



Building Performance Improvement Board

3/1/2023

Learn more at <https://www.montgomerycountymd.gov/green/energy/beps.html>

Agenda

- **Administrative items**
- **Recap actions from previous meeting**
- **Building Performance Improvement Plans:**
 - **Qualifying Scenarios**
 - **Circumstances outside owners' control**
 - **Economic infeasibility**
 - **Improvement Measures & Cost-Effectiveness**
 - **Verifying Implementation**



Administrative Items

Actions

- Approve 2/15 meeting notes
- Finish trainings (emailed those still needing to complete ethics training)
- Submit travel [reimbursement form](#) by April 30 (will email following meeting)

BPIB Recommendation Report

- Summary report on building group recommendations emailed to Board
- Working on site EUI target section



Previous Meeting Recap

Recap

- Considered qualifying scenarios for circumstances outside owners' control from other jurisdictions
- Began discussing how to define and document “economic infeasibility”



Building Performance Improvement Plans: Qualifying Scenarios

Qualifying Scenarios

The Law says:

- If a covered building owner cannot reasonably meet one or more of the applicable interim or final performance standards due to economic infeasibility or other circumstances beyond the owner's control, based on guidelines established by regulation, the owner may submit a proposed building performance improvement plan to the Department for review and approval by the Director in consultation with the Building Performance Improvement Board.

Qualifying Scenarios and Documentation

Scenario	Documentation
Planning for end of equipment system life	Detail the equipment and age of each system, compare vs standard service life chart
Planning for major renovation / redevelopment planned	Thoughts?
Historic building	Detailed description of the unique limitations placed on the building and how that prevents it from meeting the EUI target; proof of historic designation
Benchmarking waiver (including financial distress)	Outlined in benchmarking waiver request. Would confer a one-year delay for the benchmarking period waived (e.g. waiver for interim BEPS year benchmarking means you have an extra year to meet the target)
Natural or man-made disasters	Documentation of disaster (fire, flooding, etc) and impacts to building operations and finances
Change of building ownership where the new building owner will have difficulty in complying on time	Proof of sale of building and narrative explaining the new building owner's inability to comply on time (for example, new owner purchases the building in 2028 and previous building owner did not make progress towards 2028 target).
Pending demolition	Demolition permit or documentation of planned, future demolition – thoughts on how many years prior to demolition to allow? Benchmarking waiver only available for calendar year in which demo permit is received.

Qualifying Scenarios and Documentation

Scenario	Documentation
Planning for financing cycles	Proof of affordable housing status; description of the funding strategy that will be pursued to implement interim and final EEMs and/or retrofits to meet the savings target. Description should provide an estimate of the projected funding sources (property operating income, reserves, private financing, public financing, etc.) needed and the estimated costs to be incurred to meet the requirements.
Innovative approach to energy efficiency	Narrative from architect/engineer detailing the benefits of the innovation, the novelty of the project, demonstrated that the EEM has not been widely implemented by the local building industry, and why delays are anticipated and/or cannot be avoided.
Other reasons considered by DEP on a case-by-case basis	Could include limitations to buildings on a steam loop or other district system, could include difficult to electrify systems

Discussion

- Others (besides economic infeasibility) than those presented in the previous slides?
- If others, what documentation would suffice to substantiate claim

Picking a “Pathway” / Applying for a BPIP

- DC BEPS has multiple pathways for buildings not meeting the BEPS; requires owners of buildings not meeting the first cycle BEPS to pick a pathway by April 1, 2023
- DC’s first BEPS cycle ends December 31, 2026, with end-of-cycle reporting due April 1, 2027
- For County’s BPIP process:
 - Helpful to have a two-part process? First apply to determine BPIP eligibility, if approved, then submit a BPIP
 - The owner must submit a building performance improvement plan to the Department at least 90 days before the deadline for submitting documentation of compliance with interim or final performance standards (e.g. September 30, 2028 in advance of Dec 31, 2028 interim BEPS for County, Group 1, and Group 2 buildings)
 - Helpful to have a deadline for applying for BPIP eligibility to keep building owners on track? Or creates unnecessary extra requirement?
 - How long would a BPIP take to prepare? If a deadline seems necessary, how long before the interim/final BPIP submission date would an owner need to submit documentation on qualifying scenario?

