

**DOCKETED**

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November 27, 2019

Commissioner Andrew McAllister

California Energy Commission

1516 9th St

Sacramento, CA 95814

**Re: Comments on 2022 Update to Title 24, Part 6, the Building Energy Efficiency Standards**

Dear Commissioner McAllister,

I write to express strong support for the CEC's 2022 building code prioritizing decarbonization as its primary goal, and the immediate retirement of Time Dependent Valuation (TDV) as a metric. As a mechanical design engineer, sustainable design consultant, energy modeler, climate action planner, and program implementer; I have helped to design over sixty sustainable buildings across five continents. I have been practicing in the state of California since 2006; and worked on climate and zero net energy building policy for cities and utilities throughout the state.

I appreciate everything the CEC, your office, and the California Energy Code has done for energy efficiency, especially with regards to lighting, envelope, and HVAC efficiency. However, nuances in the Code have been adversarial to California's climate goals, especially with regards to decarbonizing buildings – which is only possible at-scale through rapid, widespread, building electrification and 100% carbon free electricity supply. TDV is the root cause of these issues, and when witnessing the results of TDV-rooted energy modeling over the past decade, I have often wondered if the metric was designed by the fossil fuel industry. Please retire the TDV metric as soon as possible, and consider the other approaches listed in this letter.

**1. The CEC should retire Time Dependent Valuation (TDV) as a metric**

While TDV has been extremely successful over the past nearly two decades at moving peak load away from mid-day, TDV has been woefully unsuccessful at decarbonizing our built environment. Since 2008, the International Living Futures Institute has disallowed on-site combustion of fossil fuels for Living Building Challenge Certification applicants<sup>1</sup>. However, as late as 2019, the TDV metric continues to produce energy simulation outputs which falsely insinuate claim natural gas appliances are more efficient than electric appliances, and hence better for the environment. TDV has been instrumental in convincing builders to select natural gas as an “efficiency” measure. In addition, TDV has misinformed the industry with regards to the environmental costs of incorrect fuel selection. TDV was a metric for a transition period, the same transition that focused on natural gas as a fuel, and, as of September 2018, that transition period is over.

**2. The CEC should work with key stakeholders to design and implement a new metric for 2022 that better aligns with California 2045 goals, and the building-related barriers and opportunities to meeting those goals, while ensuring new construction does not over-burden the grid.**

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<sup>1</sup> <https://living-future.org/contact-us/fag/>.

As critical as energy efficiency and emissions reductions are to California's energy future, a zero-carbon future is fundamentally different than previous CEC approaches. The central points to meeting these goals are:

- Maintaining energy efficiency
  - Decarbonizing all building end uses
  - Creating an opportunity for zero emissions at all hours, by leveraging storage and dispatchability at hours when there is no renewable resource.
3. **The CEC should create a single electric baseline for all energy sources and use energy valuation metrics that appropriately reflect the lower greenhouse gas emissions of all-electric buildings, rather than bifurcating standards for natural gas and electric construction.**

California's buildings are responsible for 25 percent of the state's climate emissions,<sup>2</sup> and more than half of those emissions come from burning gas or propane in furnaces, water heaters and other gas appliances.<sup>3</sup> Separating performance standards for natural gas and electric heating would allow the market to continue to construct gas-fueled buildings for at least another 3 years. If we allow gas-heated building construction in the 2022 building code cycle, these buildings will stand for decades and have lasting greenhouse gas emission impacts.

Furthermore, the Future of Gas Distribution Study emphasizes that gas-heated buildings are more expensive to build, leave Californians vulnerable to higher energy bills and will cost the state even more to retrofit in the long-term.<sup>4</sup> Continued investment in maintaining the gas pipeline system will result in avoidable cost impacts to Californians while undermining achievement of the state's climate goals. The state must set a clean energy standard in new construction now, as more than fifteen California cities have already done, to avoid paying major financial and climate costs down the road.

