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July 10, 2013

Amanda Stevens  
U.S. Environmental Protection Agency  
Ariel Rios Building  
1200 Pennsylvania Avenue, N.W.  
Washington, DC 20460

RE: ENERGY STAR® Clothes Washer Draft 2 Version 7.0 Specification

Dear Ms. Stevens:

This letter comprises the comments of the Pacific Gas and Electric Company (PG&E), Southern California Gas Company (SCGC), San Diego Gas and Electric (SDG&E), and Southern California Edison (SCE) in response to the US Environmental Protection Agency (EPA) Clothes Washer Draft 2 Version 7.0 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 United States, serving over 35 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 the 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 this opportunity to provide the following comments on the Draft 2 Version 7.0 clothes washer specification. The CA IOUs commend EPA's commitment to maintaining the ENERGY STAR clothes washer specification so ENERGY STAR remains relevant indicator of high-efficiency products. We urge EPA to consider the following comments.

**1. CA IOUs commend the EPA for revising the specification.**

With over sixty percent of washers meeting the Version 6.0 specification within the first year, the ENERGY STAR designation does not accurately identifying the best-performing products. Clothes washer technology is evolving quickly, and it is important the efficiency levels EPA includes in the Version 7.0 specification are stringent enough that the ENERGY STAR label will correctly distinguish the best-performing, top 25 percent of the most-efficient models as of the March 2015 effective date. The CA IOUs support the proposed energy and water efficiency levels outlined in the Draft 2 specification. We encourage EPA to continue engaging manufacturers to identify forthcoming technology improvements and likely market trends to help anticipate how efficiency will change in coming years. If there is a strong indication that efficiency will continue to improve at a rapid rate, EPA might consider including more stringent standards in the Version 7.0 specification.

## 2. Separate top-loading and front-loading product categories are not warranted for residential washers as both designs can achieve similar energy and water efficiency performance.

Separate product categories for top-loading and front-loading residential washers are not warranted for the following reasons:<sup>1</sup>

- ***Top loaders and front loaders do not have distinguishable features:*** The CA IOUs provided comments on the features of top loaders and front loaders in a previous public comment letter to DOE.<sup>2</sup> This letters is available upon request.
- ***Residential top loaders and front loaders achieve similar energy and water performance:*** Data indicates that residential top loaders and front loaders can achieve comparable energy and water efficiency performance. There are many top-loading residential washers that achieve comparable energy and water savings relative to their front-loading counterparts. Since the two designs achieve similar performance, there is no technological reason to create separate product categories for residential washers.
- ***Cycle time should not be used to justify separate product category:*** In this draft of the clothes washer spec, EPA stated the top loaders and front loaders were placed in unique product categories because front-loaders inherently have longer cycle times. We disagree with EPA's decision. We believe cycle time should not be used as a distinguishing feature to create product categories. A preliminary survey of washers available on the market today indicates that there may not be significant differences in cycle times for front-loading and top-loading machines. The shortest pre-set cycle times for Consumer Reports' highest rated front-loading and top-loading machines are 45 and 60 minutes, respectively; top loaders typically have longer cycle times.<sup>3</sup> While there is a larger variation in cycle time for front loaders, the highest performing front loaders have a shorter cycle time than the highest performing top loaders. Another factor we suggest EPA consider is that the remaining moisture content of laundry has an impact on dryer cycle times. In general, front loaders are more effective at removing moisture from clothing, which could lead to shorter dryer cycle times.

## 3. CA IOUs support EPA's decision to add a product category for small washers.

Small washers are more practical in certain situations when there are space constraints or when the wash demand is low (e.g., spaces with a single occupant). The IOU team assessed the efficiency of small washers available in the American and European markets. The most efficient small washers can achieve similar IMEF (integrated modified energy factor) and IWF (integrated water factor) performance as larger washers; however there are not many products that meet this performance requirement. The CA IOUs agree with EPA that creating a separate product category for small washers, thereby making it feasible for approximately 10-20 percent of the small washers available in the United States to receive the ENERGY STAR designation. It will help consumers who are looking for small washers quickly identify the most efficient products in the small washer category. For these reasons, the IOUs support EPA's decision to create a separate product category for small washers.

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<sup>1</sup> We do not have enough information at this time on commercial equipment to comment on product categorization for commercial washing machines.

<sup>2</sup> CA IOU Comments on DOE Framework Document for Residential Clothes Washers: Docket No. EERE- 2008-BT-STD-0019 and/or RIN 1904- AB90, 1000. October 2, 2009.

