus is likely to support programs that maximize the overall success of their initiatives. Conversely, in Seattle, the

⁷ A limited exception is that when DCSEU administers programs under contract to one of the local utilities, the DC PSC gets involved.

municipal utility generally does not provide incentives when a mandate is involved. This is a city council decision, but it is based in part on the interpretation of state policies and rules.

At the state level, more than one agency may be involved. In Washington State, as noted above, the legislature established an early compliance program with a role for utilities. The Department of Commerce, which administers the BPS, believes that this legislated provision means that utility incentives should continue to aid implementation of the BPS. They have discussed this issue with UTC staff.

INCENTIVES FOR IMPROVEMENTS THAT EXCEED BPS REQUIREMENTS

The preceding discussion covers the use of incentives to help meet BPS requirements. But not all buildings are subject to BPS incentives, 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. According to our interviewees, these buildings can also continue to receive incentives.

Furthermore, efficiency programs can offer better packages that help owners meet (and even exceed) BPS requirements. Regardless of the treatment of incentives to meet BPS requirements, savings that exceed BPS requirements will continue to be eligible for incentives. For example, in Seattle, the utility continues to offer incentives for retro-commissioning⁸ existing buildings, as these services go well beyond building tune-up services required by existing city law. Following BPS implementation, several of the utilities we talked to are thinking of offering comprehensive retrofit programs that will align with (e.g., use similar metrics) but go beyond BPS requirements. One utility mentioned the possibility of stepped incentives that increase per unit of energy saved as savings increase. Such stepped incentives can encourage deeper retrofits to exceed BPS requirements.

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. The BPS standards will be tightened every four years (six years for affordable housing), so a deep retrofit will bring a building into compliance for nearly four cycles.

AN ALTERNATIVE APPROACH: USING GROSS SAVINGS

The preceding discussion involves various approaches for estimating net savings – savings beyond what would have happened anyway, accounting for free ridership. Another approach is to count all savings, without considering free riders. Such an approach is often labeled “gross savings.”

If gross savings is used, then all savings beyond existing building conditions are included. As applied to BPS, gross savings will account for all energy efficiency program efforts to improve buildings beyond current conditions, including efforts to upgrade buildings to meet BPS requirements. However, because free ridership and other baseline adjustments are not made, savings are higher and “business-as-usual” savings must be considered in setting savings targets.

We asked interviewees what they thought about using gross savings both for BPS requirements and for all other programs and about raising savings targets to reflect gross savings. A few of the program implementers really liked this approach, saying it would be easier to implement without trying to

⁸ Commissioning a building means making sure that building controls and other systems are functioning as designers intended. Commissioning is common for new buildings, but over time, building systems often get out of adjustment. “Retro-commissioning” is a process for commissioning existing buildings.

measure free ridership. These implementers also thought that they should be able to earn shareholder incentives⁹ based on achieving gross savings targets. Some program implementers said their regulators would be unlikely to accept such an approach, as they are satisfied with their present approach and think that paying for free riders is not fair to ratepayers. And some were concerned about increasing program energy savings goals, even if the savings were gross savings. They were worried the new goals would be too ambitious.

BALANCING STATE AND LOCAL INTERESTS

Utilities are generally regulated at the state level, but, to date, BPS policies exist primarily at the city level (Washington State is the exception). This creates what one interviewee called the “split regulator” challenge, where state regulators need to consider both state and city needs but may be less attuned to city needs. This means that city officials may need to help make their case to state regulators. This also means that for issues such as establishing baselines, state regulators may need to have different standards for a BPS city and surrounding areas; the BPS may have an impact on the city’s baseline but very little impact beyond the city’s borders. Supporting such baselines may mean that evaluations should separately consider participation inside and outside BPS cities. There are also opportunities for vendor and customer confusion when policies and programs differ across city lines. Program implementers, with support from state regulators and regional officials, should consider steps to minimize such confusion.

