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Additional submitted attachment is included below.

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Comments on the *Rulemaking to Adopt Regulations to Establish Standards for Flexible Demand Technologies for Appliances* - Docket No. 20-FDAS-01

Background

The stated purpose of the Rulemaking is to adopt regulations establishing standards and labeling requirements for appliances that promote flexible demand technologies, which can schedule, shift, or curtail electric demand of appliances, in order to reduce the greenhouse gases (GHGs) emitted in electricity generation.

WattTime supports this goal of maximizing the potential of flexible appliances to reduce GHGs. In addition, WattTime submits the following comments for consideration by the CEC to advance this goal:

Proposed regulations should be evaluated for its effectiveness in reducing GHGs

Senate Bill No. 49 requires the California Energy Commission (CEC) to facilitate the deployment of flexible demand technologies, as specified, and would require that those standards be cost effective and based on "feasible and attainable efficiencies or feasible improvements that will enable appliance operations to be scheduled, shifted, or curtailed **t**o reduce emissions of greenhouse gases associated with electricity generation." [Section 25402 (c)(1)(A) of the CA Public Resources Code]

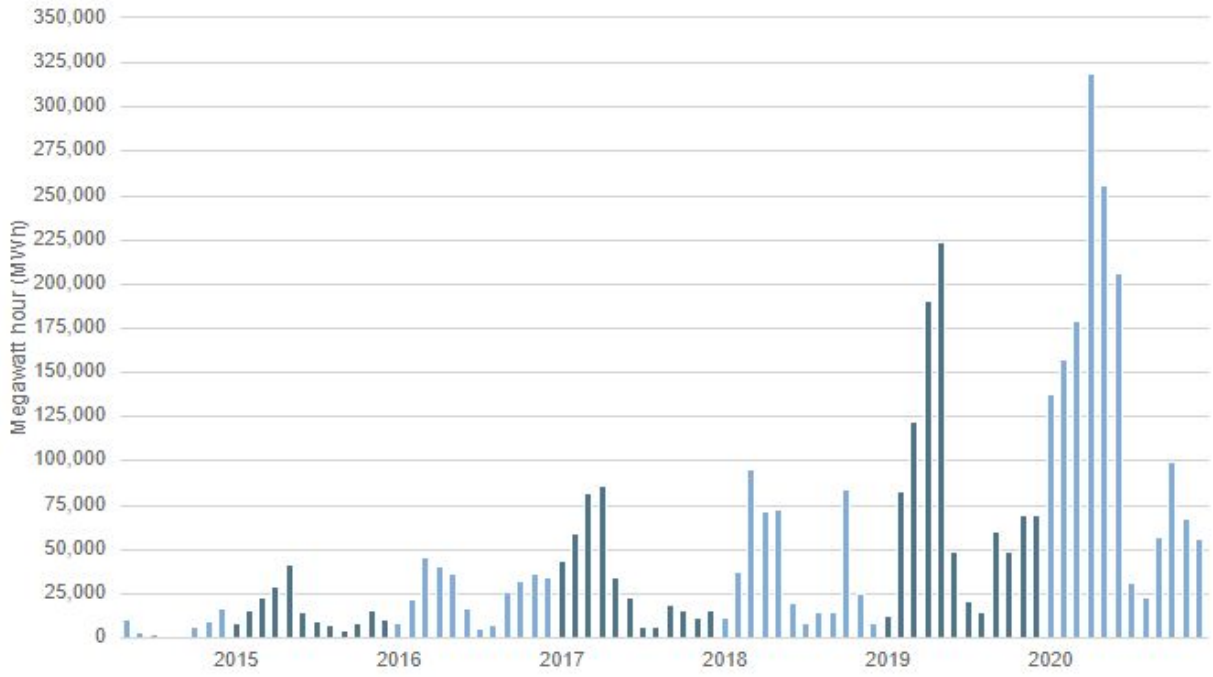
SB 49 is unequivocal that the central purpose of the flexible demand appliance standards are to reduce GHG emissions from electricity. As a result, any proposal under this rulemaking should primarily be evaluated on whether the standards can effectively maximize GHG reduction.

Standards should enable appliances to respond to a real time marginal emissions signal

Significant emissions savings can be achieved if appliances are able to respond to a time varying GHG signal. The variation in a marginal GHG signal provides additional opportunities for emissions savings beyond energy tariffs.

The emissions intensity of electricity delivered at a specific time and place can vary significantly depending on the marginal resource. When, for example, an EV is plugged in and begins charging, a power plant has to ramp up to meet that additional demand. The properties of these power plants, including efficiency and fuel type, determine the amount of emissions caused. For example, increasing demand for electricity when a combined cycle natural gas power plant is the marginal generator has less carbon impact than increasing demand when the marginal impact is a dirtier peaker plant or coal plant. Conversely, charging a vehicle when there is an overabundance of renewable energy in the form of hydro spill or solar curtailment can significantly reduce emissions by consuming excess renewable energy. In California, renewable curtailment is increasingly common and the flexible demand appliance standards can help reduce emissions by shifting load into these periods. Due to the nature of wholesale electricity markets, the marginal emissions of a grid can vary as often as every 5 minutes.

