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SCE Comments on California Energy Commission Flexible Demand Appliance Standards

Additional submitted attachment is included below.

SOUTHERN CALIFORNIA EDISON®
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Dawn Anaiscourt,
Director, Regulatory Affairs – Agency Relations

February 3, 2021

California Energy Commission
Docket Office, MS-4
Re: Docket No. 20-FDAS-01
1516 Ninth Street
Sacramento, CA 95814-5512
docket@energy.ca.gov

Subject: **Southern California Edison Company's Comments on California Energy Commission Flexible Demand Appliance Standards, Docket Number 20-FDAS-01**

Dear Commissioners:

On December 14, 2020, the California Energy Commission (CEC) conducted the *Lead Commissioner Workshop on Senate Bill 49 Flexible Demand Appliance Standards* (Workshop) to present and discuss the Senate Bill 49 (SB 49) Flexible Demand Appliance Standards. The pre-rulemaking Workshop included a staff presentation, and presentations from various stakeholders. The CEC is now seeking comments on both the workshop presentations as well as the SB 49 regulatory framework setting and proposed regulatory language.

Southern California Edison Company (SCE) has published white papers outlining its path to meet the decarbonization and clean energy goals set forth by the State of California (State). In November 2019, SCE published its "Pathway 2045," a data-driven analysis of the steps that California must take to meet the 2045 goals to clean our electricity grid and reach carbon neutrality. Pathway 2045 dedicates an entire section to the importance of building electrification, including building space and water heating and cooking.[1]. In December 2020, SCE published another white paper, "Reimagining the Grid." This paper is a comprehensive assessment of how the grid must change to support California's greenhouse gas reduction goals, while also adapting to other needs driven by customers and climate change. Reviewing these white papers could be useful to CEC staff members as they enter this rulemaking process.

Demand Response (DR) has historically focused on meeting customer needs and maintaining grid stability during times of grid stress or high prices. Over the past decade, however, the needs of the grid have evolved to require a more dynamic and complicated set of flexible solutions: there are now over one million solar rooftop installations in use, the State is projected to have 5

[1] Please see p. 11 of Pathway 2045 for a discussion of building electrification and demand flexibility.

million electric vehicles by 2030, and customers are now embracing behind the meter batteries paired with solar as an additional distributed energy resource. This energy market evolution has created various opportunities as customers embrace new technologies such as smart home systems, while also creating energy market challenges such as the duck curve and curtailment due to oversupply of renewable generation. SB 49's intent to address those opportunities and challenges can help maintain provision of safe, reliable, affordable electricity while decarbonizing California's economy.

Understanding the importance of flexible demand from the perspective of California's decarbonization goals, SCE appreciates the opportunity to submit written comments on the workshop, as set forth below.

1. **SCE supports the use of OpenADR, an open and two-way communication standard, for flexible demand or demand response.**

SCE's DR portfolio plays an important role in managing the electric grid, especially in times of high electricity use. SCE's existing DR programs include participation by more than 500,000 customers and can provide up to 800 MW of load reduction. Cost-effectiveness is an important element of the DR portfolio and programs are consistently evaluated to maintain cost-effectiveness. SCE focuses on providing customer choice when it comes to selecting a DR program or end use devices to participate in DR and supports the use of open standards and technology-agnostic solutions.

The preferred secure and open communication protocol for initiating DR events at SCE is OpenADR 2.0b. OpenADR is used in most of SCE's DR programs and provides the flexibility to reach energy management systems directly at large commercial sites as well as tens of thousands of residential devices through the cloud by working with third party vendors. The flexible architecture of OpenADR makes it possible to reach virtually any end-use device that has communication capabilities. SCE continually evaluates devices that may be used as cost-effective resources in the DR portfolio. Therefore, **SCE recommends that the CEC consider existing DR programs and their existing DR infrastructures when evaluating the cost-effectiveness of proposed flexible demand measures or standards**. When adopting flexible demand measures or standards that require DR infrastructure upgrades by the energy service providers (such as investor-owned utilities, public-owned utilities, or Community Choice Aggregators), the cost of a new infrastructure or system upgrade needs to be considered as a part of determining cost-effectiveness.

2. **SCE recommends the CEC align this flexible demand proceeding with the ongoing Title 24 efforts.**

Currently, the CEC is working on 2022 Title 24 code and recognizes Heat Pump Water Heaters (HPWHs) as an additional distributed resource. HPWHs have the capability to shift load to off-peak periods. HPWHs can enhance grid management because they are flexible as to when they draw power from the grid; the draw time from the grid can be strategically controlled without any disruption to the customer at times of the day when power is cheaper and cleaner (e.g., mid-day when solar power is available)), and the device can serve as thermal storage of energy

supplied at other times of the day.[2] On July 8, 2020, the CEC adopted a specification for demand-shifting in HPWHs, known as Joint Appendix 13 (JA13). The JA13 specification is intended to support and increase the market adoption of load-shifting HPWHs in California. JA13 provides the qualification requirements for a HPWH demand management system. The CEC should align HPHW flexible demand standards with the performance standards set forth in Title 24 and JA13.

