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SB48 BPS Strategy Report Comments and Recommendations - Technical Policy Design (Institute for Market Transformation)

Additional submitted attachment is included below.

SB48 BPS Strategy Report Comments and Recommendations - Technical Policy Design (Institute for Market Transformation)

May 21st, 2026

To: California Energy Commission
From: Institute for Market Transformation (IMT)
Re: Docket NO. 24-BPS-01

Via Electronic Commenting System

DOCKET NO. 24-BPS-01 RE: California Building Energy Performance Strategy Report

Thank you for the opportunity to comment on the California Building Energy Performance Strategy Report. This document outlines the Institute for Market Transformation's (IMT's) specific BPS strategy recommendations as they pertain to the technical details of BPS: covered buildings, deadlines, performance metrics, alternative compliance pathways, and enforcement mechanisms. IMT is also submitting comments in partnership with several community-based organizations: "Supporting Equitable Building Performance - SB48 BPS Strategy Report Comments and Recommendations". This comment document is focused on community accountability, supporting programs to complement the adoption of BPS, and a discussion of existing residential tenant protections.

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Covered Buildings

We recommend that California's BPS follow the structure of the IMT Model BPS law and that all buildings over 50,000 square feet of gross floor area should be covered, with a few narrow exemptions for certain types of buildings. These exemptions generally should be limited to 1) buildings that are vacant, 2) the process of being demolished, 3) fully renovated, and 4) to certain unusual property types. Our recommendations would mean that BPS would cover close to 50,000 buildings across the state of California, with the majority being clustered in major metropolitan areas. Coop and condominium buildings of that size should be covered, and as such amendments would need to be made to AB802 so that condominiums are required to gather and report benchmarking data.

Addressing Affordable Housing and Community Priority Buildings

Currently, California Energy Commission lists 50,000 buildings covered by AB802. Of these, multifamily buildings represent roughly 12,000 or roughly 25% of the total. The fact that so many multifamily buildings are covered elevates the importance of designing policy in a way that protects against increasing costs for residential tenants while providing pathways to improve this housing alongside the rest of the building stock.

We recommend further analysis of the multifamily market to understand the impact a BPS would have on subsidized and unsubsidized housing stocks, and the support needed to protect affordability. This analysis should include a mapping of covered multifamily buildings across the state and comparing this with variables such as median income, better positioning the state to target the geographical areas where affordable housing is 1) densest, and 2) in need of the greatest level of technical and financial support. Ideally, such analysis would include a segmentation of subsidized and unsubsidized properties. We do not recommend that affordable housing be fully exempted as it is vital that residents of these buildings also realize the benefits of energy efficiency and decarbonization. For the median California household, 1.8% of their income goes towards paying electricity bills. Low-income families ($74,000 for a family of four in 2025) pay around 4.4% of their annual income towards these bills. Thus, these communities stand to benefit the most from a policy that reduces energy consumption, such as a BPS. However, the BPS should consider flexibility mechanisms for buildings that serve frontline communities like multifamily affordable housing properties, such as extending performance deadlines, providing alternative compliance pathways and structuring implementation resources to put affordable housing first in line for assistance. Further analysis on the affordable housing and tenant protections landscape in California is included in the Appendix of our other submitted comment document titled “Supporting Equitable Building Performance - SB48 BPS Strategy Report Comments and Recommendations”.

In addition to multifamily housing, K-12 schools also make up a significant portion of the buildings covered by AB802. Roughly 4,000 buildings of the almost 50,000 covered buildings

are K-12 schools. Many schools rely on bond passage to finance building upgrades. Schools and other community priority buildings covered by the policy should also be prioritized for additional implementation resources or alternative compliance pathways to reflect their unique challenges. As described in our other submitted comment document, county-level Community Accountability Boards (CABs) representing frontline communities should have a leading role in identifying criteria to define "community priority buildings."

Performance Metrics, Targets, and Timelines

BPS laws vary greatly across the 16 locations that have adopted them in the U.S., but all BPS share six key elements. There is a broad range of possibilities and policy design options for California to consider. We explore these in greater detail throughout this document. Five key recommendations to maximize the success of BPS in California:

1. **Adopt IMT's trajectory approach** for BPS target setting.
2. **Adopt both an energy efficiency and an onsite greenhouse gas (GHG) performance metric**. For the efficiency metric, consider the adoption of either normalized site EUI or an hourly or other time-of-use metric. One option would be a total greenhouse gas metric that accounts for hourly GHG variability in grid electricity.
3. **Adopt additional performance metrics to address health, resource, and climate concerns** that are particularly salient in California. We recommend metrics for 1) water use efficiency and 2) indoor air quality (IAQ) and/or ventilation performance.
4. **Consider including a coincident peak demand metric**.
5. **Adopt alternative compliance pathways**. These include short-term extensions, short-term target adjustments, and a Building Performance Action Plan.

Trajectory Approach Policy Structure

IMT's model BPS law centers the trajectory approach because it equitably distributes the level of effort required of building owners while balancing the needs of building owners and implementing governments for certainty and flexibility. This approach is couched in the idea that every building starts from a unique performance baseline, and those that have poorer initial performance should be required to improve more rapidly. Poorer performing buildings use more energy and have more associated GHG emissions; utilizing this policy structure can help governments meet their policy goals while maximizing owners' returns on investments in building improvements. Additionally, the generally low-cost actions that management of poorer performing buildings will be compelled to take early on will substantially reduce energy/emissions, providing the realized savings necessary to invest in more cost-intensive improvements to meet more aggressive targets in future years. In contrast, the management team of a high-performing building needs to dig deeper to make improvements. Additionally, the trajectory approach as recommended here is also generally aligned with the typical asset planning cycle. This matters because building asset cycles can be many years, and it can be difficult to access required capital for improvements outside of these cycles.

