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Guttmann & Blaevoet
CONSULTING ENGINEERS

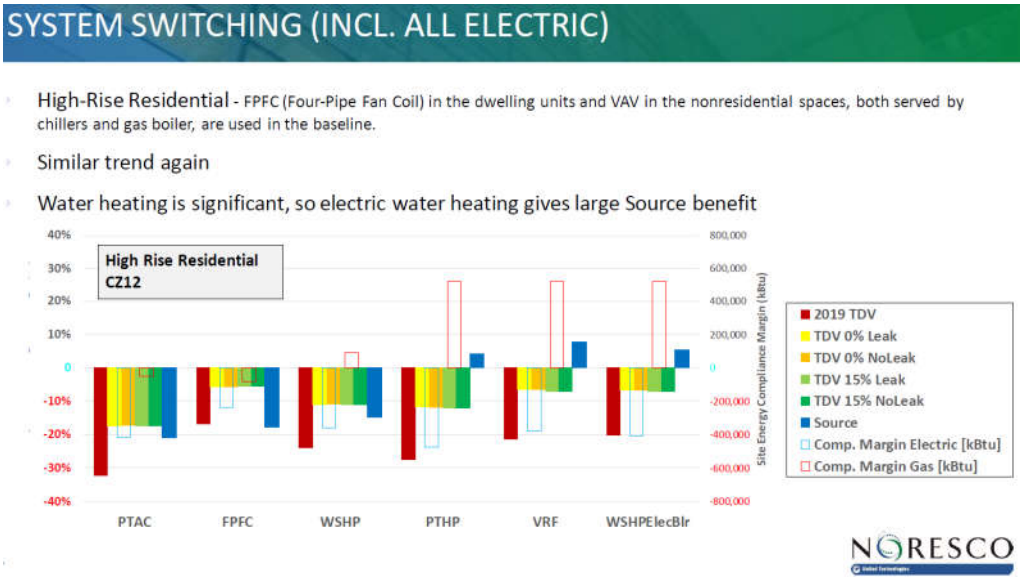
To: California Energy Commission Staff
April 10, 2020

Guttmann & Blaevoet Consulting Engineers Comments for 2022 Energy Metrics

Dear Commissioners and Staff-

Please allow me to thank and congratulate you all on all the very hard work you have put in on updating the TDV Metrics and adopting the new Time Dependent Source energy metrics. These will both be incredibly important for meeting our State's energy goals. Please accept these few additional items for your consideration:

1. Adoption of the two Energy Design Rating (EDR) approach for non-residential buildings will be a significant challenge. The reason that works well for Low Rise Residential and Multi-family buildings right now is because you have enabled a fuel neutral baseline in that section of the Alternative Calculation Method (ACM) Manual that allows an all-electric building to be compared to an all-electric baseline. The non-residential baseline currently proposed remains an apples to oranges comparison, electric to gas in the baseline for all HVAC system types and occupancies. For certain occupancies with high hot water usage the baseline is also a gas fired system. Roger Hedrick's presentation identified certain occupancies that will be challenged by the two EDR baseline approach for high rise residential, hotel/motel, medium retail, and large office buildings with central plants. In this example below for the high rise building every building takes a TDV penalty and only three show TDS savings, using the two EDR approach NONE of these examples would show compliance without significant energy efficiency measures having to show compliance with both metrics. With all of the improvements to the TDV metric in the last few months this discrepancy between the baseline can only be resolved using a fuel neutral baseline. We encourage the commission to consider adopting a fuel neutral baseline in the 2022 standards for Non-residential buildings as has already been done for low rise residential and multi-family occupancies. A transition to a single all electric baseline is encouraged as well.