Financing

Several interviewees noted the availability of other financial assistance as a complement to incentives. For example, in the legislation establishing the Washington, DC, BPS, substantial funds were allocated to the DC Green Bank. We were told this funding would be targeted to owners who lacked other financing options. Likewise, St. Louis plans to use its green bank, called “Set the PACE St. Louis.”¹⁰ In New York City, the Energy Efficiency Corporation, a nonprofit finance company, offers financing solutions to enable projects that save energy or reduce GHG emissions. New York City also adopted a commercial PACE financing law in parallel with the BPS. Several interviewees also noted wanting to use periodic building refinancing as an opportunity to include funds to cover building upgrades.

UTILITY CREDIT FOR SAVINGS FROM BUILDING CODES AND EQUIPMENT EFFICIENCY STANDARDS

In a number of states, utilities can get energy savings credit for activities supporting adoption and/or implementation of state building codes and equipment efficiency standards. Misuriello et al.(2012) surveyed utility roles in building codes by state. Significant energy savings are available, and utilities can assist in advocating for these policies and helping to implement them. If the utilities were not involved, adoption might not happen or would be less likely, or the policy would be more limited. Leading examples, including recent updates, include the following:

Arizona: Investor-owned utilities can get credit for up to one-third of the savings from new building codes and standards. As noted in the Arizona Corporation Commissions energy efficiency decision, and affirmed in subsequent utility-specific cases, “[a]n affected utility may count toward meeting the standard up to one-third of the energy savings resulting from energy efficiency building codes that are

⁹ Many utility commissions provide shareholder incentives or earnings opportunities if specific goals are met.

¹⁰ PACE is Property Assessed Clean Energy finance. PACE programs provide loans, with the loan payments put on the property tax bill. Because property taxes have high payment compliance rates, the risks of loan defaults are often reduced. The loan principal often stays with the property when ownership changes.

quantified and reported through a measurement and evaluation study undertaken by the affected utility" (ACC 2010). Since then, the same treatment has been afforded to appliance efficiency standards. The Salt River Project, a public utility, is not regulated by the ACC and can claim up to 50% energy savings from adoption of new codes and appliance standards (E. Zuckerman, Senior Associate, Southwest Energy Efficiency Project, email to S. Nadel on "Codes and Standards in Arizona," July 20, 2020).

California: Utilities receive energy savings credit for statewide codes and standards adopted because of their efforts. Utilities' federal standards efforts are also now included. Savings claims are reviewed by California Public Utilities Commission evaluators using a four step process: 1) calculating potential savings; 2) adjusting potential savings using survey-based compliance factors to derive gross savings; 3) adjusting gross savings to net savings by estimating (through a Delphi panel) what would have occurred had the standard not been enacted; and 4) estimating what share of net savings are attributable to utility efforts (using a second Delphi panel) (CPUC 2005).

Massachusetts: In Massachusetts, efficiency program administrators began the "Code Compliance Support Initiative" (CCSI) in 2014. Evaluation of this initiative involves estimating net savings from the utility efforts by first estimating gross energy savings from changes in compliance with the code and then multiplying by an attribution factor that identifies the portion of this increased compliance that is attributable to CCSI (versus that attributable to naturally occurring market adoption (NOMAD)). The attribution factor is determined every three years based on a process evaluation and a Delphi panel of experts (Mass Save 2015).¹¹

Minnesota: Under state law, utilities can claim credit for savings from building code implementation. The Minnesota Department of Commerce is working to develop a Codes and Standards Roadmap that will likely clarify how this might work. Specifics may be available in Fall 2020.

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.

In addition, several of our interviewees noted that they are claiming or proposing savings credit:

District of Columbia: The DCSEU is assisting the city's Department of Consumer and Regulatory Affairs (DCRA) to implement a new code that took effect in May 2020. DCSEU is providing training for DCRA staff and the broader DC building community and preparing a variety of educational and technical assistance materials. Based on these activities, the DCSEU is about to submit a savings claim for a portion of code savings in fiscal year 2020, based on a memo on attribution of savings from the DCRA's Green Building Division that was approved by DCSEU's client (DOEE) and DOEE's third-party evaluator (P. Boyd, Senior Manager, CSEU, pers. comm., Aug. 5, 2020).

