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January 22, 2021

Ryan Fogle
Office of Air and Radiation
U.S. Environmental Protection Agency
1200 Pennsylvania Avenue
Washington, D.C. 20460

Topic: Version 2.0 Discussion Guide on ENERGY STAR® Small Network Equipment Test Method and Specification

Dear Mr. Fogle:

This letter comprises the comments of the Pacific Gas and Electric Company (PG&E), San Diego Gas and Electric (SDG&E), and Southern California Edison (SCE) in response to the United States (U.S.) Environmental Protection Agency (EPA) Discussion Guide on Small Network Equipment (SNE), which poses questions to be addressed in Version 2.0 of the ENERGY STAR SNE Test Method and Specification (SNE Version 2.0).

The signatories of this letter, collectively referred to herein as the California Investor-Owned Utilities (CA IOUs), represent some of the largest utility companies in the Western U.S., serving over 32 million customers. As energy companies, we understand the potential of appliance efficiency standards to cut costs and reduce consumption while maintaining or increasing consumer utility of products. We have a responsibility to our customers to advocate for standards that accurately reflect the climate and conditions of our respective service areas, so as to maximize these positive effects.

We strongly support EPA's efforts to revise the current SNE Test Method and Specification (SNE Version 1.0), which have been effective since 2013. Since then, the new product types and communication protocols have appeared on the market, and consumer demands on their SNE products have increased. Yet with only two products listed on the ENERGY STAR SNE qualified products list, consumers currently have few choices for energy efficient SNE products when purchasing from retailers or obtaining SNE products from service providers.

EPA published a Discussion Guide in December 2020, outlining their proposal to align applicable aspects of the ENERGY STAR SNE Test Method and Specification¹ with the European Union Code of Conduct on Energy Consumption of Broad Equipment: Version 7.0 (EU CoC).² EPA provided additional details

¹ EPA Discussion Guide:

<https://www.energystar.gov/sites/default/files/ENERGY%20STAR%20Version%202.0%20Small%20Network%20Equipment%20Discussion%20Guide.pdf>.

² EU CoC: <https://e3p.jrc.ec.europa.eu/publications/eu-code-conduct-energy-consumption-broadband-equipment-version-7>.

on the proposal in a webinar on January 7, 2021.³ Below, we provide feedback to some of the questions posed in the Discussion Guide and webinar:

1. The CA IOUs urge EPA to include SNE products that are installed on U.S. consumer premises, including those purchased by consumers through retail channels and those provided to consumers by service providers, in SNE Version 2.0 scope.

EPA asks for feedback on aligning the SNE specification scope with that of the EU CoC, specifically select product categories that are explicitly covered by the EU CoC but not SNE Version 1.0. Broadly, the CA IOUs recommend that EPA maintain a scope similar to SNE Version 1.0, which includes both broadband access equipment and local network equipment that is installed on consumer premises. This scope aligns with the U.S. Voluntary Agreement for Small Network Equipment⁴ (SNE VA) and, based on our experience, appears to align with the U.S. market in general.

The U.S. market has evolved since EPA developed SNE Version 1.0, in response to an increase in the number and type of edge products that connect to local area networks (LANs), often via wireless technologies. The SNE market has responded with new product types like wireless network range extenders and mesh Wi-Fi systems to improve wireless coverage on a LAN. These network-extending product types are gaining market share and should be added to EPA's scope. Market data obtained by the CA IOUs indicates that U.S. shipments of whole-home Wi-Fi systems, for example, will reach about 10 million units in 2021, with continuing growth.⁵ The CA IOUs recommend that EPA add these products to the Version 2.0 scope.

EPA also asks feedback on whether digital subscriber line (DSL) modems and integrated access devices (IADs) should remain in scope, citing declining market share and little differentiation in power draw according to EPA testing. Market data obtained by the CA IOUs confirms declining market share of DSL equipment from about 15,000 units in 2016 to 8,000 units in 2024.⁶ We note some differentiation in Asymmetric DSL IAD power draw reported to the SNE VA; power draw of the four models with nearly identical functionality reported in 2019 ranged from 4.2 to 6.1 watts,⁷ indicating some differentiation. Very high-speed DSL models reported to the SNE VA in 2019, on the other hand, show little differentiation, and only one G.fast⁸ DSL model was reported.

Based on these data, the CA IOUs have no recommendation about removing DSL equipment from the scope in Version 2.0, but we look forward to reviewing the EPA dataset and any other information brought forward by other stakeholders. In addition, the CA IOUs have no recommendations regarding other potential product categories in the EU CoC that the EPA is considering for their scope, and we look forward to reviewing information provided by other stakeholders and EPA. In general, we encourage EPA to adopt a scope and approach that is as simple as possible while still recognizing and differentiating characteristics of SNE products on the U.S. market.

³ <https://www.energystar.gov/sites/default/files/SNE%20V2.0%20Discussion%20Guide%20Webinar%20Slides.pdf>.

⁴ <https://www.energy-efficiency.us/library/pdf/SNE-VoluntaryAgreement.pdf>

⁵ See CA IOU Codes and Standards Enhancement Team white paper on SNE energy savings opportunities, Figure 6: <https://efiling.energy.ca.gov/GetDocument.aspx?tn=235563&DocumentContentId=68495>

⁶ Informa Tech. 2020 Home Network Intelligence Service Broadband Consumer Premises Equipment Market Tracker Database.