<sup>3</sup> <http://www.consumerreports.org/cro/appliances/laundry-and-cleaning/washing-machines/washing-machine-recommendations/top-loading-washing-machine.htm>; <http://www.consumerreports.org/cro/appliances/laundry-and-cleaning/washing-machines/washing-machine-recommendations/front-loading-washing-machine.htm>.

**4. ENERGY STAR’s revised product categories could lead to more complicated utility incentive programs that would be more expensive to administer.**

Every year the CA IOUs provide rebates for over 100,000 residential clothes washers. In general, adding additional product categories creates more consumer choice and can give utilities more flexibility in how to achieve cost-effective energy savings. However, adding product categories increases the complexity of programs, increasing administrative efforts and administrative costs. The IOUs will need to conduct further research to weigh the advantages and disadvantages of adopting ENERGY STAR’s proposed product categories.

**5. Including operational status requirements in the connected criteria will help inform the CA IOU’s demand response practices.**

We support including operational status requirements in the connected criteria (Section 4.F.1). The CA IOUs envision a requirement that all demand response (DR) capable appliances report operational status as a condition of participating in DR rebate programs. We have conducted preliminary tests to determine how clothes washers behave during DR events. Collecting more information about washer operational status will allow us to understand the overall impacts of how appliances behave in DR events, and will inform DR practices. With this data, the IOUs will be in a better position to provide meaningful feedback to manufacturers on how washer DR capabilities integrate with utility DR practices.

**6. CA IOUs agree that incorporating a cleaning and rinsing test will give consumers confidence that efficiency gains are not achieved at the expense of a washer’s ability to wash clothes effectively.**

Efficiency gains cannot come at the expense of product functionality. Incorporating functionality tests into the ENERGY STAR like the proposed cleaning and rinsing test prevents products from slipping backwards on performance metrics. The IOUs fully support including tests to assure ENERGY STAR products meet performance expectations.

**7. The rolling 24-hour limitation is unnecessary for clothes washers.**

The connected criteria requires the clothes washer to provide at least one Delay Appliance Load and Temporary Appliance Load Reduction response “in a rolling 24-hour period.” Manufacturers may implement this as an absolute limitation of one event per 24 hour period. Limiting of DR response events may be required for maintaining satisfactory operation of continuous appliances (i.e. refrigerators), but is unnecessary for cycle-based appliances (i.e. clothes washers and dishwashers). In cycle-based appliances, each cycle is an independent event and is not affected (or very minimally affected) by previous operation cycles. Thus, any restriction of DR event response based on time is not appropriate. Sections 4.G.1.c. and 4.G.2.c. should be removed.

Reiterating a point raised in SCE’s comments to ENERGY STAR regarding the Program Requirements Product Specification for Refrigerators and Freezers specification development process,<sup>4,5,6</sup> the ability to

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<sup>4</sup> Southern California Edison’s Comments on the ENERGY STAR Draft 2 Version 5.0 Specification for Residential Refrigerators and Freezers, and the ENERGY STAR Program Draft Test Method to Validate Demand Response (DR) for Residential Refrigerators and Freezers. March 23, 2012. Available online:

[https://www.energystar.gov/products/specs/sites/products/files/SCE\\_Comments\\_Energy\\_Star\\_Refrigerator\\_Freezer\\_DR\\_Criteria\\_and\\_Test\\_Method.pdf](https://www.energystar.gov/products/specs/sites/products/files/SCE_Comments_Energy_Star_Refrigerator_Freezer_DR_Criteria_and_Test_Method.pdf)

<sup>5</sup> Southern California Edison’s Comments on the ENERGY STAR Program Requirements Product Specification for Residential Refrigerators and Freezer Draft 2 Test Method to Validate Demand Response Rev. Nov-2012. January 4, 2012. Available online:

<https://www.energystar.gov/products/specs/sites/products/files/Southern%20California%20Edison%20Comments.pdf>.

<sup>6</sup> Southern California Edison’s Comments on the ENERGY STAR Program Requirements Product Specification for Residential Refrigerators and Freezer Eligibility Criteria Final Draft Version 5.0. April 12, 2013. Available online:

<https://www.energystar.gov/products/specs/sites/products/files/SCE%20Comments%20-%20Energy%20Star%20Ref%20Frzr%20Final%20Draft%20V5%2000.pdf>.

respond to events should be based on the appliance's ability to "know" whether it is capable of responding without degrading its performance. There should be no overriding time factor.

**8. The test method "signal" must be precisely defined to ensure that laboratory test results will be repeated in response to triggers by utility DR programs.**

The DOE test method in development to validate DR capabilities of clothes washers must clearly define the signal that should be sent to the appliance during testing. In recent testing of DR capable appliances conducted at SCE, it was discovered that the various manufacturers trigger their appliance responses based on different components of the DR signal. One responds only based on the duration part of signal, while another looks only to the criticality (or price) level part of the signal.

