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350 Bay Area Comments on the 2019 Building Energy Efficiency Standards and Workshop on Zero Net Energy (Docket #17-BSTD-01)

Please see attached file.

Additional submitted attachment is included below.

May 5, 2017

Subject: 350 Bay Area Comments on the 2019 Building Energy Efficiency Standards and Workshop on Zero Net Energy **(**Docket #17-BSTD-01)

350 Bay Area, with a reach of more than 20,000 people, is working for deep reductions in carbon pollution in the San Francisco Bay Area and beyond.

SUMMARY

We recommend adding an "emissions budget," to the energy cost budget used for determining Title 24 code compliance, and adding an all-electric baseline building (with heat pumps providing space and water heating) to fairly reflect the benefits of electrifying building end uses. Doing so is consistent with the state's ambitious climate targets, and the necessity of making deep reductions in greenhouse gas emissions.

RATIONALE

The time dependent valuation (TDV) structure serves two purposes:

1. evaluating new elements of Title 24 energy code for cost-effectiveness, and
2. assessing compliance of building designs with Title 24 energy code under the "performance-based" approach.

The current TDV structure is geared towards a "modified participant cost test," to determine whether a building design is roughly cost-effective for the owner over its lifetime, in comparison with a baseline energy code-compliant building. While this energy cost-based approach proportionately reflects the benefits of replacing one electricity or natural gas end use with a more efficient end use of the same fuel, it does not adequately reflect the greenhouse gas emissions reduction benefits of shifting from natural gas to electricity. Based on the lower cost of natural gas, the TDV approach disproportionately "favors" natural gas as an end-use fuel.

The TDV structure should adequately reflect the climate benefits of electrification in building systems, including electric heat pumps for space and domestic hot water heating.

Greenhouse gas emissions and the air pollutants associated with fossil fuel combustion are a driving force behind the Title 24 standards. Electrification is widely accepted as one of the three steps to achieving deep reductions in greenhouse gas emissions (in addition to energy efficiency and renewable energy). We recommend that a new TDV approach take into account the greenhouse gas emissions associated with each fuel type (electricity, natural gas, propane, etc.) in order to accurately reflect trade-offs between different fuels.

One way of accomplishing this would be to implement an "emissions budget" as an alternative to an "energy (cost) budget," for assessing compliance with Title 24 under the performance path. An emissions budget could be used in addition to the energy cost budget to assess new energy-efficiency

measures for inclusion in the code. A proposed design could comply with Title 24 by meeting the energy (cost) budget or a weighted average of the energy cost budget and the emissions budget.

The Warren-Alquist Act ("Act") requires that new code measures be demonstrated to be cost-effective (In section 25402, Subsection 3, the Act states, "The standards adopted or revised pursuant to subdivisions (a) and (b) shall be cost-effective when taken in their entirety and when amortized over the economic life of the structure compared with historic practice.") However, the Act sets no requirements for tests used to assess compliance with code under the performance path.

METHODOLOGY

The following are specific comments addressing how to account for greenhouse gas emissions in the TDV structure:

- Carbon estimate: The TDV structure already calculates carbon emissions associated with electricity or natural gas use in order to calculate a "cost of carbon." An emissions budget could use these estimated emissions directly.
- Methane estimate: The greenhouse gas emissions profile should account for "fugitive" methane emissions associated with natural gas extraction and distribution. Methane has thirty four times the global warming potential (GWP) of carbon dioxide over a one-hundred-year period, and, importantly, a GWP of 86 over a twenty-year period, as documented in the Intergovernmental Panel on Climate Change's Fifth Assessment Report. Conservative estimates of methane emissions are available from recent studies.
- Prospective carbon estimate: The greenhouse gas emissions profile should account for expected reduction in carbon intensity of electricity over time. California's renewable portfolio standard (RPS), which calls for at least 50% of electricity to be generated from renewables by 2030, will be a strong contributor to reduced carbon emissions associated with the electricity sector.
- Establish an "electric baseline" building with electric heat pumps providing space and water heating. In analysis presented at the July 2016 workshop, Enercomp and E3 demonstrated that a representative all-electric baseline building (with space and water heating provided by heat pumps) had lower life-cycle carbon emissions than mixed-fuel buildings, in all California climate zones.[1] However, the all-electric buildings generally had higher TDV energy consumption than the mixed fuel buildings. Establishing an all-electric baseline building could serve as a stop-gap measure for fairly evaluating all-electric buildings, until more fundamental changes can be made to the TDV approach.

[1] [1] Results of analysis were presented by E3 at the CEC Staff Workshop on 7/15/16.