⁷ Source: SNE VA 2019 Annual Report. <https://www.energy-efficiency.us/library/pdf/SNE-AnnualReport-2019.pdf>

⁸ International Telecommunication Union's Telecommunication Standardization Sector's G series of recommendations.

2. **The CA IOUs believe EPA should adopt or develop a relatively small number of base power allowances and functional adders that appropriately segment and credit products by their functionality.**

The CA IOUs agree with EPA's goal to use significantly fewer base power allowances and functional adders than the EU CoC. Related to the test setup and test conditions discussion in the next section, we recommend that adders for network interfaces and other functions should only apply if they are connected or active during testing. We do not have specific recommendations on base allowance and functional adders at this time but plan to participate in related upcoming discussions.

3. **EPA, U.S. Department of Energy (DOE), and stakeholders should first agree on which SNE power measurements are useful to collect, then determine which elements of the EU CoC test procedure and SNE Version 1.0 test method are relevant.**

To reduce manufacturer test burden under SNE Version 2.0, EPA is considering aligning the test method with the EU CoC test procedure. Such an alignment would reduce the number of required tests for an SNE product from up to nine to two or three. Although we agree that reducing test burden is likely a necessary step to increase participation in the ENERGY STAR program, the CA IOUs recommend that EPA, DOE, and stakeholders first jointly determine which metrics are most useful for assessing energy efficiency and estimating real-world energy use of SNE products in the U.S. market. Those metrics should decide which test procedures should be used, rather than the test procedure determining the metrics that can be used in Version 2.0.

The CA IOUs recommend developing a suite of tests that allows EPA and stakeholders to assess the energy efficiency of a product and its approximate real-world energy usage. Ideally, the test suite should:

- a. Measure net power draw of the network interfaces and other functions in the product, in part to encourage efficient implementation of all technologies within the product.
- b. Give insight into how the product scales power to the data rate.
- c. Approximate real-world test setup and data rates so that product energy use can be estimated.

To accomplish the above objectives, we recommend that EPA and DOE consider adopting a suite of three tests that include:

- i. **EU CoC On mode test, potentially with modifications to reduce test burden.**
This test would measure the product in its most fully powered and feature-rich state, passing maximum (or near maximum) allowed traffic. This test, combined with appropriate base allowances and adders, could help encourage that all interfaces and other features within the product are efficiently implemented. Modifications to reduce test burden could include reducing the number of connected interfaces or operational functions, but we recommend that products or functions that are not active during this test should not receive applicable adders in SNE Version 2.0.
- ii. **A high data rate test that approximates real-world setup.**
The CA IOUs agree with stakeholders who noted during the January webinar that the EU CoC On mode test does not represent a real-world usage scenario. Therefore, we recommend that EPA and DOE require a high data rate test in which a limited number of network interfaces are connected to approximate how the product may be used in reality. A challenge with this approach is deciding how to approximate a real-world interface setup. EPA and DOE accomplished this in SNE Version 1.0 by using a prioritized list of interface protocols to test and specify the number of interfaces to connect. A similar

approach, updated based on interfaces present in current SNE products, could be used here.

iii. **A low data rate test that approximates real-world setup.**

This test would use the same setup as the test #ii, but with no user-generated traffic. Rather than prescribe a data rate of 0 kilobytes per second as in SNE Version 1.0, we recommend requiring that no traffic be generated from the LAN-side test client(s). The SNE product under test would be allowed to generate whatever traffic necessary to maintain its connections, better representing real-world situations.

Comparison of the tests #ii and #iii would allow EPA and others to assess the ability of SNE products to scale power to data rate under approximate real-world conditions. Power measurements from the tests #ii and #iii, with an assumed duty cycle, could be used to approximate real-world energy usage.

4. The CA IOUs encourage EPA and DOE to simplify wireless test setup requirements.

EPA and DOE propose to align with the EU CoC wireless test setup instructions and eliminate the signal shielding box required in the SNE Version 1.0 test method. The CA IOUs agree with this approach and do not foresee any significant problems from interference.

5. The CA IOUs encourage EPA to add Institute of Electrical and Electronics Engineers (IEEE) 802.11ax to the list of covered wireless protocols.

IEEE 802.11ax, commonly referred to as Wi-Fi 6 and Wi-Fi 6E, is available in products on the market now and therefore should be covered by the SNE Version 2.0.

6. The CA IOUs believe EPA and DOE should include setup and measurement instructions for multi-component products like Wi-Fi mesh systems in the revised test method.

The CA IOUs highlight Wi-Fi mesh systems as a unique product type that need specific test setup and measurement instructions. These systems commonly include multiple mains-powered components that ship together as one product.⁹ We recommend that these systems be tested with all components setup and integrated into the mesh. Each mains-powered component should be attached to a discrete channel on a multi-channel power meter, and product power should be the sum of the power of the components.

⁹ A few examples of the many such products available include the Netgear Orbi Wi-Fi mesh system, which is available in a variety of configurations (https://www.netgear.com/home/wifi/mesh/rbk853?cid=us-best-wifi6-srch-cpc&utm_source=search&utm_medium=cpc&utm_campaign=us-best-wifi6-srch-cpc), ASUS Lyra (<https://www.asus.com/us/Networking/Mesh-WiFi-System-Home/#sec4>), and Google Nest Wifi (https://store.google.com/us/product/nest_wifi).

In conclusion, the CA IOUs reiterate our support for EPA's efforts to update SNE Version 2.0. We thank EPA for the opportunity to be involved in this process.

Sincerely,



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