

February XX, 2016

Commissioner Andrew McAllister  
California Energy Commission  
1516 Ninth Street  
Sacramento, CA 95814

Dear Commissioner McAllister:

**Re: Addressing the disparity in electric and natural gas Time Dependent Valuation (TDV) metric used in Developing Title 24 Building Energy Standards**

We, a group of municipalities, utilities, environmental advocates, and [add group types], are interested in achieving increased energy efficiency and reduced greenhouse gas (GHG) emissions through California's Title 24 Building Energy Standards. We commend the California Energy Commission for its leadership in developing strong energy efficiency building standards. As the CEC begins work on the 2019 Title 24 Standards, we respectfully request that the CEC leverage Title 24 to support not only energy efficiency goals but also GHG emissions reductions in both new and existing buildings. This is especially important in light of the declining carbon intensity in the state's electric supplies.

Outlined below are the disparities we see in natural gas and electric TDV used in developing Title 24 Building Energy Standards and our suggested recommendations on ways to reduce the hurdles to the adoption of highly efficient electric heat pump technologies.

Title 24 has historically been focused on overall reductions in energy use, rather than emissions. Since emissions vary depending on the energy source, reductions in energy use do not correspond uniformly to reductions in emissions. Given California's goal of reducing GHG emissions by 80 percent of 1990 levels by 2050, the CEC could help achieve this aggressive goal by leveraging Title 24 to encourage building designs that are both energy-efficient and minimize GHG emissions. In 2013, the California building sector accounted for 27%<sup>1</sup> of energy-related GHG emissions. As California moves toward a 50% renewable portfolio standard (RPS) and a more decarbonized electric supply, building designs that utilize energy-efficient electric heat pumps for space and water heating will have the potential to dramatically reduce or eliminate a building's carbon footprint. Yet, the deployment of these efficient electric heat pump technologies is currently discouraged or even prohibited by today's building code. As stakeholders committed to a sustainable environment, we urge the CEC to make the necessary changes to the upcoming 2019 Title 24 Building Energy Standards to achieve the dual goal of reducing GHG emissions and increasing energy efficiency.

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<sup>1</sup> In 2013, residential and commercial end uses each accounted for 13.3 percent of statewide GHG emissions. This includes both fossil fuel consumption on-site (for example, gas or propane for heating), as well as upstream emissions from electricity that served those sectors. (source: CEC 2015 Integrated Energy Policy Report)

**Overview of the TDV methodology** – The Title 24 Building Energy Standards are developed based on the cost-effectiveness of building energy efficiency measures, using the Time Dependent Valuation (TDV) metric. TDV values represent the cost of energy and are calculated based on the projected hourly electricity cost (and monthly cost for natural gas and propane). TDV values are specific to each climate zone using the Investor-Owned Utilities' (IOUs') costs for each fuel type. The TDV values for electricity include an RPS adder that represents the incremental cost of procuring renewable resources for RPS compliance. For non-renewable energy (e.g. non-renewable electricity, natural gas and propane), a carbon adder is included in the TDV values to account for the cost of GHG emissions. The TDV values are adjusted to retail rate levels such that the energy costs for different building designs are taken from a building owner's perspective. To meet the Title 24 standards, a proposed building design must not exceed a given TDV budget for energy use related to space heating, space cooling, indoor air quality ventilation, and water heating. Electric efficiency savings that occur during peak times, such as the hottest summer hours, are therefore preferred over energy savings that occur during off-peak hours such as the middle of the night when electricity cost is much lower.

**Limitations of the TDV methodology** – The current TDV values are vastly different for gas and electricity. For example, in Climate Zone 12, where Sacramento is located, during peak hours the TDV values for electricity are a hundred times greater than the TDV values for gas for an equivalent unit of onsite energy usage. Because lower TDV values are favorable, this inequity embedded in the current TDV methodology causes a structural *bias* against electric heat pump technologies for water and space heating. Up until now, this bias favoring natural gas systems could be justified from both an emissions and consumer cost perspective. However, the decreasing carbon intensity of electricity and the development of high efficiency electric heat pump technologies have upended the assumptions within these models. For example, using the current TDV values in Climate Zone 12, a highly efficient 50 gallon heat pump water heater with Energy Factor (EF) of 2.6 has a higher TDV value than a natural gas water heater that barely meets the minimum federal efficiency standard (EF of 0.575).<sup>2</sup>

For the 2016 Title 24 standards, natural gas is used as the reference fuel for water heating in new homes and for space and water heating in existing homes that use natural gas. This effectively prevents an all-electric home from passing the Title 24 standards, despite the fact that these homes have zero or very low GHG emissions (depending on the carbon intensity of the electric supply). This is also troubling because it is much more cost-effective to incentivize energy efficiency and GHG reductions in the initial design phase, rather than trying to capture these savings in retrofits later on.

This bias against electric systems is exacerbated for jurisdictions that are outside of the IOUs service territory, as the TDV methodology does not reflect the renewable content or retail rates of electricity in these jurisdictions. For example, Palo Alto's electric portfolio has been carbon neutral since 2013. Many cities that are served by other municipally owned utilities or Community Choice Energy providers will also have significantly different renewable content in

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<sup>2</sup> Source: NRDC Comments on the 2016 Title 24 Building Energy Standards – 45-Day Language, submitted on March 30, 2015

their energy supply from the IOU's portfolio used to set the TDV. In many of these jurisdictions, all-electric building designs provide substantial emissions benefits, and yet these designs are still severely restricted or prohibited by current code.

**Recommendations** – We request that the CEC consider how to encourage highly efficient and low GHG emission building designs as it works to develop the 2019 Title 24 Standards. Potential solutions include:

1. Allowing an appropriately-sized TDV credit (or embedding a scaling factor) for proposed designs that use efficient electric heat pump based water heating or space heating. This approach would counterbalance the current bias against electric systems. The value of the TDV credit or scaling factor could vary by climate zone; or
2. Allowing an alternate compliance baseline based on building emissions in addition to the current TDV budget based compliance baseline. Under this approach, the software would calculate both a TDV and emissions budget for the reference design. A proposed design could comply by meeting either the TDV budget or a weighted average of emissions budget and TDV budget; or
3. Modifying the reference building to use the same fuel type as the proposed design, irrespective of whether that is gas, propane, or electricity.<sup>3</sup>

We welcome the opportunity to follow up with you and your staff to explore solutions to overcome this disparity. We appreciate your attention in this matter.

Sincerely,

[Add signatories]

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<sup>3</sup> Appendix 1 of "NRDC Comments on the 2016 Title 24 Building Energy Standards – 45-Day Language" offers proposed language to correct bias against electric heat pump water heaters.