Using the trajectory approach involves three stages:

1. Sorting all covered properties into property types and sometimes also climate zones
2. Setting a final performance standard for each property type and each performance metric
3. Calculating each building's individual interim performance standards by drawing a straight line from the building's performance in the baseline year to the final standard for its property type, for each performance standard

Although the final performance standard is the same for covered properties in the same property type, the trajectory to achieve the standard varies for each individual property and reflects the property's baseline performance. Properties must meet their individual interim performance standards at regular intervals to ensure that they make progress toward the final standard. Intervals are often set at five years to align with building owners' typical capital planning cycles. Final standards are set by property type, with individual interim targets drawn from a building's baseline to the final deadline. This approach seeks to allow each building owner to make improvements on a timeline that makes the most sense for its specific property. Governments that have followed this approach include Denver, Maryland, Montgomery County, and West Hollywood; additionally, the implementing agency in Washington D.C. is currently seeking to amend its BPS to follow this structure.

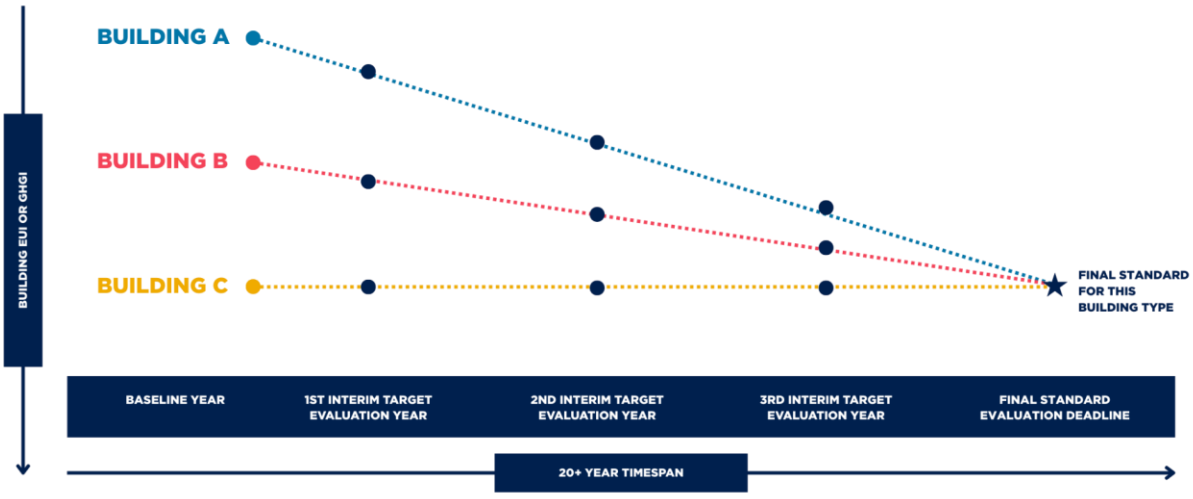

Figure 1. Trajectory Approach

Multiple BPS metrics

While most adopted BPS include only one metric against which building performance is measured, three jurisdictions (Maryland, Evanston, and Vancouver) have taken the best practice of adopting BPS with multiple metrics to holistically deliver on multiple commitments. The IMT Full Model BPS law, IMT Short Model BPS law (well-suited for states) and IMT BPS Implementation Guide include all of the performance metrics recommended below.

We recommend that CEC be the implementing agency for the BPS as a whole and write all rules for all energy-related performance metrics.

Hourly/8760 Greenhouse Gas Emissions or Other Time of Use Metric

CEC should strongly consider incorporating a BPS performance metric that incorporates both onsite GHG emissions and time-dependent emissions from consumption of grid electricity (perhaps calculated based on hourly conversion factors) or another time-sensitive energy metric. While California still has much work to do, it has a head start on the rest of the U.S. in putting in place the infrastructure needed for:

1. utilities to provide real-time and predicted peak electric demand information to building operators,
2. building operators to monitor their usage in real-time, and
3. all large buildings to quickly respond to fluctuations in electric demand and supply.

California could put in place a BPS performance metric that looks at hourly GHGs retrospectively without providing real-time grid data to building operators, but doing so would not maximize behavior change and would be viewed as unfair by many building operators. Instead, we recommend that—prior to implementing an hourly GHG BPS metric or other robust time-sensitive BPS metric—California requires its utilities to put in place the above infrastructure and strongly incentivize building owners to do what is needed for real-time monitoring and response.

Real-time energy monitoring by building operators offers several key advantages:

1. **Immediate feedback and adjustment:** Real-time data allows building managers to see the impact of their actions almost instantaneously. This enables them to make quick adjustments to HVAC settings, lighting, and other energy-consuming operations to reduce emissions.
2. **Enhanced operational efficiency:** By monitoring real-time emissions, building operators can identify inefficiencies or equipment malfunctions that contribute to higher emissions. Addressing these issues promptly can improve overall building efficiency.
3. **Improved occupant engagement:** Providing real-time emissions data to building occupants can increase awareness and encourage behavior changes that contribute to emission reductions. Behavior change is fundamental to all the strategies necessary for CEC to carry out SB 48 implementation. The potential risk of harassment of tenants by landlords to use less energy should be protected against if such a time of use metric was adopted.
4. **Integration with smart building technologies:** Real-time GHG emissions data can be integrated with other smart building technologies, such as automated building management systems and Internet of Things devices. This integration allows for automated adjustments based on emissions data, further optimizing building performance.