Economic Infeasibility Recap

- Economic infeasibility may include circumstances where:
 - The target is technically impossible to achieve after considering all measures (including envelope, electrification, solar, etc.)
 - The up-front costs of the EEM package to reach the BEPS cannot be afforded even after considering all available incentives, financing options, and ownership structures
 - The financial benefits of the EEM package that would reach the BEPS are so low that the owner cannot justify putting in the capital or cannot receive financing for the measures?

Economic Infeasibility Recap

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Economic Infeasibility Considerations: St. Louis

- St. Louis may be the only jurisdiction that has outlined “severe economic hardship” in technical guidance:
- Permissible circumstances of financial hardship include those where a property:
 - Can demonstrate that they have already invested substantially in energy efficiency and additional investments do not have reasonable financial returns
 - A financial institution owns the property due to a loan default
 - The property has a senior mortgage subject to a notice of default
 - **The property has other significant cash flow limitations or is bankrupt.**
 - *The property was placed on the city’s annual tax lien sale list within the last two years because of arrears of property taxes or water or refuse charges.*
 - *A court appointed receiver is in control of the asset due to financial distress*
 - *The property has been acquired by a deed in lieu of foreclosure*

Note: these are grounds for a waiver in County law, exempting the building from benchmarking for any period that financial distress was evidenced

Economic Infeasibility Documentation

- To document any of the three scenarios, significant up-front study will be needed to document things like:
 - All potential EEMs to reach BEPS
 - Projected costs of the optimized EEM bundle to meet interim/final BEPS
 - Available incentives
 - Incremental cost of replacement for equipment at/near end of life
 - Benefits of reaching the BEPS
 - Utility savings (with pre-set rate projections)
 - Maintenance savings
 - Avoided penalties (with pre-set penalty amounts, e.g., social cost of carbon)
 - Other benefits? – rents, asset value
 - Leasing structure and ability to recoup savings (do benefits accrue to the owner or tenants)?
 - Funding options
 - Documentation of capital budgets, reserves, cash-flow
 - Financing options and rates
 - Ownership models (ESCO, solar PPA)

Discussion

- Based on all the variables/documentation DEP would request from the previous slide, we can continue discussing the best objective metric/calculation to demonstrate economic infeasibility
- Can leave more subjective given that each building has unique financial circumstances, efficiency opportunities, and resultant costs and review such applications on a case-by-case basis (in conjunction with the Board and perhaps enlisting a contractor) (and/or detail further in technical guidance)



Building Performance Improvement Plans: Improvement Measures & Cost-Effectiveness

Regulations: Building Performance Improvement Plans (BPIPs)

The law says, BPIP must include:

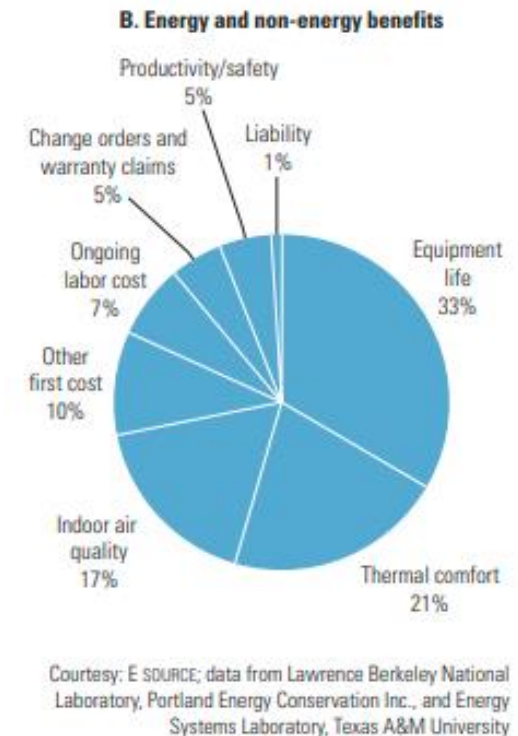
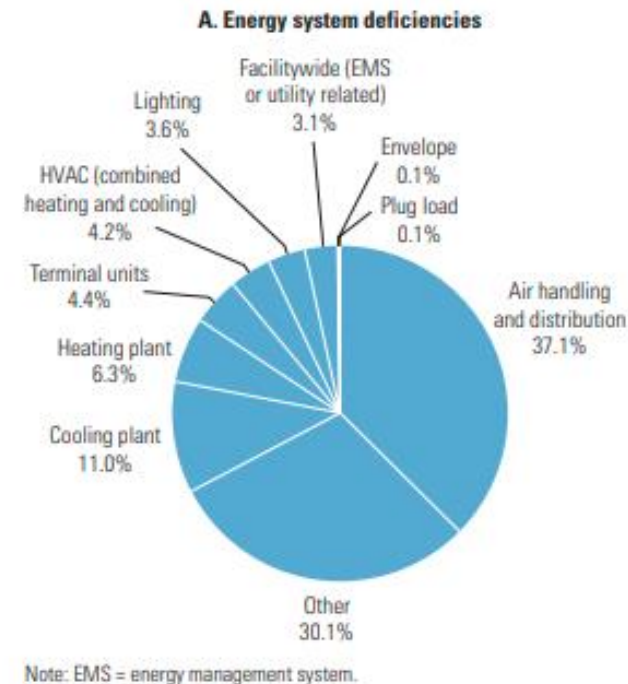
- Documentation of economic infeasibility or circumstances beyond owner's control
- List of potential improvement measures, including energy savings & cost-benefit analysis;
- Plan and timeline for achieving energy improvements to the building's performance that will provide cost-effective energy savings, including estimated savings of implementing all cost-effective measures;
- Procedures for correcting any noncompliance or deviation from the plan.