3. CEC should align this effort with the Title 24 Part 6 Code Development.

SCE recommends the CEC align this proceeding with its 2022 Title 24 Part 6 efforts. The Investor-Owned Utilities (IOU) Statewide Codes and Standards program has proposed several measures for adoption into the 2022 building energy code that would increase grid harmonization of newly constructed buildings though DR functionality. In addition to JA13 described above, these measures include:

- Demand Flexibility credit for installation and proper programming of a Pre-Cooling Thermostat (PCT);
- Exception to the solar zone credit when a Home Energy Management System (HEMS) is installed in combination with a smart thermostat;
- Compliance credit for additional types of thermal energy storage (TES) systems including Ice-on-Coil Internal Melt, Ice-on-Coil External Melt, and Eutectic Salt;
- Outdoor lighting Demand Management; and
- Alternative compliance path to allow a load management strategy that limits the capacity of HVAC variable speed compressors.

SCE recommends that the CEC include appliances and technologies that are affected by these DR measures as part of its evaluation in this rulemaking. Flexible demand appliance standards can help ensure that newly constructed buildings equipped with these technologies will be able to participate in load flexibility programs.

4. HVAC systems can provide flexible demand response.

Pathway 2045 calls for 70 percent of space and water heating to be electric by 2045. To achieve this challenging goal, decarbonization and DR programs are key to customer adoption by replacing their fossil fuel space and water heating equipment. HVAC systems, specifically variable capacity heat pumps, can provide flexible demand response. AHRI 1380[3] has been developed to support DR strategies to benefit the grid using standardized communication protocols, either CT-2045-A or OpenADR 2.0. To ensure connectivity and functionalities of the technology, it will be beneficial to work with standard-setting bodies, like AHRI and Energy Star, as they are updating or creating new guidelines. Prior to the adoption of a standard, it will be beneficial to develop case studies to understand and validate the technology.

[2] Beneficial Electrification of Water Heating, https://www.raponline.org/knowledge-center/beneficial-electrification-of-water-heating/

[3] https://www.ahrinet.org/App_Content/ahri/files/STANDARDS/AHRI/AHRI_Standard_1380_I-P_2019.pdf

5. SCE recommends the CEC align this proceeding with the SB 676 rulemaking, which is being led by the California Public Utilities Commission.

Flexible demand Electric Vehicle Charging (EVC) is one of the technologies needed to meet Vehicle Grid Integration (VGI) under California's SB 676.[4] In this legislation, the California Public Utilities Commission (CPUC) is required to develop and implement VGI technologies, strategies, pilots and programs. On December 21, 2020, the CPUC issued a "Decision Concerning Implementation of Senate Bill 676 and Vehicle-Grid Integration Strategies" as a framework to achieve these goals.[5]

As a lead up to this effort, the State's IOUs participated in and managed a series of VGI workshops to define EVC requirements to allow EV participation in VGI to benefit the grid, integrate Distributed Energy Resources (DER), reduce Green House Gas (GHG) emissions, and reduce the cost of EV charging to consumers.[6] Ordering Paragraph 19[7] of the Decision also requires SCE to prepare a workplan for a cybersecurity gap analysis that would consider EV charging equipment products used for transportation electrification programs, including distributed and cloud computing, networking, and communications. To reduce confusion and redundancy, the CEC should not establish a workstream for flexible demand EVC as part of SB 49 rulemaking and should instead participate and align with the CPUC's SB 676 effort.

6. CEC should consider equity and connection access affordability when mandating a flexible demand standard.

According to Marti Frank's study,[8] less than 30% of low-end (i.e., $600 or less) white appliances are ENERGY STAR® while more than 70% of mid- to high-end white goods are ENERGY STAR. This market phenomenon may create an undesirable outcome: an equity issue. The same study reveals that the upper-income customers (annual incomes over $100,000[9]) purchase ENERGY STAR white appliances at a significantly higher rate compared to lower-income (e.g., annual incomes less than $50,000) customers. Therefore, the first cost is an important factor for

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[4] *See*: https://leginfo.legislature.ca.gov/faces/billTextClient.xhtml?bill_id=201920200SB676

[5] *See generally* Decision 20-12-029.

[6] *See*: https://gridworks.org/initiatives/vehicle-grid-integrationwg/ for details on the VGI Working Group effort, and outputs of the work shop including policy recommendations for the integration of flexible EVC into the electric grid. In addition to the IOUs, Original Equipment Manufacturers (OEMS) stakeholders, the CEC and other policy makers were active participants of this effort.

[7] *See*: https://docs.cpuc.ca.gov/PublishedDocs/Published/G000/M355/K104/355104591.PDF pp.85-86 where it states: "Southern California Edison Company shall prepare a workplan for a cybersecurity gap-analysis, as described by this decision, including the preparation of a public version with non-confidential information and confidential version for review by the Commission's Energy Division. Southern California Edison Company shall propose its workplan and work schedule via a R.18-12-006 COM/CR6/gp2 PROPOSED DECISION (Rev.1) 86 Tier 2 advice letter filed no later than 180 days after the effective date of this decision." SCE plans to deliver this workplan by June 19, 2021.