From a state perspective, a time-sensitive BPS metric provides additional benefits:

1. **Supporting appropriately timed renewable production and onsite storage**: Any energy or GHG metric that does not account for time of use could exacerbate California's "duck curve". In particular, as discussed below, a net site EUI metric would allow buildings to over-produce during the day to reduce their overall annual net site EUI, even if that electricity is not needed at that time by the grid. An annual GHG metric would also have this problem. An hourly GHG metric would incentivize onsite storage and help mitigate the duck curve.
2. **Leadership and alignment with other climate policies**: California is a national leader on renewable energy and has set aggressive goals for decarbonizing electricity generation. Moreover, many large users are starting to attempt to purchase and use 24/7 carbon-free electricity; these leaders should be rewarded.

No other government has either the level of need to incorporate real-time emissions, or the data needed to make this happen. Incorporating hourly emissions would align California's BPS with other state policies, support the use of onsite energy storage, spur continued investment in clean energy where and *when* it is needed, and position the state as a national leader.

Implementation considerations:

- **Alignment with Portfolio Manager:** ENERGY STAR Portfolio Manager (ESPM) does not support any data with granularity less than 1 day. (This may change in the future but that update is uncertain in both end result and timing.) Currently, hourly emissions would require additional reporting outside of Portfolio Manager. This is not a blocking factor, but may be a reason to phase in hourly GHGs over time.
- **Appropriate targets:** Substantial technical analysis would need to be done to set appropriate standards based on hourly data, especially as building benchmarking data, and other reference data sources used in other BPS approaches, are all annualized. CEC would need to contract or partner to undertake complex analysis on targets–again, not a blocking factor, but perhaps a reason to phase in hourly GHGs over time.
- **Data collection and management:** Implementing real-time GHG emissions monitoring requires robust data collection and management systems. This includes sensors and meters capable of measuring emissions accurately and software platforms that can analyze and visualize the data in real-time.
- **Training and support:** Building operators and facility managers will require training and ongoing support to effectively use hourly and real-time emissions data. This includes understanding how to interpret data, make operational adjustments, and troubleshoot any issues that arise.

Tracking and reporting GHG emissions in real-time and incorporating them into a BPS provides a powerful way to optimize energy use, reduce emissions, and enhance operational efficiency. By offering immediate feedback and supporting dynamic adjustments, real-time monitoring helps building operators and occupants contribute more effectively to state goals. This approach aligns with the growing emphasis on proactive and responsive management of building performance to meet climate objectives.

To date, New York City's Local Law 97 (LL97) is the only one of the 16 existing BPS in the U.S. to incorporate time of use. LL97 merely permits building owners to use hourly rather than annual electricity-to-GHG conversion factors, which few to no owners have so far opted to do. California leads the way in intermittent renewable electricity generation and its consequences, including the duck curve as well as in technology for measuring and warehousing interval utility consumption data. California is positioned to be the first government to implement robust time-of-use components into its BPS.

Ideally, a BPS should include metrics and mechanisms that encourage and credit building owners for shifting electricity use to times when grid power is cleaner and less expensive. This can help optimize building-grid interactions. There are four categories of BPS strategies to accomplish this:

1. **A time-of-use based BPS performance metric** can be used to motivate owners to minimize their electric usage when the grid is most strained and carbon-intensive. Owners should be rewarded for reducing peak demand including through use of technologies like smart controls, thermal storage, and batteries. Usually, it is best for BPS performance metrics to be based purely on performance and not to prescribe technology. One such BPS metric is coincident peak demand (the building's demand during the grid's highest demand hours). It is important to focus on coincident peak and not just an individual building's peak since coincident peak is a much larger driver of cost and reliability challenges. A more advanced metric would also factor in variability in cost and GHG on the supply side to match the intermittent nature of solar and wind power generation. Another possibility is to adapt the CPUC's avoided cost calculator to generate a time-sensitive BPS performance metric.
2. **Greenhouse gas emissions metrics could incorporate time-varying emissions factors** to reflect the fact that the carbon intensity of electricity varies considerably by time of day and season based on the generation mix. This would incentivize owners to shift usage to lower-carbon hours. CEC should use location-specific hourly marginal emissions rates (available in tools like WattTime) for these calculations rather than annual average emissions rates. To effectively use this in a performance metric however, building owners need to be able to access the data in real-time and see estimates ahead of time, so they can make decisions accordingly; a metric that only looks at hourly GHGs retrospectively would be accurate, but would not drive decision making and change.
3. **Aligning building performance incentives and penalties with utility time-of-use rates** would send a price signal to motivate load shifting. To ensure fair assessment across the state, the BPS should use time-sensitive "shadow rates" in cases where local utilities do not yet offer sufficient time-of-use rates.
4. **BPS policies should be designed to work in concert with utility demand response programs**, so buildings get credit for shedding load during peak events when called upon. Two-way data exchange (e.g. via Green Button Connect) between utilities and buildings can facilitate this. CEC has developed significant infrastructure to support implementation of demand flexibility across California, both through development of the

MIDAS database as well as through implementation of appliance standards and common communication protocols. CEC should build upon this infrastructure to ensure that building owners and demand response aggregators have the tools and information necessary to modify the load used at their buildings in response to a TOU-based BPS standard.

