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Institute statewide Technology and Whole Building Tracking in BUILD and TECH Evaluation task

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Subject Recommendation: As a part of the â€œEvaluationâ€ component of SB 1477 implementation, set up a tracking system statewide to monitor the adoption of heat pump technology and whole building decarbonization starting with new construction. This system should address all such installations statewide, whether or not they are installed under BUILD, TECH or some other program.

Dear Mr. Scavo:

I appreciate to opportunity to comment on the Commissionâ€™s plans for BUILD based on the June 15, 2020 â€œvirtualâ€ workshop. I applaud the many efforts behind SB 1477, starting with those of Senator Henry Stern, and including the Commissionâ€™s efforts, those of the CPUC, the NRDC, the Building Decarbonization Coalition (BDC), and numerous others.

I am a signatory to the BUILD workshop comment letter being coordinated by Ms. Kayla Robinson and Mr. Cory Bullis through the BDC: to my mind it emphasizes (1) the urgent need for California to move as quickly as possible with decarbonization and 1477 implementation and (2) the practical need to keep BUILD as simple and streamlined as possible. These two points seek to increase BUILD participation and decrease costs. I completely agree with the letter.

My additional comments beyond that letter are focused on the â€œEvaluation of SB 1477â€ section of the workshop, first recognizing that the evaluation effort will
â€¢ Cover both BUILD and TECH in coordinated fashion (good idea!)
â€¢ Be funded, nominally, at $5 million (seems fine!)
â€¢ Follow â€œbest practicesâ€ of â€œMarket Transformation Initiativesâ€ (hard to

argue against!)

The evaluation effort does need to look closely at the mechanics and outcomes of BUILD and TECH, of course addressing statutory requirements and specifics about what worked well, what didnâ€™t, â€œlessons learned,â€ and so on. It should of course address the overall market impact of BUILD (and TECH). I would point out that the full task cannot be accomplished until after the program ends and would likely take an additional year. Given this time lag, and given that most outcomes will likely be plainly apparent in hindsight, the implementer should think carefully about the amount of resource focused in this area, especially for program operating mechanics.

What needs to be avoided is a myopic focus on every single building occupant in the participating projects, and the construction of elaborate tools seeking to determine GHG savings at the molecular level and bill savings down to every last penny. At a practical level, â€œtoo much detailâ€ costs a fortune, takes forever and benefits no one (except possibly the consulting team hired, which has inherent motivation to make the contract more expensive, not less expensive). After 38 years doing efficiency programs at PG&E, Iâ€™m here to tell you that, for any large program, someone, somewhere will have a bad experience (possibly a bill increase), and some piece of equipment, somewhere, wonâ€™t work exactly right (often due to an installation error). The standard for â€œsuccessâ€ should be that a substantial majority of occupants get good space- and water-heating systems that save them money, and that GHG emissions are substantially reduced compared todayâ€™s typical practice.

More importantly, myopic, narrow focus on â€œonlyâ€ BUILD and TECH cuts against the broad purpose behind SB 1477 in the first place, which, quoting from the bill, is to â€œadvance the stateâ€™s market for low-emission space and water heating equipment . . .â€ The whole idea, of course, is to create impact beyond BUILD and TECH.

I suggest that the evaluation effort include setting up and populating a statewide tracking system to monitor deployment of low emission technologies such as heat pump water heaters (HPWHs) and heat pumps, and fully decarbonized whole buildings. This system should capture this deployment whether or not it results by way or BUILD, TECH or some other program. For newly constructed buildings, such data should be available through building permit records, including the Title 24 runs. However, as we know, it is scattered across the permitting offices in the state, not collected in consistent fashion, and not reported centrally.

Heat Pump Water Heaters. Special emphasis is warranted on HPWHs: this technology, which most agree will be crucial to meeting the stateâ€™s 2045 climate goals, currently has a national market share in the range of 1% of all water heaters sold. For reference, about 8 million water heaters are sold in the US each year; only about 80 to 100 thousand are HPWHs. Most informed professionals think that this market share is even smaller in California, at most a few thousand, but no one knows! For manufacturers, a wholesale switch to HPWHs will be a major lift: target-setting and forecasting will

become critically important, but that exercise starts with data tracking.

Electric Resistance (ER) Water Heater Replacement. The tracking system should be designed to capture any ER water heater replacements with HPWHs. Given California prices for electricity, and based on CEC data, these replacements save far more energy dollars for customers and cost far less to install and than HPWH/gas replacements, making this market extremely important for quickly boosting HPWH market share in California (which would include associated employment and workforce training benefits). Additionally, at current and near-term GHG emissions rates from the California power grid, HPWH replacements of ER tanks save as much GHG as HPWH/gas replacements since HPWHs use about 1/3rd the energy of ER tanks. According to CEC data, there are well over 300 thousand ER tank water heaters in state; a 20 year equipment life implies a replacement market of 15 thousand per yearâ€"a program to promote such replacements at failure would quickly and meaningfully increase HPWH market share in California. But today we know little about this market overall, and little about prospects for HPWH replacement at failure.

Whole Buildings. Again, looking at residential new construction, it seems obvious that we would want to know how many â€œfull electricâ€□ residential buildings are permitted and subsequently built year over year in state. Recent data suggests that about 110 to 120 thousand new residential units are being permitted and built annually in the current time frameâ€"about half single family, half multi-family. How many will be full electric? One hundred? One thousand? Five thousand? Again, no one knows!

What we do know is that itâ€™s likely that solving the GHG contribution of the residential sector will require that all or nearly all of the 100+ thousand dwelling units built in the state each year be fully electric (or otherwise fully decarbonized). Many are calling for this transition to occur within a few years: today are we at 0.1%? 1%? 5%? We need to know. We will need a tracking system, goals, targets and metrics to address this effort.

Existing buildings. A more difficult problem will be decarbonizing the current existing housing stock: in the range of 2/3rds of that todayâ€™s stock will still be in service in 2045. A tracking system for existing homes presents additional complexity: there will be appliance-by-appliance conversions as well as full electrification retrofits. Data collection vehicles vary for such activity, and are unlikely to be consistent across permitting offices.

Begin with new construction. Due to the difficulty in tracking retrofits, I would suggest initial emphasis be placed on developing a tracking system for the new construction market, for which data sources should be available from building departments and utilities. A system for existing buildings could follow.

Since the overall purpose of SB 1477 is to accelerate this market as noted, it is entirely within scope to include a statewide tracking effort as part of the evaluation process. To be clear, I am not suggesting that the actual program operations and transactions not

be evaluatedâ€”this work has to be done. As a point of departure, I would suggest that 20% of the evaluation budget, or about $1 million, be designated to track and measure actual deployment of heat pump technologies and fully decarbonized buildings.

Diversity, equity, the tracking system, and in the evaluation effort overall. By design, BUILD is set up accelerate the market for low emissions technologies among the disadvantaged. I applaud this effort and support it without reservation. It will be crucial to understand the BUILD experience of participating developers, builders and, ultimately, the building occupants. More broadly, it will also become important to understand the extent to which these technologies are adopted broadly across this sector (beyond participants in BUILD or TECH). Accordingly, a component of the tracking system should include some method of tracking the appropriate demographic data to determine adoption rates among various demographic groups including the disadvantaged.

I greatly appreciate the opportunity to participate and comment on SB 1477.

Sincerely

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