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Passive House California support for CEC Action on Decarbonization

Position statement and comments attached.

Additional submitted attachment is included below.



May 7th, 2019

California Energy Commission
1516 Ninth Street, MS-29
Sacramento, CA 95814-5512

RE: 2019 California Energy Efficiency & Building Decarbonization Action Plan
Docket #: [19-IEPR-06](#)

Position Statement:

California must rapidly increase the number of housing units being built across our State in order to address our current housing crisis for both affordable and market rate housing. We must simultaneously rapidly decarbonize both new and existing housing stock to ensure that we meet the climate emissions targets required to avert climate catastrophe. In order to achieve both an increase in housing units and a significant reduction in carbon emissions from buildings, **our buildings must specifically target the low space heating performance targets that align with those set by the international Passive House standards** for both new and retrofit buildings.

Based on a [Reach Code Study recently submitted by Passive House California to the CEC's Codes and Standards Commission](#), we believe that meeting Passive House performance levels for multifamily buildings is **readily attainable and affordable** in all of California's most populous climate zones. Our PHCA study found that by meeting the Passive House standard's infiltration targets and by installing heat recovery ventilation, code compliant low-rise multifamily buildings could attain similar energy efficiency levels to those seeking Passive House certification.

PHCA members and supporters have learned from our [ten year's experience building Passive House projects across most climate zones here in California](#), that our industry is already capable of delivering projects that meet these rigorous performance metrics. We have furthermore experienced that these buildings provide added resilience in a changing climate, where heat storms and prolonged fire seasons disproportionately affect our most vulnerable

citizens. Our PHCA Reach Code study showed us that it is **much easier and more cost-effective for multifamily buildings to meet Passive House performance targets**. They additionally increase materials resource efficiency, by requiring less insulation than is needed for small, single family buildings. Multifamily buildings further increase density and allow transit options to become more economically viable. This in turn, reduces traffic and carbon emissions from single occupancy vehicle travel.

PHCA therefore supports the adoption of alternate prescriptive Passive House pathway for multifamily buildings. We believe that by bringing larger buildings in line with the comfort, energy, and resiliency targets attained by those designed to the Passive House standard, we will ensure the following:

1. We have a chance to [avert climate catastrophe for our children's future](#), while still providing more housing to accommodate a growing population
2. The [low operational costs required to heat and cool these buildings will provide economic stability](#) for our most vulnerable citizens,
3. Reduced infiltration and filtered, recovery ventilation will ensure protection from [poor outdoor air quality disproportionately found in disadvantaged communities](#)
4. Our building stock can more easily be powered by [an emissions-free, all renewable source energy grid when renewable energy is most difficult to produce](#).

We encourage the California Energy Commission to take bold steps to increase the efficiency of our building stock, and to set firm and fixed targets for performance that are already attainable today. **We encourage the CEC to consider adding a cap on space heating energy** to the Title 24, Part 6 energy code compliance requirements for all buildings because

- Space [heating is responsible for the highest carbon emissions from buildings](#)
- Peak heating demand does not coincide with peak renewable energy generation.

Jurisdictions across the country are looking at setting similar carbon emissions cap targets for their new and existing buildings. Indeed, our neighbors to the north in the City of Vancouver and the province of British Columbia have already set their top tier building energy step code [to align with targets set by the Passive House standard](#). The City of Vancouver has reported that the demand for higher performance products is driving significant growth in their local manufacturing industry and has already stimulated local innovation and market transformation. A [report released by the Vancouver Economic Commission](#) indicates that the clear targets and a high performance bar set by their step code are also good for business. Last month New York City adopted the [Climate Mobilization Act](#) that sets a carbon emissions cap for all large, existing buildings. We encourage the CEC to keep up with our neighbors to the north and east, and to set a similar high bar to enable California to rapidly reduce carbon emissions from buildings while simultaneously building our own high performance economy.