CEC will need to ensure buildings have adequate metering and information technology infrastructure and work with utilities on data access to implement these load-shifting aspects of a BPS. IMT and RAP worked with dozens of stakeholders to write a model utility data access law for use by all 50 states. It goes beyond and complements AB802's provision of whole building data access for building owners. CEC should evaluate the efforts of the existing Energy Data Access Committee, and identify any gaps that would inhibit the ability to develop a BPS standard based on data access. CEC should make recommendations to agencies and/or the legislature for how to improve data access to support BPS implementation.

Strategically incorporating load flexibility into BPS is key to supporting the transition to a clean, reliable, affordable grid. IMT's BPS implementation guide recommends a gradual, phased approach, as these elements are more complex than basic energy and emissions metrics. Because the adjustment to using time-of-use GHGs or coincident peak demand would take time (and because ENERGY STAR Portfolio Manager does not yet incorporate data at granularities less than one day), it may be necessary to phase these elements into the policy. This might mean starting with them as optional alternative compliance measures (as in NYC), with a clear timeline to shifting to mandatory time of use/emissions performance standards.

We recommend against adjusting greenhouse gas emissions to reflect the purchase of renewable energy certificates, virtual power purchase agreements, or the purchase of other offsite green attributes especially if they do not account for the hour of generation. This is for the following reasons:

1. Doing so adds complexity and uncertainty for both the implementing government and building owners.
2. Doing so may result in owners simply procuring offsite renewables and neglecting opportunities to improve their buildings.
3. Energy efficiency can alleviate grid constraints and lower overall energy costs; neglecting efficiency may threaten broader policy goals like electrification.
4. Offsite renewables are less likely to create jobs in California if they are generated out of state, and so can create a flow of capital out of the community.
5. Offsite renewables do not improve the comfort, indoor environmental quality, or building safety for occupants.
6. Offsite renewables may not reduce energy bills for energy-burdened tenants.
7. Offsite renewables do not improve property values.
8. Building owners and occupants rightly prefer to be held accountable for what they can control, and they cannot control the rules, availability, and prices of offsite renewables.

9. The Greenhouse Gas Protocol requires governments to report location-based emissions, which are unaffected by renewable energy purchased from beyond California's borders.
10. Renewable portfolio standards (RPS), utility rate design, and other utility regulations are more effective means of driving construction of offsite renewables.
11. As the grid decarbonizes, it will be increasingly important to focus on the time of energy use and generation. Adopting long-term renewable regulations that are not 24/7 would lock a government on the wrong path to achieve ambitious climate commitments.

Potential Short-Term Metrics for Use Prior to Using a Time-Sensitive Metric

Even in California, the metering, information technology, and utility infrastructure are not yet fully in place to support building owners in receiving and responding to time-of-use signals. If that remains the case when California adopts a BPS, then the BPS could initially use a combination of 1) normalized site EUI and 2) an Onsite + District Greenhouse Gas emissions metric using fixed, annual GHG conversion factors.

Normalized Site EUI

Normalized Site energy use intensity (EUI) has been the performance metric most frequently included in recently adopted BPS laws. It requires buildings to improve their efficiency. Because it does not apply a site-to-source multiplier to electricity usage, site EUI gives a boost to beneficial electrification without excessively encouraging inefficient electrification.

Adjusting final performance standards for climate zones may or may not be necessary to some extent. ESPM does normalize EUI (but not emissions) for weather, and does so based on local weather stations, not climate zones; local weather stations are far more granular. Some variation in final performance standards by climate zone may be important for equity and for palatability. However, it is not clear that all 16 climate zones used in the California state code need to be addressed—and the granularity of these zones could complicate implementation. We recommend CEC undertake an analysis of variation in energy use in existing buildings by climate zone, and use the minimum number of different standards needed (e.g., several of the 16 CA zones could share the same standard, or the ASHRAE climate zones could be used instead). In addition, some climate zones may have few or no buildings subject to the BPS, and thus may not need unique standards.

We recommend CEC conduct analysis to see if building vintage is an issue that needs to be addressed, though we doubt it. No jurisdiction has yet adjusted its BPS for building vintage, and studies have shown little to no correlation between building age and performance among large buildings. However, given the stringency of Title 24, different standards for new buildings may be appropriate, and the possibility should be explored.

In deciding whether and how to normalize EUI for operating characteristics, IMT recommends following "EPA Recommended Metrics and Normalization Methods for Use in State and Local Building Performance Standards." Determining if and how to normalize site EUI to account for operating characteristics is a complex decision. For each building type, it is important to weigh the value of normalization against the added complexity that it entails. In many cases, normalization for operating characteristics may not be necessary, and therefore doesn't warrant the added complexity. This will be the case for building types whose operating characteristics don't vary widely and/or don't significantly impact the energy use of the building. An example might be police or fire stations. These buildings typically operate 24 hours a day, 7 days a week, making operating hours irrelevant in assessing energy use.

BPS should be designed and implemented such that there is no option for buildings to use renewable energy procurement as an alternative for bold action on energy efficiency, electrification, and demand management. Under ESPM rules, site EUI is not impacted by onsite or offsite renewable energy. This approach ensures that the BPS will incentivize owners to improve actual building performance, which is critical to achieving climate commitments and will often create local jobs. The easiest and usually best option for governments is to stay aligned with ESPM by using ESPM site EUIs in their BPS and using means other than BPS to incent renewables (e.g. RPS with local carve outs, subsidies, and utility tariff design). For several reasons laid out in its statement, EPA strongly recommends that governments align with ESPM rather than using "net site EUI". IMT agrees in general and in this case. In California, absent some other metric to encourage appropriately *timed* renewable energy generation and use, a net Site EUI metric will only exacerbate the duck curve.