Figure 1: Wind and solar curtailment by month in CAISO

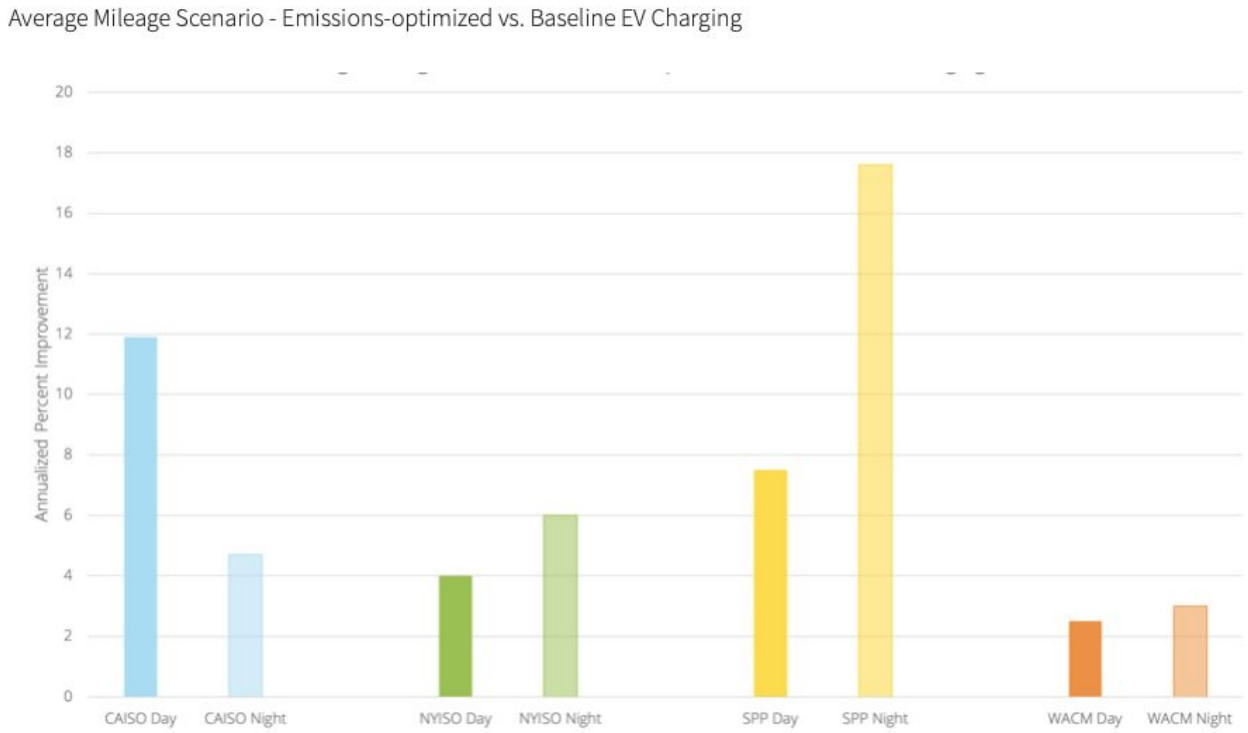


Source: CAISO

As a result, appliances being able to be automated to respond to a real time marginal GHG signal that can vary every 5 minutes is key to maximizing the potential of flexible loads reducing emissions.

WattTime research has shown that emissions-optimized appliance usage (in the example below, electric vehicle (EV) charging was considered) based on a GHG signal can reduce daily emissions of EV charging by up to 90% and annual emissions by 18%, over the baseline of non-emissions optimized charging, depending on the location.

Figure 2



Source: WattTime analysis (2019)

In fact, California's Self Generation Incentive Program has already enabled emissions-optimization for charge/discharge cycles of energy storage systems based on a real-time GHG signal with 5-minute granularity and 72-hour forecasts for integration into control systems. This signal enables systems to co-optimize for both emissions and revenue and ensure they are in compliance with the program requirements. Details on the signal can be found at sgipsignal.com.

The appliances that should be included under the standard are those whose operation can be shifted to a different timing of the day without sacrificing utility and comfort. Residential air conditioning, electrified hot water heating, and electric vehicle charging are among the biggest residential flexible loads where load management technology is readily available and can be integrated into operations to reduce emissions. Other potential appliances include IoT-enabled washing machines, clothes dryers, dishwashers, hot water heat pumps, dehumidifiers, refrigerators, and freezers, among others.