Energy Audits

- Most other jurisdictions with alternative compliance paths require ASHRAE level 2 audit (plus jurisdiction-specific fields)
- Energy audit may need to be done to document need for a BPIP (like economic infeasibility) and could then be used to document all potential measures, all cost-effective measures, and the timeline for executing those measures
- DEP could require use of vetted auditor or some parameters around credentials or being a 3rd party company
 - Most jurisdictions dictate that the auditor must be a 3rd party and hold one of several accepted credentials (PE, Certified Energy Auditor, Certified Energy Manager, etc)
- DEP could require inclusion of some fields or set uniform parameters for things like utility rates, equipment life, etc., e.g.,
 - Other jurisdictions using a DOE platform called Audit Template for collecting all required data
 - For project costs: require use of incremental cost of replacement, show all possible incentives, financing, and cash flow resources
 - For project benefits: require use of uniform projected utility rates, include maintenance savings, include other benefits like rent, tenant retention, cap rate, etc., include avoided penalties

Retro-Commissioning (RCx)

- Process of verifying that installed equipment is operating efficiently and providing the services necessary to meet the needs of the building's occupants.
- Systematic investigation that optimizes building performance by identifying and implementing relatively low-cost operational and maintenance improvements, of individual equipment and systems
- [LBNL 2009 study](#) showed average costs of \$0.30/sf, median energy savings of 16%, and a 1.1 year SPB, plus additional non-energy benefits to equipment life, comfort, IAQ, etc.
- St. Louis allows retro-commissioning (RCx) or energy audit as basis of alternative compliance plan.
 - RCx may only be done once per property in the first two BEPS Cycles. May make exceptions for properties that change ownership or Property Type during this time.



O&M Practices

- Denver and Washington State both require additional documentation that operations and maintenance (O&M) best practices are established and being followed (per ASHRAE standard 100 6.2 – 6.4)
 - Denver requires only for buildings pursuing a timeline adjustment
 - Washington State requires for all buildings
- Can help assure that sound O&M practices have been integrated into building operations to maximize no- and low-cost savings opportunities

Discussion

- Thoughts on which process or combination of “improvement plan” is most likely to result in an actionable building plan and yield demonstrable energy savings?
 - Option 1: ASHRAE Level II audit
 - Option 2: ASHRAE Level II audit + O&M plan
 - Option 3: ASHRAE Level II audit where retrocommissioning (or proof of ongoing, monitoring-based Cx program) is a mandatory EEM that must always be completed
 - Option 4: ASHRAE Level II audit + O&M Plan + RCx (or proof of ongoing MBCx program)
 - Requirement that RCx be done prior to qualifying for a BPIP?