Onsite and District Thermal GHG Emissions

An onsite and district thermal greenhouse gas (GHG) emissions metric is intended to reduce and ultimately eliminate fossil fuel use in buildings and district energy systems. It does not include GHG from the consumption of electricity generated off site. This metric complements an EUI metric by sending a strong and unambiguous message to move away from local fossil fuel use. Use of both performance metrics is aligned with the aggressive climate targets of influential groups such as California State University. IMT generally recommends against using an onsite emissions metric without safeguards against significant inefficient electrification (like installing electric resistance heat) as doing so will frequently aggravate the split incentive problem, and result in increased energy burden on residential tenants. One safeguard against inefficient electrification is building into the BPS a second performance metric, like site energy use intensity, to incent efficiency. See IMT's BPS Housing Affordability policy brief for further discussion of the effects that inefficient electrification would have on residential energy burden.

Significant GHG emissions result from the extraction, processing and distribution ("upstream emissions") of fossil fuels including gas, fuel oil, and propane. The largest component of these emissions is the release of uncombusted gas into the atmosphere. The main component of "natural" gas is methane, which has a global warming potential 30 times higher than carbon dioxide (CO_2) over 100 years and 83 times higher over

20 years. Failure to account for upstream emissions would significantly undercount the global warming impact of fuel consumption.

CEC should strongly consider factoring in upstream GHG emissions by weighing the benefits and costs. Accounting for upstream GHG emissions will add some complexity, and require calculations outside of ESPM, but will more accurately reflect buildings' true climate impact and better align with climate realities the BPS law sends to building owners. The carbon dioxide equivalent (CO2e) from upstream emissions can be added to the CO2e from all other sources to calculate each building's total onsite and district emissions. Ideally, CEC will incorporate estimates to account for all upstream emissions. CEC should multiply estimated gas leakage by Global Warming Potential to convert it into CO2e. CEC can calculate buildings' onsite emissions by capturing the buildings' weather normalized fuel use from ESPM, multiplying it by factors that account for both combustion emissions and upstream emissions, to convert it to total onsite emissions as measured in CO2e. For buildings served by a district energy system, CEC should also add the emissions resulting from buildings' share of the system's fuel use, applying the same combustion and the same or similar upstream emissions factors. Most California buildings' only source of onsite emissions will be their consumption of gas. CEC will have to perform the above calculations outside of ESPM (preferably in an automated process) because ESPM does not account for upstream emissions or district energy in their calculation of "direct emissions."

If CEC has reliable gas leakage estimates for its gas utilities, then those estimates should be used to estimate leakage attributable to each therm of consumed gas. Where such estimates are not available, the Gas Index is one potential source for regional gas leakage data. CEC should update gas leakage rate estimates as new reliable data becomes available. Doing so will incent gas utilities to measure and reduce their leakage rates. CEC should recognize that utility gas leakage is outside of building owner control. This makes it crucial for CEC to consult with owners, and consider giving owners one or more years of notice before updating leakage rates.

Some governments may have existing utility policies that allow users to purchase biogas, also known as "renewable natural gas (RNG)." When purchased through the gas grid, this RNG is conceptually similar to "green power" or REC purchases. IMT strongly recommends against California designing BPS to treat RNG differently than other gas—and no U.S. jurisdiction has done so in their BPS. Doing so poses many of the same risks as does treating offsite renewable electricity differently from other electricity. As far as IMT knows, in every government that has studied RNG, the total potential recoverable RNG in the region is a tiny fraction of the gas currently being consumed. Thus, this RNG should be reserved for its highest and best use: manufacturing, high temperature applications, and other processes for which substituting alternatives to gas is more difficult than in buildings. Lastly, ESPM does not allow reporting of RNG use, which adds to the burden that special treatment of RNG would place on CEC and building owners.

For district energy systems, IMT recommends using system-specific GHG factors that account for the fuel(s) used in the district energy system, and the total efficiency of the system from

energy sourcing to delivery to a building. District energy systems can vary wildly in their emissions intensity. These differences are a result of: the energy source(s) used; the energy delivery medium, such as steam, high-temperature hot water, low temperature hot water, etc.; whether the system is a cogeneration system; whether the system has heat recovery; and uses ground or water energy storage. Because ESPM is designed to apply national factors, its GHG assumptions for district energy are based on national averages, and average the efficiency of cogeneration and non-cogeneration systems. This approach does not encourage the decarbonization of local district energy systems, as buildings are unable to claim the benefits of emissions reductions of local plant operators. For this reason, IMT does not recommend using generic emission factors for district energy. Other governments with any significant district energy presence have set local or system-specific factors for district energy (NYC, Boston, Maryland, Vancouver).