Colorado: Xcel Colorado proposed a code advocacy and training effort in its July 2020 filing.

New York State: The NYPSC determined, on an interim basis, that when local jurisdictions adopt "stretch codes" that are more stringent 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" (New

¹¹ There is also an "annual ramp factor" that separates the three years of savings into annual increments.

York PSC 2018). We were told this was done so as not to discourage use of stretch codes. As noted above, the NYPSC plans to investigate baseline issues more fully beginning in the fall of 2020.

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.

These examples show other potential routes for program implementers to claim credit for work to assist with BPS implementation. Regulators could provide partial credit for the savings as in Arizona or for increasing compliance as has happened in DC and is proposed in Colorado.

In summary, seven states (including four Northwest 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. Several additional states are considering taking this step. These efforts show one possible path for efficiency programs to receive credit for assisting with BPS implementation, with such credit based on a preset percent of evaluated savings (Arizona) or on a variety of net savings methods (California, New England, and the Northwest).

EXPECTATIONS OF BPS COMPLIANCE

We asked interviewees whether few, most, or some buildings would comply with the standards after the effective date. Most respondents said they did not know. 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. One city thought that compliance would be high as fines will be hefty and it has generally competent building engineers with substantial prior building efficiency project experience. 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. For example, when the Boulder standard took effect, about 1,000 apartments were out of compliance (out of 23,000). A year later, non-compliance was down to about 500 apartments (Boulder 2019 and 2020).

ADDRESSING AFFORDABLE HOUSING

Affordable housing came up in many of our conversations. Affordable housing is important for low- and moderate-income households. Issues of affordable housing and racial equity overlap significantly because black and Hispanic households tend to have lower incomes and have frequently been victims of historic housing discrimination practices such as redlining (Rothstein 2017). Several of the BPS laws make explicit allowances for affordable housing.

For example, the Washington, DC, law adds two years to the compliance date for affordable housing and allows additional delays if a building demonstrates “financial distress” (details to be provided in forthcoming regulations). In addition, to help support implementation of the BPS, the legislation that established the standards provided increased funding support for energy efficiency, including for the Sustainable Energy Trust Fund, which funds multiple programs including the DC Sustainable Energy Utility, the main program administrator in the District. It also allocated \$70 million over six years to the DC Green Bank (DC Green Bank 2019) and \$3 million per year out of the city budget for affordable housing compliance with the standards starting in 2022. Finally, it allowed gas and electric utilities to again offer energy efficiency and demand-reduction programs with a particular focus on low- and moderate-income housing.

St. Louis also gives affordable housing two extra years to meet the standards and also updates the standards every six years for affordable housing, a slower update schedule than the four-year cycle used for other buildings. In St. Louis, utility incentives are particularly generous for upgrades to affordable housing. As noted above, expectation of continued utility incentives was important for passage of the BPS legislation.

In New York City, buildings with any rent-controlled apartments were excluded from the main BPS requirements, but there have been suggestions to include buildings where more than 35% of units are not rent controlled. Even if this change is adopted, the majority of affordable housing units will have limited coverage under the BPS; these buildings will need to implement a list of 13 moderate-cost prescriptive measures, such as individual temperature controls on radiators and outdoor reset controls for boilers (New York City 2019). New York City also has the Retrofit Accelerator, which offers targeted outreach and free advisory services to help building owners streamline the process of improving energy and water efficiency; it has served quite a few affordable housing projects (New York Housing Conference 2020).

In New York State, as noted above, for low- and moderate-income housing, the existing building is used as a baseline and thus free riders are assumed to be zero.

