July 14, 2020

Tanja Crk
U.S. Environmental Protection Agency
Office of Air and Radiation
Climate Protection Partnership Division
1200 Pennsylvania Avenue, N.W.
Washington, DC 20460

Topic: ENERGY STAR® Water Coolers Draft 1 Version 3 Product Specification

Dear Ms. Crk:

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) Draft 1 Version 3 ENERGY STAR® Water Coolers Product Specification.

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 appreciate the opportunity to provide comments on the Water Coolers Draft 1 Specification. We are supportive of the proposed scope and test method in the draft, especially the potential long-term inclusion of testing water cooler products with draws. While we are supportive of the methodology used to develop Draft 1 levels, we suggest EPA group products by manufacturer and performance. The Draft 1 dataset under this new methodology demonstrates that more challenging requirements can be set for Type 3 (Hot and Cold Storage) water coolers, which are the most prevalent type of ENERGY STAR water cooler. In support of these items, we submit the following comments:

1. **The CA IOUs recommend a minor methodology adjustment for setting Draft 1 requirements, and more challenging requirements for Type 3 storage water coolers.**

   Water cooler products have historically obtained high ENERGY STAR market penetration. In 2013 water coolers had reached 86 percent market penetration of Version 1 products across 31 product manufacturers.[1] In 2018 water coolers had reached an EPA-estimated 62 percent market penetration of Version 2 across 22 product manufacturers.[2] We note that the ENERGY STAR dataset for Draft 1 sets requirements for Type 3 (hot and cold, storage) products that have a 32 percent pass rate, which

[1] ENERGY STAR 2013 Unit Shipment Data Summary Report, page 7.
[2] ENERGY STAR 2018 Unit Shipment Data Summary Report, page 3.

may be too high for such an active product. As mentioned on the EPA stakeholder call on June 24, 2020, and confirmed by the ENERGY STAR Draft 1 dataset,[3] (88 percent of models) of ENERGY STAR certified water cooler products. Based on the importance of this product class, we recommend a requirement level that reaches the guiding principles pass rate of the top 25 percent of existing ENERGY STAR prior version (i.e., Version 2) products.

Calculations on the ENERGY STAR Draft 1 dataset indicate that an efficiency requirement level of 0.68 kilowatt-hour (kWh)/day would result in the passing of 39 of 220 ENERGY STAR products, a pass rate of 17 percent. This pass rate plateaus around 0.68 kWh/day, where 0.66 kWh/day still retains 92 percent of those 39 products, indicating sufficient product design and testing tolerance is available at this efficiency requirement level. Closer inspection of the ENERGY STAR dataset indicates that the substantial difference in pass rates between the proposed requirement levels are due to 21 bottom-load models from two manufacturers which have nearly identical product performance. At the proposed 0.68 kWh/day limit, a model from four unique manufacturers would meet the requirement level for bottom-load products. A plot demonstrating the distribution of bottom-load products is shown in Figure 1. Note that the top load category has significant diversity of manufacturers exceeding the requirement levels, see Figure 2 in Appendix A for more details. Note also that ***all*** conversion type models are eliminated at both the proposed requirement level and the ENERGY STAR Draft 1 requirement level.