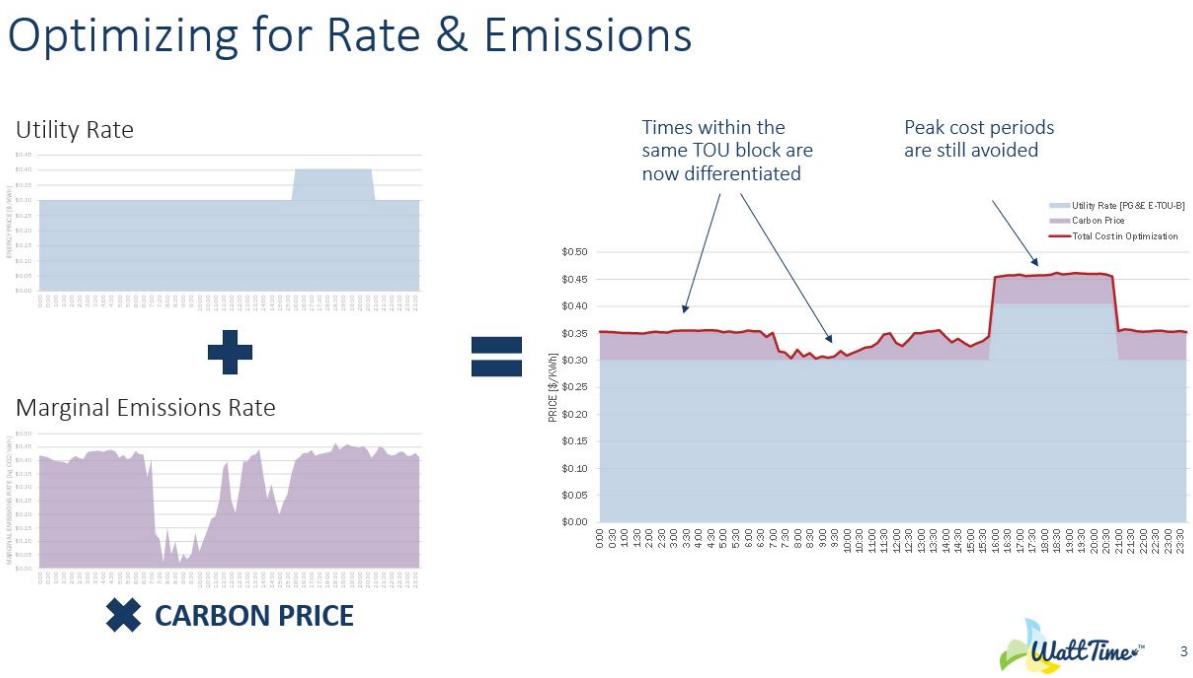
WattTime supports the use of labelling to inform consumers and promote the use of these appliances for load flexibility and emissions reductions.

Emissions reduction can be achieved without affecting consumer cost

Appliances can not only react to a GHG signal to modify their operation and reduce emissions, but emissions can also be co-optimized with cost to ensure that emissions optimization is also cost-effective to consumers.

In many cases, emissions savings can be achieved without affecting time-of-use (TOU) rate savings. Because the TOU blocks are undifferentiated, the cost of electricity within each block is the same. Using a GHG signal to optimize load within a TOU block achieves additional emissions savings without increasing energy bill costs. The following graphic illustrates one potential option for combining rates and emissions:

Figure 3



Cost of carbon should be considered when evaluating cost-effectiveness

SB 49 also requires that the flexible demand appliance standards should be cost effective. When determining the cost-effectiveness, it should be noted that the CEC may consider, among other factors, the value of increased or decreased emissions of greenhouse gases associated with the timing of an appliance's use. [Public Resources Code § 25402 (3)]. One option to fulfill this requirement is to use the social cost of carbon.

In fact, the California Public Utilities Commission (CPUC) issued a final order on May 16, 2019 requiring the use of the social cost of carbon for evaluating distributed energy resources (DERs).

Specifically, utilities must conduct a societal cost test (SCT) in resource planning that consists of three parts, one of which is the "avoided social cost of carbon."[1]

The standards under this rulemaking should also be aligned with the proposed amendments under the Load Management Tariff Standard Proceeding (Docket No. 19-OIR-01) to promote a demand flexible electricity market.

WattTime appreciates the opportunity to submit these comments, and looks forward to participating in the proceeding.

Submitted by

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About Us

WattTime is a California non-profit founded in 2014 that provides research, education, and assistance on the environmental benefits of electricity use timing, and advocates for a data driven approach to solving environmental problems. WattTime appreciates the opportunity to comment on these proceedings, and the initiative of the California Energy Commission (CEC) in instituting these proceedings.

[1] Rulemaking to Create a Consistent Regulatory Framework for the Guidance, Planning, and Evaluation of Integrated Distributed Energy Resources ("IDER") (Rulemaking No. 14-10-003).