Passive House California
May 7th, 2019

Specific Responses to Stakeholder Input Request:

Building Standards

- o One goal from the 2016 Existing Buildings Energy Efficiency Plan Update was to make the 2019 Building Energy Efficiency Standards easier to use/understand than previous iterations. In your view, was this goal achieved? [No](#)
- o What are the immediate steps you recommend taking to improve compliance with building energy standards? [PHCA has previously recommended that all projects be requirement to perform a blower door test prior to verify compliance with basic code assumptions prior to final permit sign-off. We continue to strongly encourage the inclusion of this essential verification measure in order to set a benchmark for this metric, increase building energy efficiency, durability and reduce occupant health impacts driven by poor outdoor air, particularly in disadvantaged communities.](#)

Benchmarking

- o Are building owners looking at their energy consumption or just reporting to benchmarking? [No official comment](#)
- o What type of encouragement or support, beyond monetary, would lead to improved benchmarking scores over time? [Connect our energy use to those of our sister-city communities to build connection, support and sharing of strategies that help drive improvements.](#)

Market Transformation

- o How can local governments continue to support and/or expand energy efficiency efforts? [PHCA's members have shown that clear targets and defined metrics for efficiency support great outcomes. We encourage the CEC to consider defining a clear high bar target for all buildings, then laying out a set of incremental steps to will allow industry to methodically move towards their defined end goal. Our three-year, iterative code cycle does not currently provide sufficient transparency or direction to our industry. Without clear direction, industry is unable to implement long-term business strategies that support improvements in economic and performance efficiencies. Too much time is currently wasted every three years navigating new codes, then learning how to implement and comply with each new code cycle's updates. Our industry's time and energy could be better utilized if a clear 'end goal' target was set with intermediate, stepped updates that move towards the defined target. This is a key feature of the Passive House](#)

standards: clear targets, based on good building science supported by tools and methodologies that enable teams to deliver these rigorous targets.

o Which private-sector financial mechanisms have been most successful in supporting energy efficiency? [No official comment](#)

o What changes, if any, are expected or ongoing in the energy efficiency market due to the expansion of community choice aggregators? [No official comment](#)

o Have you seen improvements in energy efficiency marketing, outreach, and education efforts? If not, what areas are still undeveloped? Please provide examples. [PHCA has proven that In spite of poor marketing, outreach, policy incentives or financial support, that a significant number of high performance projects can be delivered if professionals are given high quality, in-depth training. We have found that in order to produce good outcomes, industry professionals must undergo a **minimum of 5 days of in-depth training, supplemented with 2 to 3 days of online training.** This length of training is essential in order to assimilate the core fundamental building science principles necessary to attempt a high performance project. This is a serious investment of time. Project teams typically still require additional support and experience beyond their initial training. We have found that a well-educated community of building professionals is essential to good performance outcomes. We highly encourage further investment in core building science training that goes much deeper than what has typically been offered here in California.](#)

[Workforce training and development programs should offer subsidies to professionals that will allow them to consider longer, more intensive, deeper dive training courses such as those offered by the Passive House community.](#)

o In your opinion, what retrofit programs (please specify sector) are most successful? What makes the program successful? [Our PHCA experience has been that retrofits are more complicated than new construction and require more highly skilled professionals with access to cost-effective, high performance products. Our community has improved their ability to tackle retrofits after gaining confidence and skills from new construction. We believe that by setting high performance target requirements for new construction, we can seed the market for innovation to achieve faster and cheaper retrofits.](#)

o What barriers remain for energy efficiency to be a reliable grid resource? Are there data limitations, lack of quality results, lack of awareness, etc.? What immediate steps do you recommend the Energy Commission take to resolve these barriers? [Our largest barriers to achieving high performance targets such as those defined by the Passive House standard have been those set by local jurisdictions: zoning limits that limit density, enforce/require discontinuous thermal envelopes for reasons such as second story setbacks, and design guidelines and discretionary hearing mandates that force designs to implement 'broken massing' are the biggest barriers to achieving cost-effective, high performance design. City design guidelines and zoning regulations are most often in conflict with the physics and economics of efficiency that bend towards radical simplicity in all things, including material- and energy-efficiency.](#)