The test method must define exactly what signal is sent to test out functionality for both Temporary Appliance Load Reduction and Delay Appliance Load scenarios, using a known protocol such as Smart Energy Profile 2.0 (SEP 2.0). If this change does not happen and existing response schemes are further deployed, a signal broadcast to appliances in a utility's service territory would have to include ALL of the tags (unique bits of information contained in the signal) required to activate ALL manufacturers DR signals. Administrative costs of managing such a program would be greatly increased over a method with standardized signals.

**9. Cleaning and rinse test method should yield realistic results.**

The CA IOUs agree with the general approach of using the Association of Home Appliance Manufacturers (AHAM) test method as a starting point for the clean/rinse test method and harmonizing it with the existing Department of Energy (DOE) energy and water efficiency test procedure.<sup>7,8</sup> While the overall approach is agreeable, DOE and EPA should be thoughtful about how to achieve harmonization. When combining sections of AHAM test procedure and the DOE test procedure to create a new procedure, DOE should take care to ensure that the resulting test procedure measures washer performance at least as well as existing AHAM procedure while measuring energy and water performance at least as well as the existing DOE procedure. We urge DOE and EPA to consider the following comments when developing the harmonized test procedure:

- **Intuitive Performance Metric:** We agree that the performance metric should be comprehensible and intuitive for consumers, and that higher scores on both clean and rinse tests should represent better performance.
- **Representative Test Load:** The CA IOUs are pleased that DOE recognizes that it is desirable to measure cleaning and rinsing performance under conditions that are similar to those required by the DOE energy efficiency test. We believe that neither test load under consideration (Option 1 – AHAM, or Option B – DOE) is truly representative of actual clothing loads. The AHAM and DOE test loads are each composed of flat sheets of cotton or polyester fabric that could represent napkins, handkerchiefs, sheets, towels, or the like. These sample materials are not representative of garments. Instead of using the AHAM or DOE Test Load, DOE might consider defining a new test load that incorporates a representative fabric selection and garment design. The fabric selection should include the fabric type (e.g., cotton, polyester, etc.) as well as variation in thread counts if warranted (e.g., thread count for jeans and dress shirts varies significantly).
- **Folding/Loading Sequence:** IOU test results indicate that the manner in which a washer is loaded impacts the energy performance. Top loaders with an unbalanced load will not perform as

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<sup>7</sup> Association of Home Appliance Manufacturers (AHAM) test method HLW-1-20 2010, "Performance Evaluation Procedures for Household Clothes Washers"

<sup>8</sup> DOE test procedure at 10 CFR 430, Subpart B, Appendix J2, "Uniform Test Method for Measuring the Energy Consumption of Automatic and Semi-Automatic Clothes Washers," as published at 77 FR 13888, 13939, March 7, 2012.

well in energy metrics as the same washer tested with a balanced load. While the IOUs have not conducted clean/rinse testing on unbalanced loads, we hypothesize that an unbalanced load will not perform as well in clean/rinse metrics either. Because loading can impact both energy and clean/rinse performance, it is important that the test procedure include explicit loading protocols.

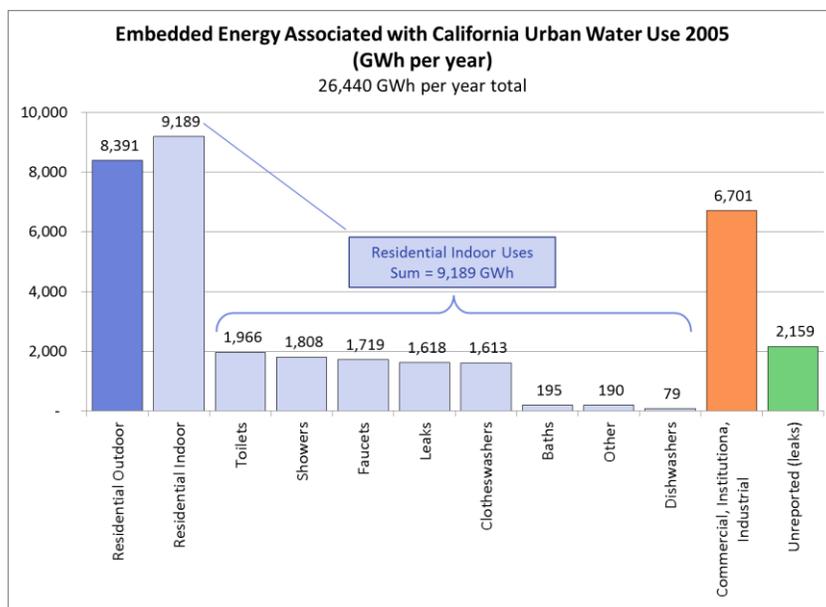
- **Repetition and Minimizing Test Burden:** We are supportive of efforts to simplify the overall test burden as long as the resulting test method yields results that are statistically significant, are representative of actual washer use, and provide the necessary information for users to accurately assess washer performance. DOE's proposal to perform the clean/rinse tests at the most common temperature settings appears to be a reasonable method to reduce test burden.
- **Selection of Test Cycles:** DOE should consider developing the test method so it establishes the top and bottom bounds of likely clean/rinse performance. The test performed at the cold/cold setting will likely result in the poorest clean/rinse performance whereas the test performed at the hot/hot setting will result in better clean/rinse performance. Information about how washers perform at cold/cold versus hot/hot will allow consumers to gain insight as to how water temperature selection impacts the washer's ability to clean clothes, and could potentially lead to additional energy savings attributed to users selecting a wash cycle that uses lower water temperatures.
- **Scoring:** DOE has proposed to report the clean score and the rinse score for each temperature setting. The IOUs agree that providing results at each temperature setting is useful information. However, DOE might also consider developing a weighted score that represents the average performance that will be achieved given typical washer use patterns across the state.

