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| <b>Project Title:</b>   | SB 100 Joint Agency Report: Charting a path to a 100% Clean Energy Future         |
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| <b>Organization:</b>    | Gregory Sutilff   |
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*Comment Received From: Gregory Sutilff*  
*Submitted On: 11/12/2019*  
*Docket Number: 19-SB-100*

## **Energy Efficiency, Thermal Storage and Demand Response**

Thank you to the Energy Commission Staff for working to ensure a safe and healthy future for all Californians. We offer these comments in support of this work.

SB 100 establishes a state policy that eligible renewable energy (RE) resources and zero-carbon resources supply 100% of all retail sales of electricity to California end-use customers and 100% of electricity procured to serve all state agencies by December 31, 2045

SB 100 also establishes interim goals of

- o 33% renewables on the grid by December 31, 2020,
- o 44% renewables on the grid by December 31, 2024,
- o 52% renewables on the grid by December 31, 2027, and
- o 60% renewables on the grid by December 31, 2030

Energy efficiency (EE) in existing buildings (EBs) is crucial to meeting both the interim and final goals of SB100 and a variety of other legislative mandates including but not limited to AB32, SB32, (etc. INSERT MORE HERE)

- o EE in existing buildings reduces the amount of renewable energy required, often at lower cost
- o But EE also has important benefits beyond mere energy savings and heating/cooling cost reductions to homeowners

Many older, poor-performing homes (of which there are millions in the State) are located in disadvantaged communities. Retrofitting those homes will achieve greater climate equity, environmental justice and economic resilience

EB Energy efficiency improvements/residential retrofits achieve important health benefits directly impacting vulnerable populations (children, sick, and elderly)

Energy savings reduce emissions from fossil fuels supplying the CA grid, which means lower fine particulate emissions and less ground-level ozone formation

Attic Floor Air Sealing eliminates/reduces pathways for potentially harmful particulates intrusion into the conditioned space of the home

The EPA estimates the health benefits at approximately 7 cents per kWh saved (see DOE's Public Health Benefits per kWh of Energy Efficiency and Renewable Energy in the United States: A Technical Report, July 2019)

Since RE is non-dispatchable, procurement of significant amounts of energy storage will be required as carbon-free firming power for wind and solar

- o To avoid construction and deployment of new natural gas peaking plants, Li-ion and other chemical batteries will have to provide much of the required energy storage; however, EE- and DR-enabled thermal energy storage can serve as an important supplement to batteries

- o EE/DR thermal storage is achieved when older, poor performing homes are retrofitted to make them more energy efficient via air sealing and additional insulation, along with smart thermostats. All such homes can then be networked and controlled en masse to pre-cool them using the abundant solar resource during the day so that less energy is needed in the evening, when the Duck Curve challenge must be overcome (see LBNL's Reducing Residential Peak Electricity Demand with Mechanical Pre-Cooling of Building Thermal Mass, Aug. 2014)

o This type of thermal energy storage has several advantages over chemical battery storage (both in the distribution grid and BTM)

i,§ Safety: EE thermal storage enhances health, safety, comfort and savings at no risk to occupants

i,§ Durability: lasts for the life of the home

i,§ Supply chain security: all materials are made in USA and all embodied labor is domestic

i,§ Benefits focused on disadvantaged communities in the state, not out of state utility shareholders

In implementing SB 100 and producing the report required by it, please include the critical importance of EE and EE-enabled thermal energy storage as part of its findings and recommendations.

*Additional submitted attachment is included below.*

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