Building Decarbonization

- o What are the main concerns with implementing programs that focus on reducing carbon emissions from buildings? Programs should be simple, but not too simple. Programs that target only 'net zero' or only EUI are at risk of not reducing heating loads sufficiently. For California to achieve deep carbon emissions reduction from buildings, we need to focus on 1. space heating reduction and 2. hot water heating and use reduction and 3. Total building carbon emissions. Including all three metrics should be part of all decarbonization program metrics.
- o Heat pump water heaters and space conditioners are expected to play a role in building decarbonization, they currently occupy a small portion of the market; what actionable steps do you think are viable to improve the market potential of the technology? Education, education, and further education of professionals. Mandated education of installers. Our industry workforce needs to become much more comfortable with this new technology and to do so they require education. Feedback from all our clients tells us that the industry is reluctant to install equipment they have no experience using because they simply aren't educated or comfortable with the products. To overcome this 'fear of the unknown' education is key. Professionals are in the same boat. They need specific education on the details of high performance buildings because these need to be designed differently in order to optimize efficiency. The slow uptake of signatories to the Architecture 2030 commitment has demonstrated the design community's reluctance to make promises they are unsure they can deliver. We need to fund training programs that provide the tools and techniques needed by professionals to ensure successful outcomes.

Low Income and Disadvantaged Communities

- o What type of energy efficiency programs are shown to be most successful in low-income and disadvantaged communities? Please cite any evidence such as program results or customer testimonials. Pennsylvania Housing Finance Agency (PHFA) initiated a financing program that awarded additional points for low-income affordable housing projects seeking Passive House certification. Developers rose to the challenge and submitted proposals to meet this high performance criteria. The credit spurred design innovations that allowed these developers to deliver high performance buildings at cost parity to code compliant projects. This program has been replicated elsewhere to varying degrees of success. Information on this program may be found here:

<http://www.ecobuilding.org/code-innovations/policy-profiles/2015-passive-house-tax-credit-by-pennsylvania-housing-finance-agency>. Application form for project from PHFA may be found here: https://www.phfa.org/forms/multifamily_application_guidelines/submission/tab_08/tab_08_03.pdf

PHFA's program is notable because it exclusively identified and awarded projects achieving Passive House certification for these additional qualifying points. We have seen their program replicated in other states, but as successfully because the same points were awarded to all other green certification points, thereby diluting the uptake of the increased performance and lower operational costs that are synonymous with certified Passive House buildings.

Standards Compliance

o In your experience, what are the primary drivers of non-compliance with building standards? Many code increases are perceived as not being directly linked to realized efficiency improvements. Clear messaging and data regarding efficiency improvements to code should be made available to the industry professionals that help provide a deeper understanding of expected outcomes and why codes were updated. A clear target or destination that also lays out how far each improvement has to go before it reaches the point of optimized efficiency would help provide clarity and meaning to the industry. PHCA members have found that once the 'why' is explained, the industry is able to come up with multiple innovations to efficiently solve the 'how.'

Workforce Development

o Have state efforts resulted in workforce improvements to install energy efficiency measures? No. (See our comment on Standards Compliance.)

o Provide examples of effective energy efficiency workforce training efforts.

In 2011 NYSERDA provided \$220K funding for subsidized workforce training and development programs that accelerated adoption of high performance buildings. This funding was used in New York as underwrite small subsidy grants for professionals taking Passive House Consultant, Designer and Tradesperson trainings. This funding seeded a community to attain critical mass and has enabled an escalation of projects being designed and built to Passive House standards to the extent that now RFP's issued by the NYC Housing Authority are able to require Passive House performance targets as a baseline delivery requirement.

<https://www1.nyc.gov/site/hpd/developers/request-for-proposals/SustainNYC-RFP.page>

PHCA has replicated this grant awards program and has received a small award from SoCal Edison (SCE) that will be awarded specifically to professionals working on multifamily buildings. We will be monitoring the outcomes of this program to track the impact of this program relative to the number of projects produced by the recipients of this grant program.