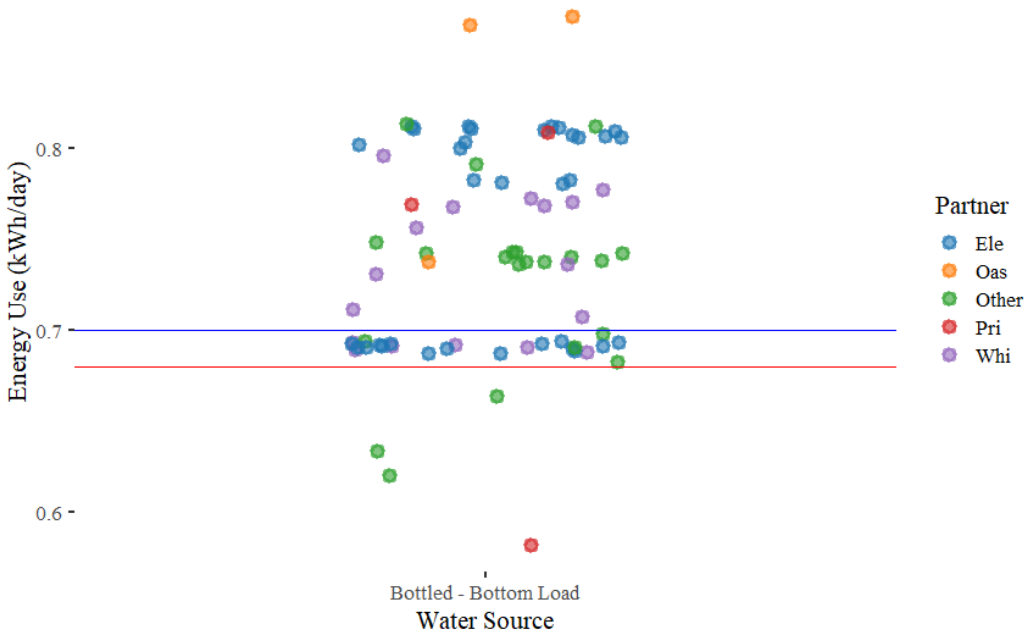

Figure 1: Energy use distribution of bottom-load water cooler products.
Source: U.S. EPA.
Note: Sudden drop-off in pass rates between proposed level and current ENERGY STAR Draft 1 level appear to be caused by an abundance of similar models from Ele. and Whi. in this range. If these products with similar performance were grouped together, these 21 products are effectively two unique models. "Other" manufacturers have two or less Type 3 bottom-load products certified. All four passing bottom-load products are from different manufacturers.

We recommend that EPA recalculate pass rates for products after grouping models from each manufacturer into a single item if the product attributes are similar and performance is identical within two significant figures. We recommend that this result will further corroborate the feasibility

[3] ENERGY STAR Water Coolers Draft 1 Version 3.0 Data Package, tab 3.

of setting a more challenging requirement for Type 3 products. Because the Version 2 water cooler specification has been in effect since early 2014,[4] we believe that this more ambitious level will better encourage product development leading into future water cooler performance.

As the specification is technology and refrigerant neutral, we note that potential pathways exist to obtain additional energy savings in these products, including the use of alternative refrigerants (e.g., R290 (propane), R600a (iso-butane), R1234yf),[5, 6] and night setback functionality.

2. The CA IOUs support additional scope expansion for water cooler products.

We agree with EPA's assessment that products equipped with additional dispensing capabilities, such as sparkling, alkaline, and/or flavored water, would also be eligible for this ENERGY STAR specification, based on the merit of the unit's tested energy consumption. All of this dispensing functionality will be enabled during the test method, which evaluates the product in a standby state;[7] increases in energy consumption based on highly energy consumptive approaches to this functionality would be reflected in the product rating. We note that this additional functionality would be expected to operate primarily during a draw, so it would be expected to have no impact on standby power consumption, limiting consumer energy impact.

Another emerging set of product functionality entering the water cooler space is cloud connectivity, as seen on the Elkay Smartwell and Bevi Quench smart water dispensers.[8] We recommend this functionality be addressed similarly to other ENERGY STAR specifications, where a moderate limit, such as one watt, is provided during the emerging technology period to balance the energy efficient implementation of this functionality with the potential for product innovation. Connectivity features provide potential additional consumer benefits, such as automatic and user-defined scheduling, and potential load flexibility operations.

3. The CA IOUs support additional test procedure measurement points for water cooler product energy consumption estimates.

We are supportive of the inclusion of product performance with water draws in the ENERGY STAR Qualified Products List (QPL) for certified water cooler products. The current test procedure, which evaluates products at standby operation without water draws,[9] is a rating system that allows consistent comparisons between products but may not reflect user energy consumption with the product in the field. The end use of the water cooler product is to provide the user with heated and cooled water, so these draws are an important consideration of product operation. Modifying this test procedure to include water draws, analogous to the federal measurement of water heaters,[10] is a welcome step in bringing ENERGY STAR product data closer to the expected field performance of the product.

