

# A Lifecycle Approach to Building Performance Regulation



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# Energy Codes, Building Performance Standards, and the Missing Link

Construction codes, including energy codes, dictate minimum design and construction requirements for new construction and existing buildings when significant renovations occur. Building Performance Standards (BPS), on the other hand, address only performance in existing buildings. This lack of overlap, exacerbated by the fact that codes and BPS are developed independently through different processes with different goals, creates a challenging dynamic for jurisdictions in implementing a BPS. If newly constructed buildings meet the code requirements but don't meet the BPS performance levels and thus need to immediately invest in upgrades, the result will be political backlash and potentially lawsuits for the jurisdiction. Ideally, jurisdictions can harmonize

their regulations to create a comprehensive, integrated approach to building performance that covers the entire building lifecycle from design through construction, occupancy, operations and maintenance, and replacements and upgrades, all the way to major renovations and demolition/deconstruction. While this ideal end state requires overcoming administrative, statutory, and cultural barriers, progress can be made by identifying individual areas where change is needed and providing practical, politically viable solutions. This document examines some of the most important areas to consider and presents actions cities can take to make progress towards a building lifecycle approach to regulation.



## Current Energy Code Limitations

Current energy codes offer two basic compliance paths: prescriptive and performance. The prescriptive path dictates specific requirements for each building element, while the performance path looks at the building as a whole, allowing trade-offs between individual components. The performance path, which requires energy modeling, has the closest tie to real-life building performance, but is far from perfect. Energy models are highly valuable for weighing multiple design scenarios and trade-offs because they take into account the interactivity of all equipment and components in a building. Comparing predicted energy use from each scenario can thus help to optimize design, but it is well documented that these predictions are unreliable in determining actual post-occupancy performance.

Several factors contribute to this discrepancy, including the quality of information put into the model, the experience of the modeler, variances in final construction versus design, and, most important, how the building is actually operated relative to the assumptions that were used. Even

more fundamental in the context of this document is that a building modeled to meet code is not necessarily a building modeled to meet BPS. While future BPS requirements may be set far in advance, new buildings need only meet code requirements in place at the time a permit is issued. And, since codes by definition establish minimum requirements, a fundamental structural barrier is that many jurisdictions cannot legally require new buildings to exceed the code, regardless of future BPS requirements.

Changing current energy codes to address performance will require a change to state statutes in most areas of the country. Mandating modeling for all projects might be a good step (particularly if the jurisdiction tracked projected versus actual performance over time and calibrated accordingly) but this would increase costs for owners and designers, especially for smaller projects. That said, in the absence of a lifecycle performance mechanism, modeling remains the best means of numerically estimating post-construction energy use.

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# Near-Term Steps

In many states, a definitive solution that ensures new buildings will meet long-term energy performance standards after construction will require politically difficult changes that could take years to put in place; however, in the interim, there are steps that jurisdictions can take to better align codes and BPS without placing an undue burden on either jurisdictional staff or building owners.

## 1 | Communicate with industry.

To minimize adverse consequences that may arise from confusion between the energy code and BPS, jurisdictions should conduct a thorough communications campaign to inform design and construction professionals, developers, and real estate firms about the relationship between the two, and ensure that they understand that new buildings will need to be designed and constructed to comply with both the energy code and upcoming BPS requirements.

## 2 | Improve code compliance.

Efforts to ensure that buildings operate as designed will narrow the gap between predicted and actual performance. Cities and counties can make plan review and field inspections a priority for their building departments and ensure that sufficient funding is available to dedicate time specifically to compliance with energy codes. Providing training for plan reviewers and inspectors to identify high-impact code requirements that typically have low compliance rates and providing staff with practical solutions will maximize their impact and allow them to make efficient use of their time.

## 3 | Encourage innovative industry practices.

One potential solution is to eliminate the separation between design and construction on one side and operations and maintenance on

the other side. The design-build-operate-maintain (DBOM) model makes design/build contractors responsible for operations and maintenance of the facility for a set period of time after construction. The DBOM model forces architects, engineers, and contractors to consider the implications of their choices during design and construction on building operations, as they now have a vested stake in how well the building actually performs. This approach has been successfully pioneered in a very limited set of buildings and offers a robust solution to many of the issues addressed in this document. A first step would be for state and local governments to raise awareness of DBOM and promote its use through incentives or public recognition. Working with the design and construction industry to identify legal and financial concerns and create solutions will signal good intent on the part of jurisdictions and increase industry interest.

## 4 | Align enforcement with the building performance lifecycle.

As of January 2021, two of the four jurisdictions that have adopted a BPS to date have left code enforcement to building departments while placing enforcement of BPS in a separate department. St. Louis and New York City's approach of aligning the complete building lifecycle under a single agency will likely facilitate better enforcement at all stages. This approach also pairs well with a DBOM project or, eventually, a revised code. Such a change would require careful planning.

## 5 | Promote statutory alignment.

Energy codes are usually adopted at the state level while three of the four BPS ordinances adopted as of January 2021 have been at the local level. Having one jurisdiction regulate the full building lifecycle would eliminate much of the misalignment inherent in the current situation. The problem can be solved by having either the state or the local government develop and adopt both the energy code and the BPS ordinance. While Washington State, which adopts a state-wide energy code, adopted a BPS at the state level, this did not occur in the context of a larger legislative discussion about building lifecycle regulation, so the BPS ordinance does not touch on new construction. Cities and counties in states where local jurisdictions are empowered to adopt their own energy code offer excellent opportunities for an integrated building lifecycle ordinance. A meaningful first step is simply to start a dialogue by convening the full set of stakeholders, introducing the concept and determining what initial steps would lead toward an eventual alignment.

## 6 | Document results and costs of BPS.

Much of the political opposition to building performance standards is based on economic uncertainty; some owners fear that they might be forced to make investments they see as providing a poor return. In order to gain wider support for BPS, particularly on the state level where there is more variance in the political landscape, jurisdictions pursuing a BPS should allocate substantial resources to estimating buildings' costs and savings associated with complying with a potential BPS. Rigorously documenting the expected financial benefits of compliance and communicating them to building owners can help reduce opposition to BPS specifically and to the statutory changes needed to align it with codes. Another cost-related activity that can be undertaken at any level is to actively encourage utilities to provide incentives that support BPS compliance. Local governments should consider investing time learning about the utility regulatory process to understand how they can be most effective in achieving their goals.

# Planning for the Future

Enacting the steps listed above will help jurisdictions reconcile potential gaps between building design and performance, but they are not long-term solutions. In order to achieve true alignment of the components of the building lifecycle, significant changes to the code, its enforcement, and how compliance is measured are required.

To derive a solution that can work for everyone, continued and earnest discussions involving all stakeholders—designers, contractors, owners, governmental officials, etc.—will be necessary.

For more information on building performance standards, visit [imt.org/bps](http://imt.org/bps).



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