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Additional submitted attachment is included below.

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November 1, 2021

Via Online Submission (Docket No. 20-FDAS-01)

J. Andrew McAllister
Commissioner
California Energy Commission
1516 Ninth Street
Sacramento, California 95814-5512

Re: Comments in Response to the September 1, 2021 Request for Information Flexible Demand Standards and the September 30, 2021 Pre-Rulemaking Draft of the Proposed Language for Flexible Demand Appliance Standards

Dear Commissioner McAllister:

GE Appliances, a Haier company ("GEA"), respectfully submits the following comments in response to the September 1, 2021 Request for Information Flexible Demand Standards ("RFI") and the September 30, 2021 Pre-Rulemaking Draft of the Proposed Language for Flexible Demand Appliance Standards ("Draft Standards"), Docket No. 20-FDAS-01.

GEA is a leading, US manufacturer of home appliances and equipment. GEA offers a full suite of major and portable household appliances across seven brands, a line of residential and commercial space conditioning products, and a line of residential water heaters. GEA has been a participant in and contributor to federal and California state energy regulatory programs for over 40 years.

GEA is a leader in providing connected features in the home appliance industry. Indeed, GEA has the largest number of connected major appliance products available to consumers today. GEA offers connected appliances in all major appliance categories including those with a built-in connected function as well as the ability to purchase adaptors to add connected features after purchase of an appliance. Connected appliances offer meaningful opportunity for reduction of energy consumption, which occurs both through greater consumer control over appliance operation and the incorporation of demand-response, or flexible demand, features.

GEA urges the commissioners to incorporate the feedback below as it develops Flexible Demand Appliance Standards ("FDAS") for the state of California. GEA supports the November 1, 2021 comments filed on this docket by the Association of Home Appliance Manufacturers ("AHAM") and makes these further comments.

1. Delay Timers and Connected Devices

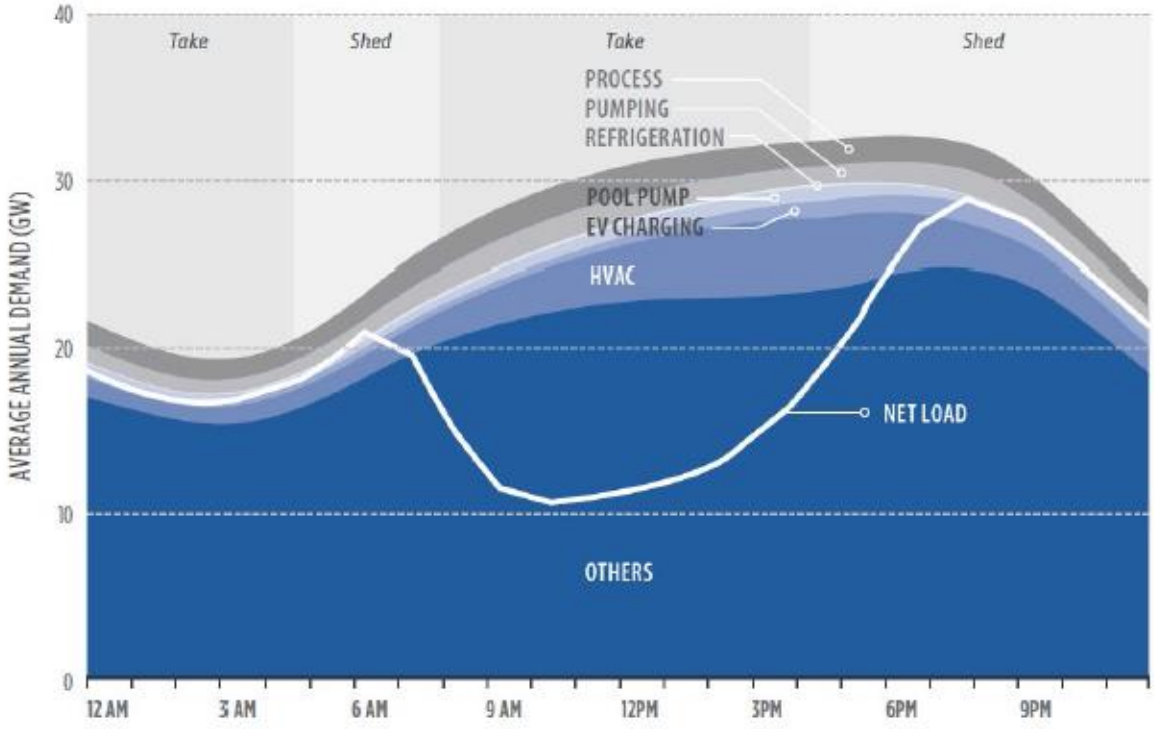
GEA generally concurs with the direction of the Draft Regulation and its focus on Connected Devices and Delay Timers as the model for California's flexible demand regulations. As GEA commented in response to the December 2020 Commissioner's Workshop, a cloud-to-cloud, API-based framework is the best model for flexible demand appliance standards[1] and California's primary reliance on Connected Devices to achieve its goals is appropriate. GEA's detailed comments in response to the Commissioner's Workshop regarding the benefits of the cloud-to-cloud model remain fully relevant to the RFI. While GEA supports the general model for flexible demand control CEC has set out in the Draft Regulation, GEA suggests revisions to both the definitions of Delay Timer and Connected Device.