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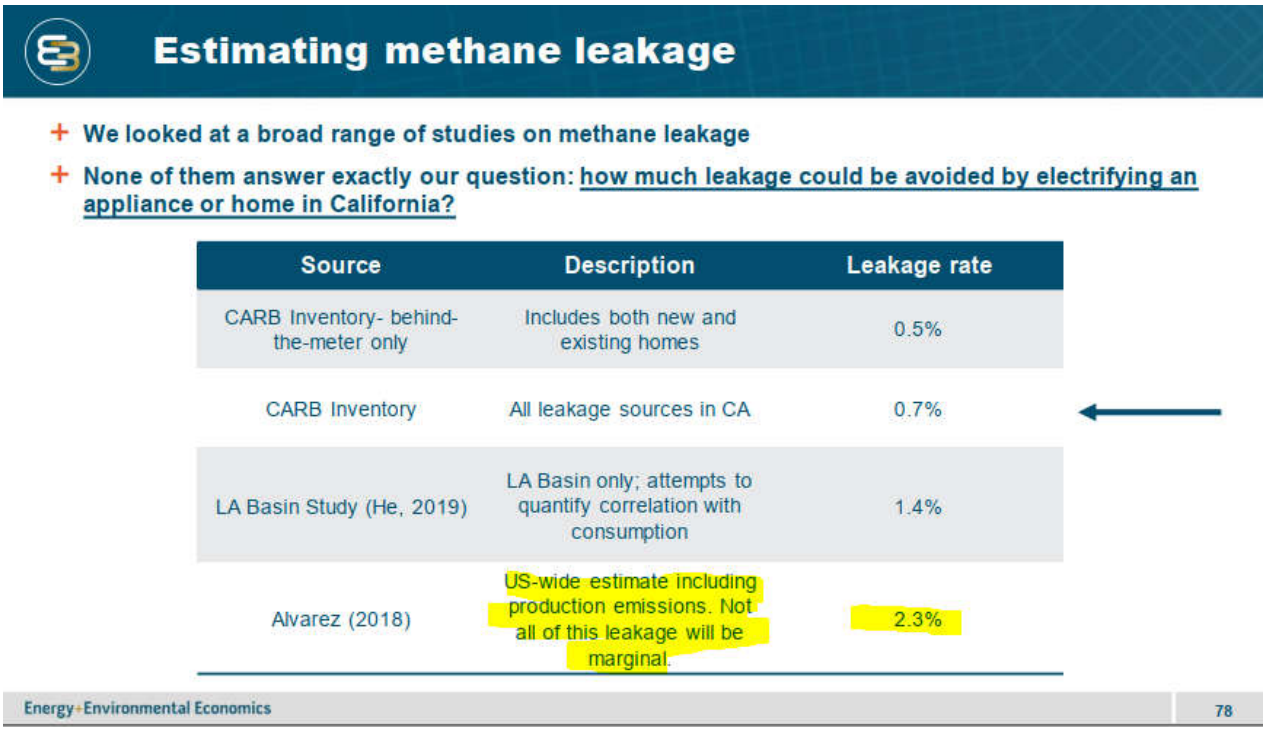
2. Methane leakage in the TDV equations should be updated to reflect out of state GHG impacts from the source. Since 90% of our natural gas is imported from other states, we must include that impact to global health in our equations for building standards. If we do not, we under count the global warming potential in our building design decisions. We suggest at a minimum including the larger estimate of methane leakage based on the Alvarez 2018 report noted in the E3 presentation. This would still be incredibly conservative considering the amount of additional flaring of natural gas overall that is continuing to increase out of state where we import most of our natural gas from. The refrigeration leakage for heat pump equipment used the worst-case leakage rate so please use the worst case also for the methane leakage impact.



Estimating methane leakage

+ We looked at a broad range of studies on methane leakage
+ None of them answer exactly our question: how much leakage could be avoided by electrifying an appliance or home in California?

Source	Description	Leakage rate
CARB Inventory- behind-the-meter only	Includes both new and existing homes	0.5%
CARB Inventory	All leakage sources in CA	0.7%
LA Basin Study (He, 2019)	LA Basin only; attempts to quantify correlation with consumption	1.4%
Alvarez (2018)	US-wide estimate including production emissions. Not all of this leakage will be marginal.	2.3%

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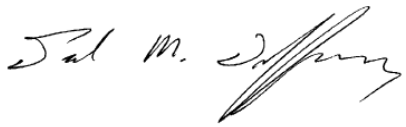
3. We need to enable Photovoltaic and battery storage in the non-residential software. With the interim prescriptive pathway for central heat pump water heating allowing the tradeoff for PV systems for the solar thermal efficiency requirement for the gas baseline the PV generation should be treated as the equivalent “efficiency” measure as the solar thermal system currently is. The ability to pair the solar generation from PV and run the heat pumps to store the energy in the thermal tanks should be a credit enabled by the software and roundly credited by the TDV and TDS metrics. Currently there is no way to take advantage of that TDV or TDS credit enabled in the software. Battery Storage systems should be enabled for this same reason.

Again, thank you for all your hard work on the metrics. Look forward to talking with you more about these issues and working with the Commissioners and Staff to get a really robust update to the 2022 Standards.

Sincerely,

Guttmann & Blaevoet
CONSULTING ENGINEERS



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