In Los Angeles, the municipal utility, in partnership with NRDC, is creating a local version of California’s Low-Income Weatherization Program (LIWP). For the past several years the program has been funded statewide by GHG reduction funds and was not able to serve LA sufficiently.

And in Cambridge, MA, they are considering a program to allow covered buildings to offset some emissions by helping to improve other Cambridge buildings, such as low- and moderate-income housing.

In sum, many cities recognize that affordable housing faces unique issues and needs additional resources, such as incentives, financing, and time, to comply with BPS (Nedwick and Ross 2020). Without such assistance, these buildings will struggle to comply, and there could well be proposals to exempt them from BPS requirements. The measures cities and states are using to address these needs are summarized in table 2.

Table 2. Actions cities are taking to help affordable housing comply with building performance standards

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

In Washington State, multifamily buildings are not covered by the BPS but may participate in the early adopter incentive program.

ADDRESSING OTHER UNDER-RESOURCED PROPERTIES

We also asked about other potentially under-resourced properties, such as houses of worship, municipal buildings, and Class B & C commercial space. In New York City, special conditions allow flexibility for houses of worship and for nonprofit hospitals and healthcare facilities as they comply with the BPS.

In Washington, DC, in addition to focusing on low- and moderate-income housing, the utility is considering focusing more on hard-to-reach and bigger upgrade needs that other city programs, such as the DCSEU, cannot afford. They mentioned municipal buildings, hospitals, and grocery stores—particularly in “food deserts”—as potential targets, based on experiences in other states.

One program manager noted that they can target hard-to-serve buildings with special marketing efforts, but outside of affordable housing, they would be reluctant to offer special incentives or services to different building types as this could be a slippery slope; once there is special treatment for some, many others will ask to be included. Affordable housing is different because there are established federal and local guidelines on who qualifies and who does not.

Regarding houses of worship, one interviewee noted that these are generally small buildings that are typically below the building floor areas covered by BPS.

In sum, in addition to affordable housing, some properties are under-resourced and are likely to require extra assistance to comply with BPS (see for example Drehobl and Tanabe 2019), including healthcare facilities, municipal buildings, houses of worship, and grocery stores in low-/moderate-income communities. Many programs are planning special outreach to these buildings, and in some cases, BPS laws provide some flexibility. We also note, based on responses to some of the questions discussed above, that for these under-resourced properties, non-compliance with BPS requirements is likely to be higher than for other buildings, and for those that participate in energy efficiency programs, free ridership rates are likely to be lower because they often lack the resources to undertake efficiency improvements on their own.

RESEARCH NEEDS TO PREPARE FOR AND SUPPORT BPS IMPLEMENTATION

We asked interviewees about research needs to prepare for and support BPS implementation. One respondent suggested that further research is needed on how buildings can meet standards with just operational improvements versus capital improvements. Clearly some buildings will require one approach, others will require the other, and some will require both. The suggestion was to better understand how many buildings fall into each category – how many can comply by changing behavior, and how many actually need new equipment?

Another suggestion we received was to include BPS savings in energy efficiency potential studies so that planners and policy makers can understand the potential impacts and determine how best to incorporate them in program and grid planning and future policy discussions.

We also received several suggestions for retrospective evaluations after BPS takes effect. For example, in jurisdictions that continue to allow energy efficiency programs to offer incentives to aid in compliance with BPS, to what extent are customer upgrade decisions driven by the programs or by the BPS? Also, what happens to rents (commercial and multifamily) after implementation? How are benefits of the higher efficiency shared between tenants and owners? There will be large variations among buildings, but what are the overall trends?

SUPPORT FOR ENERGY EFFICIENCY PROGRAMS BY OTHER STAKEHOLDERS

We asked program implementers what support they would like from cities, efficiency and climate advocates, building owners, and regulators as they figure out how best to support BPS implementation. We mostly got very general responses about wanting these other organizations to help work through the issues involved and to be supportive of a continued role for energy efficiency programs both before and after the BPS takes effect.