As to the definition of Delay Timer, GEA believes a 24-hour delay period adds unnecessary, and therefore inappropriate, cost and complexity to appliances. GEA data demonstrates that consumers delay the start of their appliances only until the next practical time for them to interact with them. This typically means emptying the dishwasher and folding dry laundry are delayed either until the next morning or until a consumer returns home in the evening from work. CEC should use its own data from the Introduction to Flexible Demand Appliance Standards and seek only to push the use of electric clothes dryers and dishwashers into the next Take periods for the grid. As shown by CEC's own graph, excerpted below, the relevant Take periods are approximately 12:00 am to 4:30 am and 8:00 am to 4:00 pm.[2] This would generally require a delayed start capability of no more than 6 or 8 hours and reasonably allows for increments of up to 2 hours. Many products currently on the market offer a delayed start function that cycles through a delay of 2, 4, and 8 hours through the push of a single button. This simple, effective, and easy to communicate method of control is designed to increase consumer uptake of a product's delayed start feature and also reduces the cost of implementing the feature.

[1] TN# 236603, *available at* https://efiling.energy.ca.gov/GetDocument.aspx?tn=236603&DocumentContentId=69612

[2] Steffensen, et. al, Introduction to Flexible Demand Appliance Standards, CEC-400-2020-013 (November 2020) Figure 3 at 6, *available at* https://efiling.energy.ca.gov/GetDocument.aspx?tn=235899&DocumentContentId=68859

Figure 3: Average Annual Load Shape with Shift able Load Uses



Source: CPUC Working Group on Load Shift January 31, 2019

In the Draft Regulations, CEC has defined a Connected Device to mean a device "capable of connecting to the internet." GEA understand this definition to include appliances that are capable of connecting to the internet through an optional adaptor. GEA requests that CEC clarify the definition to remove any ambiguity on this issue. To the extent CEC intended to exclude devices capable of connecting to the internet with adaptors (that is, to allow only "connected-ready" appliances), GEA objects to the definition in the Draft Regulations. SB 49 requires that CEC develop FDAS regulations that prioritize consumer interest and benefits and that are limited to consumer opt-in participation.

As SB 49 anticipates and GEA's own experience indicates, many consumers simply will not be interested in flexible demand features for certain appliances, even with the financial incentive of time of use pricing. It makes little sense to force all California consumers to purchase connected-ready appliances when they have no intention of using that quite expensive feature. Connected capable machines, instead, allow consumers who do not intend to use load shifting features at the time of purchase avoid a state-mandated expense from which they will receive no resulting benefit while ensuring those consumers can be incentivized in the future to connect through programs such as utility rebates for adaptors, changes in time of use pricing over time as that system matures and hyper-localizes, and home-based solar system installs that incentivize careful load management.

2. Electric Clothes Dryers

GEA opposes all mandatory flexible demand requirements for electric clothes dryers because there is ample reason to believe consumers are uninterested in such a product feature and there is no data of which GEA is aware indicating that consumers would adopt time shifting habits even if given the option to do so. The primary issue with delayed start for clothes dryers is that consumers, for good reason, simply do not like to leave wet clothes sitting wet. Clothes develop smells due to the growth of mold and mildew when left wet and they can get damaged. Moreover, smelly clothes lead to increased energy use when consumers re-wash them.

SB 49 requires that any flexible demand standards be limited to consumer opt-in methods, and CEC has no evidence consumers will opt to delay drying their wet clothes. Indeed, as GEA shared with CEC staff previously, many GEA electric dryers already have a delayed started feature. Many thousands of those electric dryers with delayed start are connected dryers in the homes of California consumers. Of those thousands of units, less than 0.75% of California consumers have used the delayed start feature on their electric dryer more than 5 times and of all cycles run on connected electric clothes dryers in California, only 0.06% of all cycles run used delay start.

In addition to a lack of consumer interest in Delayed Start, the Draft Regulations would have a substantial impact on California consumers by excluding an entire category, the lowest cost category, of electric dryers from California consumers: electromechanical control dryers.

One way electric clothes dryers can be grouped is based on their method of control: electromechanical control and electronic control. Those control methods are defined below.