When considering product draws, we recommend that both commercial and residential duty cycles be accounted for. Estimates by a bottled water supplier suggest a high-water cooler use starting point for a daily draw pattern would be 0.66 gallons/day for a family of four residential customers, and 3.3

[4] ENERGY STAR Water Coolers Version 2 Final Cover Memo, 2013; page 1.
[5] SECOP, Practical Application of Refrigerants R600a and R290 in Small Hermetic Systems, 2019. Section 4.2, Figure 8.
[6] Linde Guide to Updated EU F-Gas (517/2014) Regulation, 2014. Table 3, applications 10, 14.
[7] ENERGY STAR Water Cooler Test Method, May 2013. Section 6.1, On Mode with No Water Draw.
[8] https://www.elkay.com/us/en/drinking-water/collections/smartwell.html . See FAQ – Operation and Maintenance, product is equipped with both Wi-Fi and Ethernet. Bevi smart water dispenser.
[9] See footnote 7, Section 6.1.
[10] 10 CFR Appendix E to Subpart B of Part 430, Uniform Test Method for Measuring the Energy Consumption of Water Heaters.

gallons/day for a ten-person office.[11] Results from these draw patterns could then be combined in a weighted average to obtain a field energy consumption estimate, matching the commercial/residential water cooler split. This data could also be provided unweighted in the QPL, to assist high volume end users in predicting the energy performance of the unit at their location. Note that these high-volume users would experience both higher annual energy consumption and faster payback on product first costs.

We also recommend EPA evaluate the potential field benefits of *Hot, Cook, and Cold* units,[12] as these units allow consumers to dispense room temperature water when desired. Without this option, the consumer would otherwise dispense either hot or cold water with associated energy consumption, or worst case, add hot water into cold to achieve the desired temperature. To capture this benefit in the draw test, one draw during the *On-Mode Test with Draws* would be a user request for room temperature water, which would fall back to cold-water draw if not available on the tested unit.

4. The CA IOUs support the collection of data on alternative refrigerants.

We strongly support activity that leads to the promotion and adoption of alternative refrigerants, including hydrocarbon (HC) refrigerants, such as R290 and R600a, and hydrofluoroolefin (HFO) refrigerants, such as R1234yf. In addition to the energy performance benefits of these refrigerants as listed in Section 1 of this letter, these refrigerants have lower global warming potential (GWP) compared to conventional hydrofluorocarbon refrigerants.

CA IOU Statewide Codes and Standards Enhancement (CASE) Team literature review indicates that consumer white goods are expected to release between 77 percent to 100 percent of the product refrigerant at end of life.[13] Given that standard white goods refrigerants used in water coolers, such as R134a,[14] has a global warming potential (GWP) of 1430,[15] and these alternative HC/HFO refrigerants have a typical GWP between 1.0 and 4.0,[16] this presents at minimum a 1000x benefit to GWP refrigerant emissions. The typical refrigerant charge of a water cooler unit is 28-35 grams.[17, 18] Carbon Dioxide Equivalent (CO_2e) of these systems is approximately 50 kg CO_2e, which is approximately the CO_2e of 70 kWh of power usage.[19] As product yearly energy savings opportunities decrease with product development, the CO_2e of the refrigeration system will increase in the share of the total carbon impact of the product.

Based on this analysis, we encourage EPA to incorporate refrigerant release impacts as an aspect of the product analysis for refrigerant containing white goods, including water cooler products.