Regulations: Building Performance Improvement Plans (BPIPs)

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- List of potential improvement measures, including energy savings & cost-benefit analysis;
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- Procedures for correcting any noncompliance or deviation from the plan.

Implementing Cost-Effective Measures

- BPIP will be required to show a list of improvement measures, including energy savings & cost-benefit analysis (similar info as discussed on slide 17 when applying for economic infeasibility)
- Few examples of defining “cost-effective” in other BEPS laws:
 - Washington State requires buildings using investment criteria for compliance to complete a life cycle cost analysis (LCCA) and implement an optimized bundle of energy efficiency measures that provide maximum energy savings without resulting in a savings-to-investment ratio (SIR) of less than one
 - $(SIR = \frac{\text{projected cost savings over the lifetime of the measures}}{\text{total installed cost of the project}})$
 - SIR < 1 measures alone unlikely to encourage an EEM package that meets state decarbonization requirements and may be subject to manipulation
 - St. Louis requires “agreed-upon ECMs” or completing its retro-commissioning within the approved timeline

Discussion

- Thoughts on cost-effectiveness metrics and criteria?
- Thoughts on tying cost-effectiveness to building-specific financials (which would require more documentation) or applying more broadly?



Building Performance Improvement Plans: Verifying Implementation

Regulations: Building Performance Improvement Plans (BPIPs)

The law says, BPIP must include:

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- Procedures for correcting any noncompliance or deviation from the plan.

If, after consulting with the Building Performance Improvement Board, the Director approves the building performance improvement plan, the owner must record the building performance improvement plan as a covenant in the County land records and deliver a certified copy of the recorded plan to the Department.

After the Director receives the certified copy of the recorded plan, the covered building will be deemed to be in compliance with the applicable interim or final performance standards as long as the owner fulfills the terms of the building performance improvement plan within the timeline specified in the plan.

Following Through on BPIPs

- Some jurisdictions validate by *monitoring performance* in subsequent benchmarking reports.
 - Denver - as timeline or target adjustments, the owner receives a new site EUI target that would result from implemented measures, or a new timeline within which to meet the standard target. The building owner must demonstrate that the new target EUI or new timeline was met in subsequent benchmarking reports
 - Washington State - Post implementation energy savings shall meet or exceed 75% of the energy savings projected in the energy audit report.
- Some jurisdictions validate by *tracking measure installation*
 - Washington DC – Prescriptive Pathway: Action-based compliance method that includes reporting milestones and implementing one or more recommended energy efficiency measures (EEMs) designed to achieve energy savings (a minimum Site EUI reduction of 20%) comparable to the Performance Pathway. Compliance under the Prescriptive Pathway is met by successfully completing specific actions and meeting reporting/verification requirements. So long as they successfully implement the specific approved EEMs and meet all reporting/verification requirements, the building will comply, regardless of its measured energy performance.
 - Owners opting for the “prescriptive” pathway must submit an Implementation Report, including 1) an Implementation Verification with supporting documentation to verify the EEMs were installed as approved, and 2) an attestation of implementation of the approved O&M program.
 - St. Louis - If the property fulfills the terms, including installing agreed-upon ECMs or completing its retro-commissioning within the approved timeline, then the property shall be in compliance with BEPS as outlined in the CACP

Discussion

- Thoughts on verifying project implementation?
- Demonstrate compliance through performance? Through reporting? A combination of both?

Failure to Follow-through on BPIPs

- Most jurisdictions subject building owners to similar BEPS penalties if they fail to carry out BPIPs
 - Denver = The earlier the application is submitted and approved; the lower possible penalty amount the building could be assessed in the future. Penalties may be higher (\$0.50/kBtu vs \$0.30/kBtu) the longer someone waits to file.
 - St. Louis = same penalties as performance pathway
 - Washington State = same penalties as performance pathway, though “conditional compliance” can be applied if the investment criteria verification requirements will not be met by the scheduled compliance date. Applicants can avoid potential penalty when Conditional Compliance is approved and requirements maintained
- County has more constraints on penalties, but are there any thoughts as to other consequences of not following-through on BPIPs?