A. Electromechanical Control: Products whose cycles and operation are controlled completely without integrated circuits, more commonly known as computer chips. These products use primarily motor driven timers as well as analog sensors to control product operation.

B. Electronic Control: These products incorporate integrated circuits into the control mechanism for the product while they may continue to use some electromechanical or analog components.

Electromechanical control dryers are less expensive than electronic control dryers, provide simpler controls, and provide a straight-forward, familiar, and comfortable control system for consumers. In addition, many consumers perceive electromechanical control dryers to be more reliable than electronic control dryers and/or prefer them for the nature of the repair process as compared to electronic control dryers.

Electromechanical control dryers cannot practically be converted to act as connected appliances. Indeed, connected appliances capable of having an IP or Bluetooth address by their very nature require electronic control circuit boards. While, theoretically, some form of electronic monitoring and control of otherwise electromechanical controls could be created, practically, if an electric dryer must be connected capable, it will be converted to electronic control, or simply not sold in California given the presence of other electronic control products on the market.

Electromechanical control dryers also cannot practically be converted to have delay timers. Indeed, GEA is not aware of any electromechanical control dryer currently on the market with a delay timer. While adding a delay timer to an electromechanical control dryer is certainly technologically feasible, the added cost of doing so means that, practically, the dryer would simply be converted to an electronic control model, or, again, simply no longer sold in California altogether.

Requiring that all dryers be connected appliances and/or have delay timers will practically exclude electromechanical control dryers from California consumers. Given the significant price difference between electromechanical control products and even the least expensive dryers with delay timers and connected functionality, CEC will, at a minimum, need to justify this significant imposition of cost on California consumers with a cost benefit analysis showing a reasonable payback period. More on this cost adder is in section 5(D) below. Even then, however, given the good reason to believe that California consumers are uninterested in delaying electric dryer start times, mandating that all electric dryers have delayed start and/or be connected will do little to create load shifting behavior while reducing product availability and adding significant additional cost for California consumers.

Should CEC still believe the electric dryers are an appropriate initial product for FDAS regulations, GEA suggests the following requirements: electronic control electric dryers only must either (1) have a delay timer or (2) be a connected device (consistent with GEA's comments regarding the definition of connected device, above.)

3. Dishwashers

Unlike clothes dryers, there is some evidence that consumers use and value the ability to delay start their dishwashers. Consumers currently delay start dishwashers to address issues such as noise and the potential for competing water consumption in the home. Unlike electric dryers, however, the potential impact on grid power is quite small for residential dishwashers. As the CEC's own recently released 2019 California Residential Appliance Saturation Study (RASS) shows, residential dishwashers are among the lowest overall consumers of electricity in the home. Dishwashers have the second lowest UEC of all appliance's surveyed with a UEC only 84 and a saturation rate of 67%.[3] CEC's chart summarizing this data is excerpted below.

[3] Palmgren, et al., 2019 California Residential Appliance Saturation Study (RASS), CEC-200-2021-005 (August 4, 2021) Executive Summary at 6, *available at* https://www.energy.ca.gov/sites/default/files/2021-08/CEC-200-2021-005-ES.pdf

	All UEC	All Saturation
Household Total UEC	6,174	39,682 homes
Primary Conventional Space Heating	953	15%
Primary Heat Pump Space Heating	768	4%
Auxiliary Space Heating	489	7%
Furnace Fan	130	64%
Attic Fan	152	2%
Central Air Conditioning	1,163	59%
Room Air Conditioning	620	17%
Evaporative Cooling	890	10%
Water Heating	1,792	6%
Solar Water Heating	1,295	0%
Dryer	502	32%
Clothes Washer	89	78%
Dishwasher	84	67%
First Refrigerator	1,130	100%
Additional Refrigerator	1,081	27%
Freezer	840	17%
Pool Pump	2,895	9%
Spa	314	8%
Outdoor Lighting	224	60%
Range/Oven	350	47%
Television	462	64%
Spa Electric Heat	1,015	4%
Microwave	150	87%
Home Office Equipment	51	16%
Personal Computer	272	82%
Well Pump	1,346	4%
Electric Vehicle	971	6%
Miscellaneous	1,769	100%
Dwelling Type Averages	*All Types*	
Average Dwelling Size	*1,567*	
Average Number of Residents	*2.9*	
Percent of Population	*100.0%*	

There is, therefore, little to no justification for including dishwashers in this initial round of FDAS regulations, when, as CEC's own findings show, products such as electric water heaters, pool pumps, and HVACs will have a much more significant impact on shifting electricity time of use.