In many cases, the best, least difficult, most effective, and least expensive means of decarbonizing buildings served by district energy systems will be to decarbonize those district systems rather than the alternative: each owner electrifying each of its buildings served by the systems. As part of the process of developing California's BPS, CEC should convene the operators of the district energy systems that serve the community and the systems' customers to devise a plan for decarbonizing the systems. The investment to make these upgrades will typically have to come from the systems' customers (directly or indirectly through increased district energy prices). In many cases, these investments will be accomplished by customers signing or amending long-term contracts with the district systems. A BPS is a uniquely powerful tool to align the incentives of district energy systems and their customers and to provide the urgency needed to drive collective action among many building owners to finance major investments to decarbonize district systems. Using system-specific GHG factors engages the system operator as a partner in decarbonization, and ensures that campuses and multi-user DE systems get equal credit. Appendix E of the IMT BPS Implementation Guide includes detailed recommendations for district energy emissions, including how to handle co-generation systems.

Water Use

Given California's current and projected vulnerability to drought, CEC should adopt a water use performance metric. Water use in buildings also has implications for the state's greenhouse gas emissions, as utility water usage consumes energy and indirectly generates GHG emissions, although these impacts vary greatly among water and wastewater systems.

The IMT Model BPS law defines "water use" as "the total gallons of water used annually inside or outside of buildings by a covered property." IMT recommends CEC set a single metric for the total water used both indoors and outdoors, because few buildings meter outdoor water use separately, and requiring buildings to meter separately would entail significant costs that may not be justified by the benefits. CEC should consider setting a single final standard calculated by summing two distinct water budgets: one for total (not per square foot) indoor water consumption and one for total (not per square foot) outdoor water consumption, to reflect the different environmental and occupant needs of those sources of water demand.

As with other performance standards, we recommend that interim water intensity standards are set using the trajectory approach. As AB802 does not currently require the reporting of water use in covered buildings, CEC may wish to delay the adoption and implementation of any water intensity targets until at least two or three years of data has been gathered. A water budget per square foot of gross floor area should be set for each building typology, relying on local building benchmarking data, when available. In most cases, the indoor budget will need to be set as gallons of water per year per square foot multiplied by total building square footage. The lowest water consuming quartile or decile for a typology can be used as a starting place for setting the final indoor performance standard. CEC should follow the process EPA lays out for site EUI to determine whether it is appropriate to account for one or more operating characteristics when setting each building's final water performance standard. Only multifamily buildings are eligible for EPA's 1-100 Water Score, and so CEC has the option to use a modified version of EPA's ENERGY STAR Score Normalization Method for multifamily buildings but for no other property type. EPA's Water Score uses historic weather factors and does not adjust year to year to normalize for observed weather.

For outdoor water consumption, CEC may seek to establish more ambitious final performance standards. One recommended option for CEC to consider is setting a final performance standard for outdoor fresh water consumption at zero gallons per year. In theory, zero is a reasonable, achievable goal when local, climate-appropriate vegetation is used and efficient mechanisms such as rainwater capture and storage are utilized. Such vegetation is adapted to survive California summers where, depending on the climate zone, no precipitation at all may be the norm rather than an actual drought. See the California Department of Water Resources' Model Water Efficient Landscape Ordinance for further best practices in setting water budgets for landscaping.

Water use intensity standards should be adjusted to reflect changes in the square footage of landscaped area or building area. Increases in impervious surface areas (e.g. due to replacing parking with vegetation) should result in increases to a property's performance standard. Decreases in impervious surface areas should result in proportional decrease to performance standards. To calculate how much to increase the standards, a consumption per square foot representing current best practice for landscaping and for each property type should be set for the baseline year. The actual adjustment will depend on when the landscaping change or construction occurs, by using the trajectory approach to draw a straight line from the baseline performance to the final performance standard.

Ventilation and Indoor Air Quality

Addressing indoor air quality problems is a critical priority for many communities, particularly Justice40 communities that have already been overburdened with pollution, poor outdoor air quality, and underinvestment in the building stock. For California, specifically, the increasingly intense and prolonged wildfire season makes reliable access to safe indoor air crucial for the health of the entire population. Initially, IMT recommends that CEC use carbon dioxide concentration as the sole performance metric for indoor air quality. While there are many pollutants that impact indoor air quality, the technology to measure carbon dioxide is widely

available and relatively inexpensive, and carbon dioxide serves as a good overall indicator of how much outside air reaches occupants—a critical factor in reducing the spread of airborne illness and exposure to pollutants.

With the growing realization of the central role that indoor air quality and ventilation play in reducing the spread of contagious respiratory diseases, the case for regulating indoor air quality is stronger than ever before. Urgent action is needed to protect public health, yet most owners have never measured the carbon dioxide concentrations in their buildings; moreover, many markets have a limited workforce trained to evaluate ventilation system performance and the relationship to IAQ. The IMT Model BPS law balances urgency with owner and industry needs by phasing in more rigorous, performance-based requirements to give industry time to plan for and transition to new requirements.

In 2021, IMT and International WELL Building Institute published a Building Performance Standard Module: Ventilation and Indoor Air Quality Policy Brief. The brief lays out in greater detail the case for a BPS to address IAQ. It discusses the mechanics of how to do so, including detailed recommendations regarding how governments can gradually strengthen IAQ requirements by adding in performance requirements for additional air pollutants. The brief also provides links to useful technical resources. IMT recommends that CEC works with communities to understand their priorities as it relates to IAQ and to set high-level IAQ goals. To deliver on these goals, CEC should formally or informally convene volunteer IAQ experts to develop rules, schedules, and training materials. CEC should also consider hiring an IAQ expert to staff the volunteer process and to lead in production of deliverables.