4. **The CEC should update any underlying metrics to appropriately reward load shifting, demand response, pre-cooling, energy storage, and other load flexibility technologies.**

Currently, the retail adjustment adder remains a constant value during every hour of the year. However, this "flat adder" does not properly reward the benefits of load flexibility technologies. Rather than reflecting near-zero or negative TDV prices at midday on some days, the TDV at best reaches half the peak price or slightly lower than the average price. This isn't reflective of utility cost recovery through rates, which is mostly volumetric, with only a small share of cost recovery through fixed charges. Load flexibility technologies, such as demand response, pre-cooling, and energy storage, are critical to a decarbonized future and should be properly rewarded for their benefits to the grid.

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<sup>2</sup> Brook, M. California Energy Commission. "Building Decarbonization." June 14, 2018 IEPR Workshop on Achieving Zero Emission Buildings.

<sup>3</sup> <https://www.nrdc.org/experts/joe-vukovich/real-climate-impact-californias-buildings>

<sup>4</sup> E3 Future of Natural Gas

**5. The CEC should update the Energy Code’s underlying assumptions to reflect: the state’s mandate of carbon neutrality by 2045 (EO B-55-18), a faster rate of building electrification, and a more realistic supply of bio- and synthetic gas.**

The TDV proposed for the 2022 building code rests on several assumptions that do not factor in the climate imperative and financial advantages of zero emission buildings. These TDV assumptions include (1) an 80 percent emission reduction by 2050 (2) a slower rate of building electrification, and (3) a 10 percent biogas pipeline blend by 2030. Assuming an 80 percent reduction by 2050 (EO B-30-15/EO S-3-05), instead of Governor Brown’s more recent mandate of carbon neutrality by 2045, disregards widely accepted climate science and recommendations by the Intergovernmental Panel on Climate Change. Although a plan for achieving carbon neutrality is still in flux, California must set itself up for success by encouraging a faster rate of decarbonization.

Moreover, the Future of Natural Gas study found that achieving 80 percent greenhouse gas reductions through electrification of buildings with zero-carbon energy would save consumers between \$5 and \$20 billion versus decarbonizing the natural gas system to achieve the same reductions.<sup>5</sup> In order to unlock these cost savings, the 2022 building code should both encourage a faster rate of building electrification, while simultaneously assuming a realistic supply of bio- and synthetic gas. As of now, the building code assumes that by 2030, California will fuel 10 percent of natural gas demand through biogas, when this energy source currently only meets less than 1 percent of state demand. This estimate fails to acknowledge the extremely high price of bio- and synthetic gas<sup>6</sup> and that the state has no policy in place to achieve 10 percent biogas supply by 2030. Therefore, the Energy Code should be updated to properly reflect a more realistic, lower supply of bio- and synthetic gas.

**6. While I strongly support the CEC’s inclusion of non-combustion emissions, including refrigerants and methane leakage, the assumed methane leakage rates should be more closely aligned with widely accepted estimates.**

I strongly agree that California must account for non-combustion emissions to track these emissions and create mechanisms to incentivize non-combustion emission reduction. This is especially important for methane leakage, as the use of natural gas in buildings carries with it much more than the combustion burden. However, the proposed 0.7 percent rate for methane leakage assumes there is only a rate of 0.2 percent leakage upstream. This value is less than 10 percent of the widely accepted rate of 2.3 percent.<sup>7</sup> I recommend estimating methane leakage at 2.8 percent to account for 2.3 percent upstream leakage and 0.5 percent leakage behind-the-meter.

Thank you for your consideration,

**Blake Herrschaft, PE, LEED AP**

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<sup>5</sup> E3 Future of Natural Gas

<sup>6</sup> E3 Future of Natural Gas

<sup>7</sup> Alvarez, Ramón A., et al. “Assessment of Methane Emissions from the U.S. Oil and Gas Supply Chain.” *Science*, American Association for the Advancement of Science, 13 July 2018, [science.sciencemag.org/content/361/6398/186.full](https://www.sciencemag.org/content/361/6398/186.full).