To the extent that CEC does move forward with including dishwashers in its FDAS regulations, GEA's comments as to the definitions of Delay Timer and Connected Device, above, are particularly relevant. Because of the constant cycle of dish use and cleaning in the home, consumers are particularly unlikely to delay the use of a dishwasher beyond the time of the next meal. GEA's own connected data show that consumers using delay start essentially never delay a cycle to the point where it will end beyond the next meal. That is, consumers will delay a start until the night when showers are done and individuals are in bed to be emptied the next morning or they will

delay a start until those leaving the house are done and out the door to be emptied at lunch or dinner.

In addition, only the highest-end dishwashers on the market are currently connected-ready at the time of purchase and the price difference between these and low-cost options are significant. Conversely, almost all dishwashers on the market are electronic control, and the costs to make such models connected capable with the purchase of a separate adaptor are reasonable and can be done with little impact to consumer cost. In addition, as noted above, given the limited time shift practices for dishwashers, there is no justification for requiring that dishwashers both have a Delay Timer AND be Connected Devices. CEC's objectives can be met and consumer cost can be limited through a requirement that dishwashers either have a Delay Timer OR be Connected Devices.

4. Cybersecurity

The Draft Standard has appropriate cybersecurity and connectivity protections. GEA reads the provisions in Section 1691(b) to apply to CEC's standards and technologies developed therein and not to the regulated appliances generally. The North American Reliability Corporation's Critical Infrastructure Protection Standards are inappropriate for connected appliances generally. This is particularly true under the cloud-to-cloud, API-based model GEA and AHAM support through this process.

Nonetheless, GEA continues to support the model cybersecurity language proposed by AHAM and AHRI. This model promotes a combination of flexibility and rigorousness appropriate for this complex space. In particular, GEA recommends that CEC include UL's cybersecurity verification program implemented under UL standard MCV 1376 in the cybersecurity models listed in Table 8 of the RFI. UL's cybersecurity verification program is an industry leader in ensuring the appropriate data protection and device protection for home appliances.

5. Other Matters

A. Definition of Basic Model: In Section 1687, CEC defines a collection of appliances using the same method for compliance with FDAS requirements as a basic model. Basic model is already an important defined term in the appliance energy regulatory space, as it is the fundamental unit of registration for products with identical or near identical energy consumption profiles. Reusing this term to mean something different will only lead to many years of frustrating ambiguities. Any different but reasonable term would work. GEA suggests Flexible Demand Family.

B. Reporting Database: The draft regulations appear to propose a registration database independent of the existing CEC database and reporting system for appliances and equipment. The FDAS regulations should not create a separate database and reporting requirement and thus a duplicate burden on

manufacturers. CEC should simply add FDAS parameters to its already comprehensive appliance reporting system.

C. 12 Months Test Experience Requirement: Section 1688(a)(1)(A) requires that for a lab to be qualified to test it must have completed tests using the applicable test method within the previous 12 months. This requirement prevents new labs from coming online and could even be read to prevent any lab from starting testing if CEC develops an entirely new test method. This is currently a moot issue as the Draft Regulations do not place a test requirement on any of the proposed covered products. Nonetheless, it could become an issue in the future.

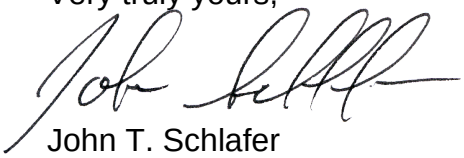
D. Table 3 Cost Data: CEC does not provide the source of the cost data included in Table 3 of the RFI or the analytical method used to assess the data, but CEC appears to significantly underestimate the added retail cost for the features indicated in the table. GEA does not set retail prices for products sold by its customers, but it does establish manufacturer suggested retail prices. It is important to note that retail price shifts for individual features rarely exist in isolation in the appliance market, and many factors related to consumer preferences and the combinations of features influence price. Nonetheless, GEA believes the below retail price differentials are representative of the cost adders California consumers would experience when compared to current low-cost models available today.

Dishwasher	
Approach	Incremental Cost
Delay Capability	$10
Scheduling and Clock Capability **(Through Connected Features)**	$50
Connected Appliance **(Connected Ready)**	$50
Open Automated Demand Response (OpenADR)	$50
American National Standards Institute/ Consumer Technology Association (ANSI/CTA) 2045	$100
FM Broadcast	$150

Clothes Dryer	
Approach	Incremental Cost
Delay Capability	$50
Scheduling and Clock Capability **(Through Connected Features)**	$100
Connected Appliance **(Connected Ready)**	$100
Open Automated Demand Response (OpenADR)	$100
American National Standards Institute/ Consumer Technology Association (ANSI/CTA) 2045	$100
FM Broadcast	$150

GEA appreciates the opportunity to provide these comments. Please do not hesitate to contact me with any questions or concerns.

Very truly yours,



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