IAQ is the only performance metric in the IMT Model BPS law for which IMT does not recommend use of the trajectory approach. Instead, IMT recommends that CEC work with their communities and experts to set a single unchanging maximum carbon dioxide concentration. Based on available research, IMT's default recommendation of 1,000 parts per million is protective of public health while being relatively inexpensive for most buildings to achieve.

CEC will need to provide detailed rules for how and where to sample indoor air to demonstrate compliance. They will need to set separate sampling and testing rules for continuous monitoring and third-party performance tests. CEC should look to building certifications like RESET Air as a starting point for developing these rules. CEC should work with experts and stakeholders to strike a balance of protecting public health while minimizing costs and paperwork and assuring that the expert workforce serving buildings in California has, or will have, adequate capacity to enable buildings to comply. Johns Hopkins has created a Model State Indoor Air Quality Act that we recommend CEC use for reference.

Providing Flexibility for Buildings: Alternative Compliance Pathways

To ensure BPS policies actually work in the real world, it is essential to maximize affordability, practicality, and flexibility. IMT recommends the inclusion of alternative compliance pathways (ACPs) to address this need for flexibility. ACPs provide options to owners when meeting a standard BPS target is infeasible, while still driving energy reductions and improvements. This is especially important to allow buildings to align needed upgrades with existing capital improvement schedules and provide additional time for capital or capacity-constrained buildings.

IMT is currently completing an updated framework for ACPs that builds on lessons learned from other jurisdictions and discussion with a working group of experts over several months. We recommend that a state-level BPS aligns with this framework as it reflects best practices for ACPs. Through this review of existing ACPs, discussion with governments, and coordination with experts in this space, it became clear that a mix of pathways was needed to adequately address different building needs. We recommend inclusion of three major pathways:

1. **Simple time extensions**: Includes (1) a short-term extension available for all buildings, either annually renewable, or for up to [3] years, depending on the circumstances. Qualifying circumstances include items such as financial distress, majority vacancy, lease turnover, renovation, change in ownership or property type, construction delays, historical building status, or affordable housing financing schedules.
2. **Percent reduction:** Provides the option to reduce weather-normalized site energy use intensity by 20% over 5 years rather than meeting the standard target. Limited to use in one to two compliance cycles.
3. **Building Performance Action Plan (BPAP):** Offers the most flexibility and includes options for 1) setting interim custom targets, 2) an extension to the final target timeline, 3) setting a custom final target, or 4) creating a campus master plan. An approved BPAP constitutes a binding agreement between the owner and CEC. This option should be constrained to those with exceptional circumstances, such as extreme financial hardship, technical infeasibility, or long-term lease restrictions. This is important because a) reviewing BPAPs requires more administrative staff time, and b) the flexibility provided impacts buildings meeting climate goals on time. We recommend review and approval of these plans as a decision-making process that is integrated into any regional CABs. Various BPAP scenarios are shown in the figure below.