Some program implementers suggested that working together to develop a shared understanding of need and intent would be useful, so that program implementers and others can act on these needs. A few interviewees noted that when there is a common understanding of needs, it is usually much easier to figure out ways to best meet those needs. Several program implementers went a step further and urged that cities and other stakeholders work with state regulators to ensure that efficiency programs can play a prominent role in BPS implementation. Finally, some program implementers suggested that cities and efficiency programs should launch a joint “Partners in Energy” initiative to work closely on these issues so that building owner and tenant needs are fully addressed. The Cambridge, MA, partnership discussed above is a good example of such an effort.

OTHER ISSUES RAISED

The following other issues came up in our discussions:

- Utility demand-response strategies might help to reduce customer bills and help customers to better afford upgrade costs.
- There may be a role for market transformation strategies to help building owners meet BPS. Essentially, efficiency programs and BPS policies are elements of a strategy to ultimately decarbonize buildings. Using market transformation framing, we might be better able to restructure how these strategies and others can transform buildings so that decarbonized buildings are ultimately the market norm.
- How fees are levied could be important. One person noted that in one state a “penalty” cost cannot be passed on to tenants, but a “tax” can be passed on. In a related vein, “what is the right level of financial penalty to spur action?”
- The application of fees matters: do fees go into some city fund or could a building owner apply them to improvements to achieve compliance?
- One person in Washington State wondered how the state will monitor compliance and what data sharing will be allowed among the state, utility, and building owners.
- One gas utility wants flexibility to be able to promote no- and low-carbon fuels as a way to help meet a BPS that is based on GHG emissions.
- One electric utility noted that it would be more aggressive in its programs if electrification measures were included.
- One program implementer posed several questions regarding BPS and program details: How do we help overcome lease arrangements that do not incentivize tenant actions? How do we increase the level of technical and financial assistance for smaller customers? When we think of how to set the baseline for BPS initiatives, what is the timeframe for the baseline? Conditions just before the retrofit? A multi-year rolling average?

- A non-governmental organization involved in BPS implementation stressed the importance of good data on building energy use, specifically the importance of utilities ensuring that all meters in a building are included (it noted periodic problems), that multiple years of data are available to customers, and that customers are able to access data on their energy consumption in real time or near-real time. These steps will help customers understand their energy use and opportunities for improvement.

Recommendations

Based on our findings, it is clear that energy efficiency programs have an important role to play in BPS implementation. They are an important tool to help jurisdictions implement BPS because they provide financial and technical assistance to building owners and property managers. The energy savings potential from BPS is large, and utilities and other program administrators have strong skills and resources to support successful implementation. Regulators and program implementers will need to determine the attributable savings from efficiency program support for BPS. It is important to determine how such attribution will be handled before finalizing program plans. That said, there is no single best approach, and some experimentation will be useful to see which approaches will work. Needs will vary across jurisdictions depending on which organizations have significant resources to help. Still, there will be many commonalities across jurisdictions, and based on these generally common needs, we make the following recommendations:

Bring stakeholders together to develop a common understanding of needs and intents. This can be an important first step. We gave the example of how Washington, DC is doing this above, but somewhat similar processes are happening in many of the other jurisdictions.

Educate building owners and provide technical support. In every jurisdiction there is a need to educate building owners about upcoming requirements and provide technical assistance on how best to bring their buildings into compliance. Each jurisdiction will need to figure out how these responsibilities will be met, considering the capabilities of energy efficiency programs, state and local governments, and special hubs established in NYC and Washington, DC, and under consideration in St. Louis. However, it is very important that there be a robust needs assessment and planning effort, lest important needs remain either unaddressed or inadequately addressed.

Address workforce needs. Likewise, workforce needs will also need to be assessed and addressed. Washington, DC, has been a leader in this area and there are also notable efforts in New York City. Other jurisdictions should assess their own needs and learn from these examples. As BPS are likely to increase the need for skilled labor, it is also an opportunity to ensure that the jobs are more inclusive and diverse and benefit the local communities they are intended to serve.