Next Steps

- May need to continue discussing economic infeasibility
- Renewable Energy Allowance discussion

Helpful Links

- [Benchmarking and Performance Standards Law](#)
- [Benchmarking Website](#)
- [BEPS Website](#)
- [Building Performance Improvement Board Website](#) (will include agendas, notes, and presentations)
- [BEPS Stakeholder workgroup + report](#) – completed before bill was introduced to gather stakeholder input on BEPS policy elements
- [BEPS Technical Report](#) – outlines options for site EUI targets by building type group and assesses feasibility and costs in representative case study buildings
 - [Presentation](#) of BEPS Technical Report to Council Transportation & Environment Committee
- [Allowance for Renewable Energy Technical Report and Recommendations](#) - provides information on determining how a renewable energy allowance should be defined and implemented within BEPS regulations
- On weather and business normalization:
 - [EPA technical reference guide on weather normalized energy use](#)
 - [EPA's Recommended Metrics and Normalization Methods for Use in State and Local Building Performance Standards document](#)

Helpful Links (continued)

- [Maryland Clean Energy Center 10/25 Webinar, Solutions to Achieve Building Energy Performance Standards recording](#)
- [Maryland Department of Environment BEPS page](#)

Questions?

Emily Curley

Building Energy Performance Programs Manager

Emily.Curley@MontgomeryCountyMD.gov

240-777-7707

BPIB Webpage

<https://www.montgomerycountymd.gov/green/energy/bpib.html>

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DEPARTMENT OF
**ENVIRONMENTAL
PROTECTION**



Building Performance Improvement Plans Background

Regulations: Building Performance Improvement Plans (BPIPs)

The Law says:

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- ...the covered building will be deemed to be in compliance with the applicable interim or final performance standards as long as the owner fulfills the terms of the building performance improvement plan within the timeline specified in the plan.

Regulation Purpose:

- Define economic infeasibility and other circumstances beyond the owner's control that dictate whether the building is eligible for a BPIP



The law says, BPIP must include:

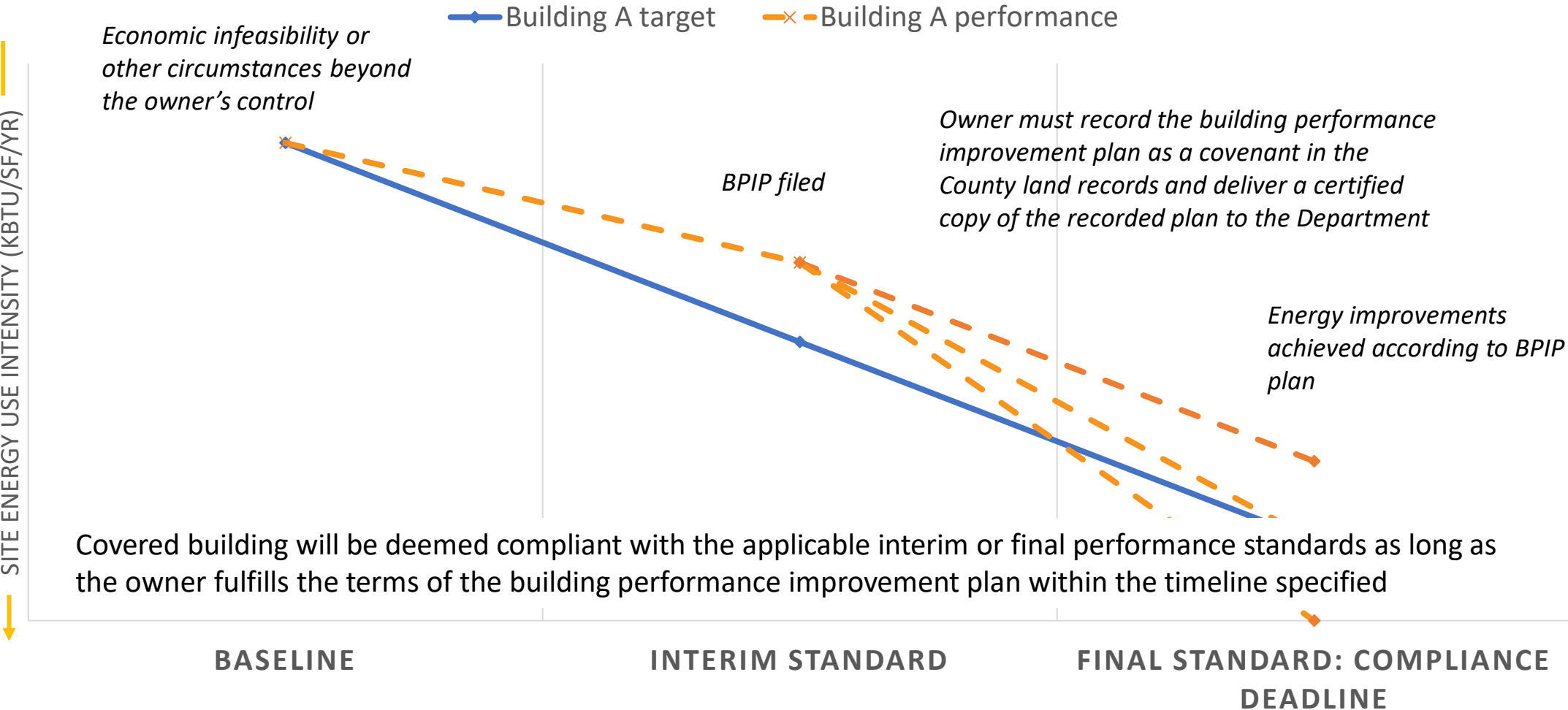
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Technical Guidance:

- Establish format and required documentation for BPIP
- Define cost-effectiveness criteria for savings measures
- Establish process for verifying implementation of improvement measures on agreed-upon timeline

BPIP Basics

NEED FOR BUILDING PERFORMANCE IMPROVEMENT PLAN



Foundation

- BPIPs are not for everyone – there must be some qualifying scenarios whereby a BPIP path is allowed
- Majority of covered properties should comply through the performance pathway
- Reviewing each submission will require significant staff time
- Provides owners flexibility while still obligating them to make significant improvements to their building's performance

Overview: Washington State

Any building can opt to comply via the “investment criteria performance metric.” Process:

- **Conduct an energy audit.** A qualified energy auditor shall conduct an ASHRAE Level 2 energy audit identifying all cost effective energy efficiency measures (EEMs) and by performing the life cycle cost analysis (LCCA) in accordance with the investment criteria.
- **Implement EEMs.** Implement all cost effective EEMs
- **Develop and implement the Energy Management Plan (EMP) and associated Operations and Maintenance program (O&M).** The EMP and O&M are mandatory requirements for all covered commercial buildings.
- **Verify energy savings.** In order to show compliance with the investment criteria performance metric, post implementation energy savings shall meet or exceed 75% of the energy savings projected in the energy audit report.

Overview: Denver

- Denver has alternate compliance options (ACO) for Timeline Adjustment, Electrification Option, 30% EUI Reduction Property Type Adjustment, and Manufacturing/Agricultural/Industrial Designation
- Timeline Adjustment is most like the BPIP. The application for a timeline adjustment for a single building includes:
 - **Online application form** (documenting need) and other documentation that would support the request
 - **Energy audit:** ASHRAE level II audit and all required fields in the Audit Template Tool. The audit template tool requires inventory of all equipment, a list of all energy efficiency measures needed to reach 2030 target, and total project cost and site EUI savings, including total SIR and ROI
 - **O&M Program document:** requires O&M of all equipment, components, and systems to maintain energy efficiency
- After review of the submission, CASR will use the agreed-upon retrofit plan to create a Timeline Adjustment Agreement that is binding as the new performance requirements for the building. The Agreement will include:
 - details of the retrofit plan
 - agreed-upon timeline
 - reporting requirements
 - penalties that would be assessed if the plan is not completed as agreed (usually a higher level than regular compliance because extra time has been approved)

Overview: St. Louis

- If building owners believe that due to unusual circumstances, they will be unable to meet the building energy performance standards established by the City by the deadline or exceptionally burdened by doing so, then they may propose and present an alternative compliance plan for consideration by the Building Energy Improvement Board for approval.
- Properties deemed eligible must complete an ASHRAE level 2 audit or complete a retro-commissioning of the property
- Compliance is achieved through application approval by the Building Division, which becomes a binding agreement between the City and owner.
- If the property fulfills the terms, including installing agreed-upon ECMs or completing its retro-commissioning within the approved timeline, then the property shall be in compliance with BEPS