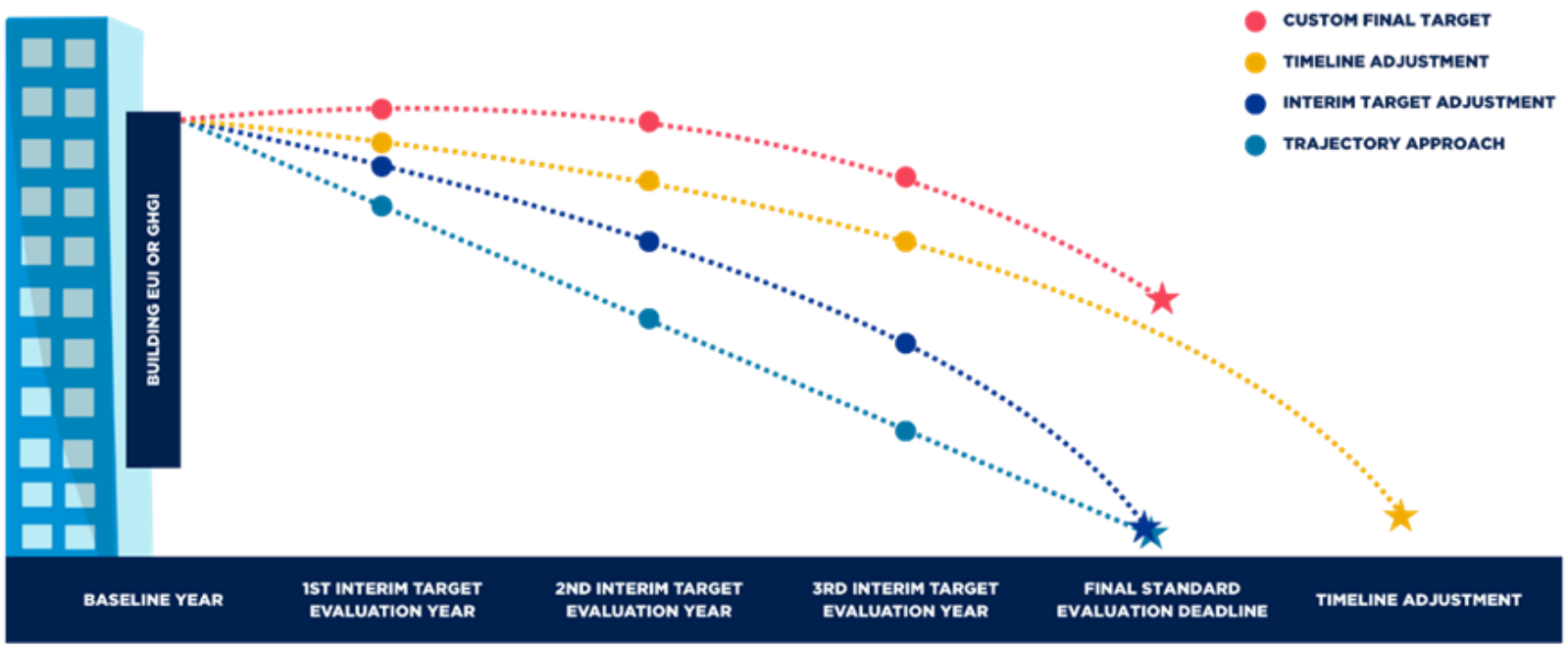

Figure 2. BPAP Scenarios

It's important to consider affordable housing and other community priority buildings explicitly when designing these pathways. The three pathways include eligibility reasons that specifically mention affordable housing. However, a specialized alternative compliance pathway for this sector may also be warranted. In particular, this may include a long-term extension to align with refinancing cycles for subsidized housing in particular that requires a lighter touch or more streamlined BPAP process along with it. Affordable housing should be top priority for receiving assistance with preparing and submitting any ACP applications.

Several existing BPS laws use simple payback to determine which measures need to be installed under an ACP and included in the application for those ACPs. IMT strongly recommends against using simple payback in BPS. Relying on simple payback only captures the time required to recover initial capital costs. Thus, simple payback ignores the full lifecycle value, risk, and timing of investments. It also systematically undervalues long-lived measures such as envelope improvements, electrification, or system integration that yield deeper emissions reductions and typically require larger initial investments. Simple payback also often fails to incorporate avoided compliance penalties, incentive structures, or rising fuel and carbon costs, all of which are central to long-term financial decision-making under a BPS framework.

In the context of a BPS, net present value, evaluated through the lens of total cost of ownership, is the recommended and best practice financial analysis metric. IMT recommends that cost-effectiveness informs the "how" of compliance by guiding strategic sequencing and investment timing. However, it should not define whether or not a building owner is in compliance or, in most cases, if the owner should be required to demonstrate eligibility for a BPAP.

BPS Enforcement: Payment in Lieu of Performance

We recommend that CEC use the term "payment in lieu of performance" rather than "fines" or "penalties" because many commercial lease agreements do not allow building owners to pass them through to commercial tenants. The ability to pass through helps align the incentives of both commercial tenants and building owners. This consideration does not apply to multifamily leases because the term used has no bearing on an owner's ability to pass costs through to residential tenants. Note that small under-resourced commercial tenants often provide critical services to frontline communities and are often economically vulnerable; resources and policies should be put in place to aid and protect these tenants. See the green leasing section in our other comment document: "Supporting Equitable Building Performance - SB48 BPS Strategy Report Comments and Recommendations on Community Accountability, Support Programs, and Housing Affordability".

Payments should be set high enough to create a strong incentive for covered properties to comply through improved performance, while not creating undue burden that may impact an owner's ability to operate. At the same time, payment in lieu of performance should reflect both the magnitude and the duration of non-compliance so that those who are close to achieving compliance or are only marginally late in doing so, are required to make relatively lower payments. The first factor that should determine a payment in lieu of performance is the

property's actual performance relative to the performance target, with payment in lieu of performance increasing with the gap between the two. So, payment in lieu of performance would be higher for missing a target badly, and properties that narrowly miss their targets would incur lower payment in lieu of performance. This should be the case regardless of the performance metrics used. Similarly, the payment in lieu of performance should reflect the duration of non-compliance: the longer a property is out of compliance, the higher the payment in lieu of performance should be. Lastly, if the BPS has multiple performance metrics—such as energy and water consumption, or carbon and air quality—each payment in lieu of performance should be calculated separately, with the owner responsible for paying the total of all of the payment in lieu of performance.

Payments in lieu of performance should be paid into a non-lapsing BPS fund, established through BPS legislation, adopted by the legislature. All funds deposited into the BPS fund, and any interest earned on the funds, should not revert to the unrestricted fund balance of the General Fund at the end of a fiscal year, or at any other time. The monies in this fund should be continually available without regard to any fiscal year limitation, and we discuss further in our other submitted comment document how community accountability and ownership of the administration of these funds should be prioritized. The intent of this is to ease the burden of compliance for properties such as affordable multifamily buildings located in areas with a concentration of low-income, or minority residents, that have experienced a historical lack of public and private investment.

Other Fines and Fees

We recommend that California Energy Commission account for an owner's resources when issuing enforcement fees, fines, and payment in lieu of performance. While it is difficult to determine every owner's ability to pay a fine, one potential approach is to use a property's assessed value as a proxy for the financial status of its owner. While the relationship between a building's assessed property value and its owner's ability to pay is not direct, the correlation is strong enough that, in most cases, the enforcement amount for non-compliant owners will reflect their financial situation better than if their properties' assessed values were not considered. One approach to do so is to scale the enforcement amount depending on the assessed property value of the non-compliant building. The payment in lieu of performance should be the primary enforcement mechanism for BPS. In practice though, there may be owners that refuse to comply with BPS either through meeting the standards or paying the payment in lieu of performance. Ideally, these situations will be very rare, but CEC should possess the authority and willingness to administer serious consequences for such cases. Consequences may include severe fines or penalties beyond the limits of the payment in lieu of performance. CEC must be willing to pursue these penalties through requisite legal processes, which may need to be streamlined. In some cases, a sister agency like the Attorney General will be responsible for enforcing such penalties.