DOCKETED	
Docket Number:	24-BPS-01
Project Title:	Building Energy Performance Strategy Report
TN #:	257449
Document Title:	Jeetika Malik Comments - Lawrence Berkeley National Lab Comments-Building Energy Performance Strategy Report
Description:	N/A
Filer:	System
Organization:	Jeetika Malik
Submitter Role:	Public Agency
Submission Date:	6/26/2024 4:40:14 PM
Docketed Date:	6/26/2024

Comment Received From: Jeetika Malik
Submitted On: 6/26/2024
Docket Number: 24-BPS-01

Lawrence Berkeley National Lab Comments-Building Energy Performance Strategy Report

Additional submitted attachment is included below.

Subject: Lawrence Berkeley National Laboratory's (LBNL) Input on the California Building Energy Performance Strategy Report

Date: 06/26/2024

1. Please provide the following information about you and/or your organization:
1.1. Names & email addresses of public contacts for you and your organization.
Joshua Kace (jkace@lbl.gov), Lawrence Berkeley National Laboratory (LBNL)

1.2. What are your areas of interest in this report development process?
Given LBNL's engagement in technical analysis to support building performance standards and policies (DOE) and managing CalFlexHub for developing, testing, and demonstrating demand-flexible technologies and solutions that enable demand-side energy resources (CEC), we are interested in providing insights to help support the development of this report.

2. What building performance metrics (such as site energy use intensity, carbon dioxide equivalent emissions, or peak electric demand) should be considered in a building performance strategy? What building performance metrics could be used to trigger building-level interventions (such as enforcement, incentives, etc.)?

Metrics need to be considered based on several factors, including the goals of the broader policy and grid constraints. Building Performance Standards are typically used to drive 1) Energy Efficiency and 2) Electrification of on-site fuel consumption. Site EUI and Direct GHG Emissions (i.e. - emissions derived from on-site fuel use), respectively, are most considered. This also aligns with the EPA's recommendation for jurisdictions considering a dual metric policy.

One drawback of combining these metrics is that electrification projects will also typically reduce Site EUI, creating some overlap in the intervention strategies for each metric (Source EUI, for example, would have less overlap in intervention strategies). This overlap yields slightly less precise regulatory control over whether a building owner decides to electrify or implement efficiency. Site EUI, however, is a much more intuitive metric to building owners, which in our experience outweighs this drawback.

The addition of complementary metrics for peak demand, resilience, and functionality should be considered with close attention to how a building owner will navigate potential competing priorities. Optimizing a building's performance and retrofit strategy for a dual metric policy alone is a complex process, and adding additional metrics should be done with this in mind. As an example, a functionality evaluation could be implemented as a periodically evaluated prerequisite, to ensure a building is delivering on its requirements for intended use. This creates a staged process for the building owner that should maximize success and compliance rates.

Other metrics may be better implemented as prescriptive adjustments to targets. As a rough example, an all-electric building that may struggle to hit a Site EUI target could be granted an adjustment based on the ability to reduce the building's current peak load, implement DR/load

shifting, etc. This opens the door for another building to implement electrification while maintaining a constant peak load across both buildings.

3. What building-specific conditions and circumstances (such as vintage, climate zone, orientation, etc.) should be included in a building performance strategy?

When incorporating building-specific conditions and circumstances into a robust building performance strategy, it is important to develop a sophisticated approach without being unnecessarily complex. Sophistication is important for an equitable and flexible policy that emphasizes successful compliance over non-compliance fees. Too much complexity, however, will lead to market confusion and additional resource burdens on the implementing agency for enforcement and tracking of the ordinance.

Climate zone is a critical dimension, as this has a direct correlation to all typical existing and target performance indicators. Electrification investments will also vary significantly based on climate, as space heating is typically the most difficult end-use to fully electrify.

Building vintage + orientation can sometimes be correlated to existing performance metrics, but our experience has shown this to be inconsistent. No BPS policies that we are aware of take these conditions into account.

The operating, and functional requirements of the buildings should be considered. A building's operating hours, comfort conditions/requirements, and specialized end-uses (e.g. Server Closets, Data Centers, specialty office equipment, TV studios, etc.) are all factors that greatly affect a building's energy performance. Just as important would be the inverse concept – buildings that today may not be providing adequate comfort conditions (e.g. - lodging units without AC or comfort control, poor ventilation) can manifest in benchmarking data as 'good energy performers'. Building a strategy that does not penalize improved functional requirements at an asset is ideal for supporting both climate goals alongside occupant health and wellness.

4. How should building benchmarking data be used to prioritize building upgrades and incentives?

The extent to which benchmarking data can be used to inform interventions at buildings is highly dependent on the granularity and quality of the available data. Existing benchmarking policies and associated datasets are a great way to help establish a realistic, empirical baseline for energy/environmental performance of different asset types across different climate zones, and can also be more politically palatable than nationally-set target schemes.

