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Support All-Electric 2022 Building Code

Additional submitted attachment is included below.

This Docket log is in support of Docket 235287 for Docket 19-BSTD-03

Dear Commissioners

Thank you for the opportunity to comment on Docket 19-BSTD-03. This memo is in support of **moving the all-electric baseline to 2022**.We need this in support of B-55-18 (1) (Carbon Neutral California in 2045). Any new project has challenges. Any new program needs to address costs, safety, and reliability I know the CPUC and CEC are actively working on the challenges. We need to face these challenges and use gas only for those items where it is absolutely needed.

Move to All Electric, Stop the risk of stranded assets.

All electric appliances are what is needed to meet the carbon neutral goal of 2045. Investment in more gas appliances that are not needed long term will become stranded assets. The lifespan of buildings is 50 to 60 years. So, it is wise to equip them for the time they will be in use.

- Going all electric as early as possible addresses the concern about stranded assets.
- We need to go all electric (or as close as possible) to minimize gas consumption and move to carbon neutrality.

Consequences of delaying the move from gas to all-electric

- The mechanical room for the all-electric heat pumps is larger and has electrical resources that are not in the all-gas one. In addition, the service entrances into the space must be large enough to move in the new equipment
- The risk is if one does not do this and then must do it later (expensive)
- If one starts with mixed fuel and switches to all-electric, this must be done early in the Design Development phase. process. If it is delayed, one risks having design problems which can cause delays and expensive change orders.

To avoid stranded assets, plan early to go to all-electric. We risk installing buildings in the next 3 years of buildings that last 50 years. These mixed fuel buildings risk being stranded assets if we do not go all electric.

Cost Competitiveness

We have achieved short term cost competitiveness with electric appliances replacing gas appliances in many cases. Having only one energy network (electricity) is a lower first cost than the mixed fuel model with both gas and electricity.

Longer term cost competitiveness (operational) is likely assured due to the nature of the gas market. As California moves to carbon neutrality, the quantity of gas consumed will go down. The major cost of natural gas is the transportation through the pipelines. When the quantity of gas drops, the pipeline cost is amortized over a smaller revenue base. That means the cost per unit of energy transported goes up. When gas prices rise, the move to electricity become more cost effective.

Dangers of gas stoves, cooking, and asthma (2)

Gas stoves burn natural or fossil gas. The burning process emits carbon monoxide, formaldehyde, ozone, and nitrogen dioxide. While all four are toxic, asthma is most effected by nitrogen dioxide. The level of Nitrogen Dioxide emitted by a stove can be 4x over the safe exposure limit for outside air.

There are two main issues with kitchen ventilation systems (3) .

- They are often not used because they are noisy
- They are often not effective either from design and / or from filters that are plugged or defective.

Upgrading ventilator fans should:

- Raise the airflow from100 CFM to 700 CFM
- Lower noise to 3 Sones.
- Create a mounting plan that reduces the noise, so people use the fan.
- Until we have this, upgrading ventilation alone will not address the whole problem.

Limiting Nitrogen Dioxide with electric cooktops

One can significantly reduce the amount of nitrogen dioxide by going to an electric stove. These types are all available today:

- Electric resistance coil burners have been available for many years.
- Radiant heaters are easier to clean and have better control
- Induction cooktops are the latest technology. They are often rated higher for their cooking experience compared to gas cooktops. They have finer control and heat up and cool down more quickly than gas.

Safety and Induction Cooktops (4)

Induction cooktops are viewed as the best way to cook by many people. Some of the best restaurants like the French Laundry in California believe it is the best cooking method. It also has the following safety features:

- There are no open flames.
- Only the pots themselves get hot
- If there is no pot on the burner, there is no heat transfer
- The heat can be shut off more quickly than gas.

Safety from eliminating gas from the household

- If one eliminates gas from the household, there is no gas to explode.
- One month ago, there was a fire and explosion for a house in Los Altos where the building had to be evacuated.
- The Los Altos (5) explosion was almost exactly 10 years after the fire end explosion in San Bruno (6).
- A pet can walk across the top of a gas stove and turn on the gas. That happened to one person, who was lucky enough to smell the gas and vent the room before something happened.

All-electric configurations and reliability

There are many definitions of reliability including:

- Total up time (or down time)
- Time to recover from an outage
- Number of people affected by an outage

Gas appliances use electrical starters as a safety feature (no pilot light burning). This says that most gas appliances will remain off-line until the electrical power is restored. Stoves are one of the few items that can remain on-line since they can be started with a match. The challenge is that no electricity usually means no exhaust fan to clear exhaust. The reliability discussion should be continued.

Moving to all-electric in the 2022 building code.

There are challenges to move forward on an accelerated schedule. We need to ensure the cost, reliability and safety parameters are met. However, there are good reasons to try to move forward on accelerating to all-electric in 2022 including:

- Limiting creating new stranded assets with all electric buildings starting in 2022.
- The improved safety of not having gas in the building
- The lowered first cost of having only one energy infrastructure (electricity) instead of two (electricity and gas)
- The increased safety of electric cooktops, especially induction cooktops
- The lower levels of asthma inducing Nitrogen Dioxide with electric stoves.

Thanks again for the opportunity to present on this issue. Please consider Moving ahead rapidly for full electrification.

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