Find a path forward to allow efficiency programs to continue to offer financial incentives. The role of energy efficiency incentives is an important one, and each state (and often city) will need to decide how it wants to proceed on this issue. To start, cities, states, and program implementers will need to assess local efficiency program capabilities and interest. From our research on jurisdictions that have or are seriously considering BPS, both the program implementers and local jurisdictions have strong interest in having efficiency programs heavily involved given their expertise, resources, and prior track records. In fact, interviewees from several jurisdictions expressed the view that if such support does not happen, BPS could be rolled back or weakened. Efficiency programs are an important resource, and in general, their role in appropriate applications should be encouraged, not hindered. We strongly recommend that decisions on efficiency program involvement be explicit and made in advance so that

all parties have a clear understanding of the program's role and remaining needs. For investor-owned utilities, state regulatory commissions need to be involved in these discussions. For cities with municipal utilities, city councils should make these decisions, as those in Los Angeles and Seattle have done.

Establish program budgets adequate to meet needs, and if this is not possible, develop plans for rationing budgets. All of the programs we talked with plan to continue offering incentives at least until the BPS requirements take effect. Program implementers will need to plan budgets for this period so that funds are not exhausted before the standards take effect. First-come, first-served rules could present political challenges if large, sophisticated owners exhaust budgets and the "little guys," who proceed more slowly, are left without resources. If possible, budgets should be large enough to address anticipated needs, but if this is not possible, plans need to be developed to ration available budgets and prioritize under-resourced properties, especially affordable housing.

Establish baselines for program evaluation that reflect needs and likely BPS compliance rates for different types of properties. For jurisdictions with investor-owned utilities, our research found widespread use of various net savings approaches for measuring program energy savings. These methodologies will need to be explicitly adjusted to reflect BPS. Although BPS have some similarities with building codes and equipment efficiency standards, there are important differences; for example, BPS have numerous compliance options, including paying penalties instead of reducing building energy use. At a minimum, incentives should be available for exceeding BPS requirements. More broadly, given the option of paying penalties in lieu of reducing energy use and emissions, we recommend that some compliance incentives be allowed. Such incentives will be especially needed for affordable housing and other under-resourced facilities, such as healthcare facilities and less sophisticated, small owners.

As discussed above, in New York State and Missouri for programs in general, and in Arizona, California, Massachusetts, and Rhode Island for building codes and/or equipment standards, a specific value or methodology should be developed via discussion and analysis of available data and periodically refined based on new evaluations and data. When values are revised, the new values should be applied prospectively, not retrospectively. Such an approach might divide 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; without full program assistance, such buildings will often have difficulty meeting the standards and could pass significant costs on to tenants, making it more difficult for low- and moderate-income households to afford these apartments.

Once BPS penalties and other vital details are in place, building owners can be surveyed 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. By using approaches such as these, rules will be clear and cities, states, and program implementers can work toward the "partners in energy" concept espoused by several of our interviewees and demonstrated in Cambridge, MA.

Consider experimenting with gross saving evaluation, targets, and incentives. Another option is to move beyond net savings and use gross savings instead. Such an approach would be simpler, but energy savings goals would have to be revised in states that now have net savings goals, because gross savings

are generally higher. Furthermore, such an approach could necessitate documenting free riders that are unaffected by a program, as that would be one way for a program implementer to document compliance with goals unless there are specific prohibitions on such a practice.¹² One possibility might be for one or two states with BPS to move forward with a gross savings approach, as least for BPS savings, and conduct a thorough retrospective evaluation of the benefits and challenges, allowing others to learn from their experience.¹³

Conclusion

Energy efficiency programs are now active in all of the U.S. jurisdictions that have either enacted or are seriously considering BPS. Continued support from energy efficiency programs to assist with BPS implementation will be critical, as these programs have the skills, resources, and proven track record in providing technical and financial assistance to building owners to help them successfully undertake energy efficiency projects. Needed steps include the following:

- Bring stakeholders together and develop a common understanding of needs and intents.
- Educate building owners about the upcoming requirements and provide technical assistance on how best to bring their buildings into compliance.
- Assess workforce needs for BPS implementation and identify shortfalls and ways to address them.
- Develop an approach for energy efficiency programs, together with other stakeholders, to provide ongoing technical and financial assistance to building owners seeking to comply with BPS. Such programs should be ramped up prior to required compliance dates but continued after required compliance dates as full compliance is unlikely until multiple years after the nominal compliance date and continued assistance will be needed to exceed BPS minimums. If non-compliance penalties are small, many buildings may choose to pay penalties instead of reducing their energy use and emissions.

BPS administrators (cities and states) will need to take the lead on the first three items. Energy efficiency programs and their regulators, with help and support from BPS administrators, will take the lead on the fourth.

We recommend that efficiency program and other budgets be scaled to meet expected needs. At a minimum, policies should be put in place to minimize the possibility that sophisticated building owners exhaust available budgets and leave other owners, who proceed more slowly (typically smaller and less-sophisticated owners), stranded without assistance. After BPS take effect, efficiency programs should continue to earn energy-savings credits for affordable housing compared to current building conditions and savings compared to a modified baseline for other buildings (with details established by each state). If efficiency programs are not involved and not able to credit their efforts toward their energy savings and other goals, then compliance rates, energy savings, and emissions reductions will be lower and, in some cases, BPS policies could be rolled back or weakened. Utility regulators should

¹² This is what happened in Ohio a few years ago when energy efficiency legislation allowed large industrial customers to count prior energy efficiency investments toward the utilities' obligations in the early years of the program and book excess savings to count against future savings requirements (Smith 2015).

¹³ A few states now base program evaluations on gross savings instead of net savings, but none of these are BPS states. We are not aware of any studies evaluating how gross savings have worked in these states.

make decisions on how programs will receive savings credit well in advance of BPS compliance dates, so BPS administrators, building owners, and efficiency program administrators can plan their compliance and implementation activities accordingly.

Building performance standards can achieve large energy savings and will be an important part of efforts to achieve long-term energy and climate goals. Energy efficiency programs will be vital for BPS policies to be successful.

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Appendix: Interview Questions

1. What types of energy efficiency programs and services does your company/organization/state currently have for commercial (and multifamily) buildings?
2. Do you anticipate any changes in the period prior to the effective date of the standard?
3. Was/is your company involved in discussions to establish a BPS? What specific role(s) did you play? Has there been any discussion on whether you should get energy savings credit for adoption of the BPS?
4. Once the BPS takes effect, which statement best captures your opinion?
 - a. All or nearly all buildings will comply
 - b. Many buildings will comply, but there will be some laggards
 - c. Some buildings will comply, but many will struggle to comply
 - d. Only a few buildings will comply, and many will fall short
5. Once the BPS takes effect, what do you anticipate your role will be in promoting energy efficiency to covered buildings? Specifically ask about TA and incentives if they do not mention these.
6. Do you anticipate treating all covered buildings the same or might there be different approaches for some under-resourced properties such as affordable housing, houses of workshop, municipal facilities, and Class B & C commercial properties? Which?
7. Do you think city officials will be supportive of these plans or might they push for you to do more or less? If you follow through in this manner, might they change the BPS policy and, if so, in what ways?
8. Do you think utility regulators will be supportive of these plans or might they push for you to do more or less? Probe about attribution if they do not mention it.
9. Is there any market research, work on theory of change, or evaluation that would be useful to help establish a baseline before the BPS takes effect? What evaluation do you anticipate doing after the BPS takes effect?
10. If someone were to suggest that utility savings targets and utility savings credit include the BPS, how would you react?
11. How can cities, efficiency and climate advocates, and regulators best support the efforts by your company/organization/state to assist with BPS implementation? What else should they be doing?