Benchmarking data is also critical for setting manageable interim targets for buildings. Existing benchmarking datasets don't just tell you the median/average energy performance, they also quantify the spread/deviation in energy performance. When setting a target by building type, understanding the spread/deviation informs the specific number of buildings that need to take action, and how much savings need to be achieved. This has implications not just for the

buildings, but for the entire industry to be built around decarbonization planning, equipment (i.e. heat pumps), and installers. The lowest-performing buildings should be emphasized in initial compliance periods, setting interim targets that are aggressive but achievable, and allow the industry to build up over time.

It is also important to consider every step of the BPS process as a data collection opportunity to further support building owners over time. Energy audit requirements, decarbonization planning requirements, and retro-commissioning services are all potential initial steps in a BPS policy that, if structured appropriately, can yield extremely valuable information about the existing state of systems/equipment/characteristics that can help inform future support needs/incentives/training for building owners.

5. What types of support and resources would be necessary to help building owners meet building performance targets?

First, it is important to understand that many building owners are not experts in building energy and environmental performance. While it is expected that vendors/consultants would play a critical role in any BPS life cycle, many building owners may struggle to understand the first steps towards compliance and could potentially be vulnerable to predatory vendor practices. Strong investment/incentives should be considered in initial scoping-related work, from direct expert support to building owners looking to navigate the process, to general training/resources made publicly available to all building owners. Consideration should also be given to buildings/building owners that have been historically underserved by the energy efficiency/decarbonization industry. The Energize Denver program is a great example of both general resource support and targeted additional support for 'equity-priority' buildings.

We highly recommend that existing building commissioning services (EBCx) such as building tune-ups and retro-commissioning be emphasized as an important first step towards BPS scoping and compliance. Many buildings can achieve significant energy savings with minimal investment, driving initial success stories and possibly bringing an entire new tranche of buildings into compliance. Other buildings may have broken equipment, poor ventilation, and other nascent issues that put a building into a 'false sense of security' because of an inflated energy score.

Beyond that, financial incentives and financing mechanisms play a critical role in long-term decarbonization roadmaps for electrification and deep energy retrofit projects. Rising interest rates/cap rates nationally have super-charged the need for financing mechanisms across real estate.

8. Given the time and location dependence of both the cost and greenhouse gas emissions of electricity, how can building performance strategies be structured to incorporate load flexibility benefits?

The correlation between electricity bill savings and GHG emission reduction will increase over time. Currently most business customers in CA are on TOU rates which incentivizes using less energy during CAISO peak period 4-9pm, which promotes load flexibility (LF) to an extent. In

addition, LF will also help reduce demand charges which is typically a large portion of business customers' electricity bills. Therefore, a simple near-term strategy could be using a percentile (similar to EnergyStar Portfolio Manager) of annual electricity bill per square-foot compared to similar building types as the proxy metric to align with customers' natural interest in reducing operational costs. An alternative compliance option could be opted into an hourly dynamic retail electricity rate with their local utility as opposed to TOU. For jurisdictions that are more ambitious about decarbonization and more experience with sophisticated analysis and accounting, 8760 carbon emission calculated from one-year interval load data could be another option.

12. Please submit any additional comments, issues, references, models, recommendations, or other information that you believe is relevant to the development of the California Building Energy Performance Strategy Report.

We encourage CEC to strongly consider sufficiency (or deep energy conservation) approaches alongside energy efficiency to evaluate the building energy performance for sharply reducing GHG emissions. This recommendation is motivated by three critical reasons 1) risk mitigation of missing the state's climate targets by 2045 and mitigation of other key societal risks, 2) to enable greater equity and energy system resilience, and 3) for its focus on well-being while providing the best chance for a stable and livable planet.

LBNL (along with UC Berkeley and UCLA) organized a day-long workshop on May 20, 2024, to brainstorm and develop an actionable research and development plan for integrating sufficiency with California's existing housing-related programs such as building codes and standards. Some of the consumption-based metrics identified from the workshop include energy use per person, capping energy and GHG consumption above an area threshold, and/or increasing energy efficiency requirements for larger buildings or housing units. The workshop participants also discussed new policies toward incentives for adaptive reuse and demand reduction as well as reviewing existing ones for cost drivers and material use. The output of this workshop - a brief scoping whitepaper that will help to define specific R&D that can help California meet climate, equity, and other core goals is expected to be released in the fall of 2024.

References for sufficiency:

1. LBNL Workshop website: https://energyanalysis.lbl.gov/energy-sufficiency-workshop
2. Malik J., Hong T., Wei M., Rotmann S.; 2024. "Prioritize energy sufficiency for decarbonizing buildings". Nature Human Behaviour. doi.org/10.1038/s41562-023-01752-0