[11] Based on 30.4 days per month, residential family of 4: 4x 5 gal bottles/month, 10-person office: 10 people x 2x 5 gallon bottles /person-month. Source: https://norwaysprings.com/water-cooler-home-office/
[12] See Brio Tri Temp Water Coolers for product examples.
[13] CARB, Emission Inventory Methodology and Technical Support Document, 2015, table 2. End of life refrigerant release range is estimated between 77 percent for a 'Residential Appliance (refrigerator-freezer)', and 100 percent for a 'Residential A/C (window-unit). Note that the lower release for residential refrigerators is attributed to recycling programs specific to this product, thus higher end of life release rates are anticipated.
[14] Primo Water Cooler Model Number 900161, User Manual. Refrigerant is R134a, page 4.
[15] Linde Industrial Gases, Information Sheet, R134a, table 'Environmental Impact'.
[16] Linde Industrial Gases, R290: GWP: 3; R1234yf: GWP: 4; R600a: GWP: 3.
[17] Clover Product Specifications, BL25 line. , table Tech Info. Refrigerant charge of R134a is 34g.
[18] Pittsburgh Water Cooler EBA1K, 115 VAC Models, page 1, refrigerant charge of R12 is 1 oz (28.3 g).
[19] Based on 0.71 kg CO2e / kWh, 35 g charge of R134a. Electric CO2e rate from: EPA greenhouse gas calculator, 2019, Emission Factor.

In conclusion, we would like to reiterate our support to EPA's Draft 1 on Version 3 Water Coolers Product Specifications. We thank EPA for the opportunity to be involved in this process.

Sincerely,

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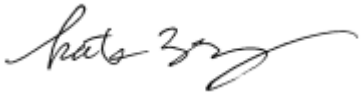

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Appendix A

Figure 2 shows that top-load products have good manufacturer diversity below the proposed limit, including a significant group near 0.5 kWh/day. Lines are: Blue – Proposed Energy Star Limit (0.70), Red – Proposed CA IOU Limit (0.68), both values in kWh/day.

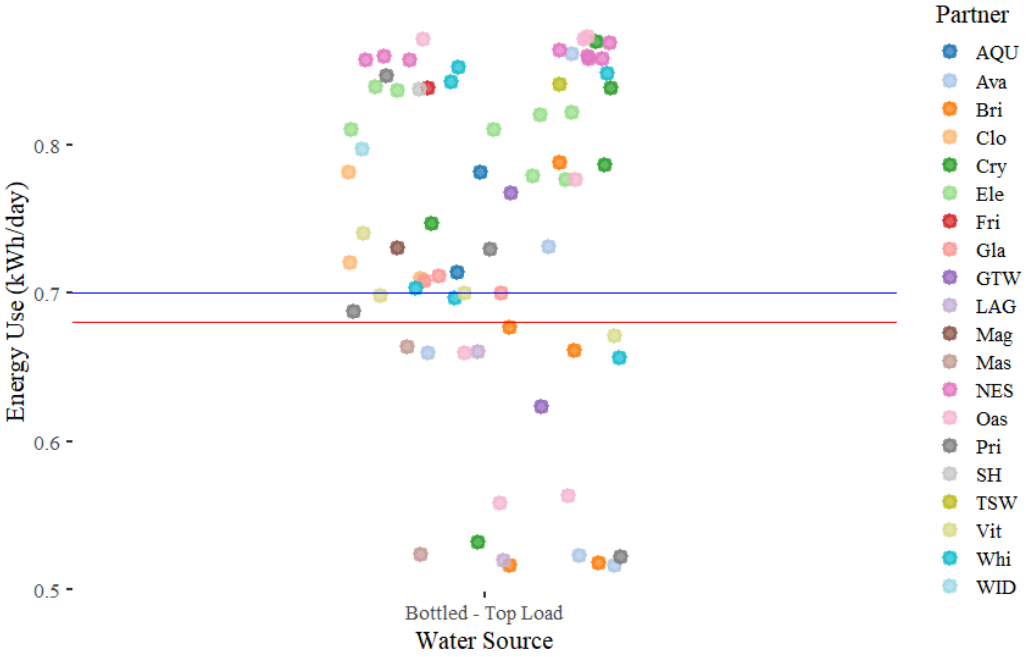

Figure 2: Product diversity in Type 3, top load category.
Source: CA IOUs.