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**Comments on June 14 Commissioner Workshop on Achieving Zero
Emission Buildings**

Additional submitted attachment is included below.

To: California Energy Commission

Re: Comments on June 14 Commissioner Workshop on Achieving Zero Emission Buildings

From: Claire Broome, MD Adjunct Professor, Emory University School of Public Health, 350 Bay Area

June 28, 2018

The excellent Commissioner workshop on June 14 resulted in several clear conclusions:

- 1) **Time is of the essence** for California to achieve zero emission buildings due to the slow turnover time of building stock, the infrequent replacement of appliances such as space and water heaters, and the urgency of the climate crisis.
- 2) Given recent new data that methane leakage in the gas distribution system is well above EPA estimates and the known climate impact of methane, CEC should **concentrate on the electrification scenario** and do everything possible to **accelerate the transition away from building uses of natural gas**. Continued investment in natural gas infrastructure to connect new construction in 2018 is a waste of resources better used to incent beneficial electrification, likely to lead to stranded assets, and is incompatible with California's health and climate goals.

The workshop was particularly constructive in presenting practical opportunities for accelerating beneficial electrification of new construction, for example by use of high efficiency electric heat pumps for space and water heating. As Sean Armstrong from Redwood Energy noted, there are **9 Japanese HVAC and dhw heat pumps that are 40 to 60% more efficient than those sold in America by the same brands, and that use no greenhouse gas producing refrigerants**.

The commission could encourage programs providing **incentives** for high efficiency electric heat pumps for a range of technologies, brands, efficiencies and costs, **which exclude the worst performing units, and move toward a higher fleet average efficiency**. For example, a program could require a minimum COP or energy factor based on a technology and market review to establish program metrics. Higher incentives could be tied to higher efficiency. It would also be attractive to incorporate **incentives for grid connected products and participation in benefits for the grid such as load shifting programs**.

Several speakers also addressed the challenging problem of **retrofitting existing buildings** that currently use natural gas space and water heating. Two particularly constructive solutions warrant emphasis:

- 1) Several speakers advocated a **"mid-stream" incentive program** (incentives targeted to installers), rather than incentives to homeowners, as a better approach to **retrofits for electric heat pump water heaters and space heaters** because these appliances tend to get replaced in an emergency, and therefore require a motivated and knowledgeable plumber/installer who has inventory on hand.
- 2) Sean Armstrong from Redwood Energy made the point that it would be cheaper and less difficult for homeowners to **use the more efficient heat pumps used in Japan since at least 2014, rather than retrofit existing homes with new panels and wiring** to accommodate the heat pumps currently available in the US. A well-designed incentive program that offers incentives/rebates to local companies/ installers could help generate the necessary market for such higher efficiency appliances and bring the cost barrier down to the consumer.

Finally, the **Commissioners of key California regulatory bodies such as the CEC and the CPUC should immediately commit to removing barriers to fuel substitution** in new construction and in upgrades for building retrofits, including any barriers to fuel substitution in the title 24 standards, and revision of the

three prong test at the CPUC. Rather than proceeding with a business as usual time frame, these barriers should be removed on an emergency basis.

As noted in the macroeconomics presentation from UC Berkeley, the economic costs of the health impacts of fine particulate pollution from emissions are real and substantial, with the burden falling especially on disadvantaged communities. As a public health professional, I am surprised that a California agency in 2018 would discuss cost effectiveness of fuel substitution without acknowledging these all too real costs which are borne by the residents of California. It is well past time to remove any barriers to fuel substitution based on inadequate tests of cost-effectiveness which are biased in favor of gas and against the public's health.