[8] Slide 17, Marti Frank et al, "A Collective Approach to Increase Equity in the Appliance Market," 2020 ACEEE Summer Study

[9] https://www.aceee.org/blog/2016/11/how-residential-utility-programs

lower-income customers, and CEC should consider equity impacts before adopting a requirement for any mandatory "flexible" demand functionalities or standards on white appliances.

The requirement of having Wi-Fi connection for the flexible demand can be an additional challenge as well. The cost-effectiveness assessment should reflect the ongoing operational cost of maintaining the Wi-Fi connection access.

7. Intelligent pool pump controlled with an integration OpenADR provides shifting and shedding opportunities.

There were 486,000 residential in-ground swimming pools and pumps in SCE territory in 2012 (1.2 million total in California),[4] in addition to a significant amount of auxiliary booster pumps (for inground pool cleaners). The CEC Codes and Standards requirements for multi-speed pumps initiated the opportunity to move away from manual/fixed timeclock controls to advance control devices that are connected electronically through computers and/or cell phone apps. As residential electrification advances, pool owners may convert existing gas pool heaters to heat pump pool heaters. Industry is working to offer firmware to be uploaded to existing advanced controllers to incorporate additional control point(s) and/or telemetry. The integration of OpenADR intelligent pool controller applications provides not only a response to shifting or shedding loads but potential responses to price signals while maintaining pool performance and customer satisfaction.

8. OpenADR meets NIST cybersecurity standards.

Among other requirements, SB 49 calls on the CEC to adopt, by regulation, and periodically update, standards for appliances to facilitate the deployment of flexible demand technologies and requires that those standards be cost effective. In adopting these flexible demand appliance standards, the CEC is directed to consider the National Institute of Standards and Technology's reliability and cybersecurity protocols, or other cybersecurity protocols that are equally or more protective, and shall adopt, at a minimum, the North American Electric Reliability Corporation (NERC)'s Critical Infrastructure Protection (CIP) standards. SCE notes that OpenADR meets the National Institute for Standards and Technology cybersecurity requirements and has rigorous security certification policies and processes in place. Therefore, cybersecurity is already being addressed for any appliances that use OpenADR as the preferred communication protocol.

9. We recommend CEC consider performance or functional requirements of flexible demand instead of adopting prescriptive cybersecurity standards for smaller appliances.

Smart home technologies, such as Amazon Alexa and Google Home, are still emerging, and some other Wi-Fi networking equipment and routers are found to be more vulnerable to cyber-attacks than others, especially when the average devices did not get any security fixes within one year.[10] Therefore, we recommend CEC consider performance-based standards (or requiring specific functionalities).

[10] P. 6, Peter Weidenbach, et al, "Home Router Security Report 2020," June 2020

Additionally, regarding SB 49's directive that the CEC adopt, at a minimum, the North American Electric Reliability Corporation (NERC)'s Critical Infrastructure Protection (CIP) standards, SCE notes that NERC is a non- profit entity whose mission is to ensure the reliability of the North American Bulk Electric System (BES). NERC establishes and enforces mandatory Reliability Standards for the region's power grid and the management of cyber assets that support the safe and reliable operation of the BES. Within NERC's Reliability Standards are the CIP standards specified by SB 49. The CIP standards are developed to address the security of BES Cyber Systems and Assets essential to electric power grid operation. The CIP standards help secure these systems from cybersecurity threats that could lead to extended service outages or equipment damage.

Electric utilities operating cyber assets that fall under the CIP standards spend significant sums of money on their compliance programs and associated personnel and equipment. The level of investment that would be required by flexible demand appliance manufacturers to ensure that their corporate practices and appliances offered for sale comply with all of the NERC CIP standards would likely be passed on to end users and consumers and make it no longer cost effective to consumers to purchase and use such products. Furthermore, NERC's CIP standards are specifically designed to protect the BES and may not be appropriate or applicable to flexible demand appliances.

SCE looks forward to working with the CEC as it reviews approaches taken by industry and government to develop voluntary cybersecurity standards and any recommendations for cybersecure communications protocols for flexible demand technologies and appliances.

10. Conclusion

In conclusion, SCE recommends the CEC set priorities not just based upon the demand response market potentials, but also based upon consideration of technology maturities, such as manufacturers that are implementing CTA 2045 with OpenADR 2.0b unitary water heaters at this moment, but the market has not fully tested;, safety, like emergency batteries for medical equipment should be exempted from having "Opt-In" as the default mode; customer choice, and various benefits of having voluntary standards first or wait until market matures prior to having CEC mandated standards.

SCE thanks the CEC for consideration of the above comments and looks forward to its continued partnership with stakeholders throughout the rulemaking.

Sincerely,

/s/ Dawn Anaiscourt

Dawn Anaiscourt
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Southern California Edison Company