**10. The CA IOUs encourage EPA to lay the foundation for future specifications to address combined energy and water performance of washers and dryers as an integrated system as opposed to two unique and products with no interaction**

Typically, clothes washers and clothes dryers are used sequentially to achieve the goal of washing and drying laundry. EPA should identify ways to categorize the energy performance of the washer-dryer system as a whole, in addition to independent performance currently included. These two products interact with one another, and future ENERGY STAR standards should take these interacting effects into account. For example, a washer-dryer system uses less energy if the washer is able to remove as much water as possible thereby reducing demand on the dryer. To achieve this system-level efficiency, washer energy use may increase to achieve better spin performance while dryer energy use will be reduced.

**11. EPA should consider publishing estimated energy savings embedded in water savings.**

The amount of energy needed to deliver and heat potable water and to treating wastewater is significant. The California Energy Commission estimates that as much as 20 percent of California's total energy use is attributed to delivering potable water and treating wastewater. Figure 1 presents the estimated embedded energy in urban water use in California. In 2005, approximately 1.6 TWh of electricity was used to deliver and treat water used in California's residential clothes washers. This does not include energy used to heat water.



**Figure 1: Embedded Energy in California Urban Water Uses (2005)**

Sources: California Energy Commission. Refining Estimates of Water-related Energy Use in California (CEC-500-2006-118).

Prepared by Navigant Consulting, Inc., Public Interest Energy Research Program (December 2006). CEC-500-2006-118. <http://www.energy.ca.gov/2006publications/CEC-500-2006-118/CEC-500-2006-118.PDF>.

Christian-Smith, Juliet; Heberger, Matthew; and Luch Allen. Urban Water Demand in California to 2100: Incorporating Climate Change. 2012. Pacific Institute.

[http://www.pacinst.org/reports/urban\\_water\\_demand\\_2100/full\\_report.pdf](http://www.pacinst.org/reports/urban_water_demand_2100/full_report.pdf).

Assumptions: Embedded energy factor of 8,134 kWh/MG for residential outdoor water use and unreported (leaks); embedded energy factor of 10,045 kWh/MG for residential indoor; embedded energy factor of 9,090 kWh/MG for commercial, institutional, industrial.

We understand that the amount of electricity embedded in California’s water is significantly higher than national average embedded energy values. However, the point remains that there are significant energy savings associated with water savings. As an illustration, assuming a conservative nation-wide embedded energy factor of 1,250 kWh per million-gallons, the 6,022 million gallons of water EPA estimates will be saved on an annual basis due to the revised ENERGY STAR specification is associated with an embedded electricity savings of 7.5 GWh, which is equivalent to the annual electricity use from about 665 homes.<sup>9,10</sup>

EPA should attempt to address the embedded energy impacts of ENERGY STAR requirements that result in water savings. This is particularly important as the availability of potable water in the future looms as a major issue in California and many other regions of the country. We understand that developing estimates of embedded energy savings is challenging because embedded energy varies significantly by region and a comprehensive analysis of nation-wide embedded energy values has not been developed. Despite the challenges, the amount of energy embedded in water is an important issue that should be addressed and estimating embedded energy savings from ENERGY STAR products is one way to raise awareness and begin tackling this larger issue.

<sup>9</sup> Most utilities use between 1,250 kWh/million gallon and 6,500 kWh/million gallon for water supply, conveyance, treatment, distribution, wastewater collection, and wastewater treatment. Source: Carlson, Steven and Adam Walburger. *Energy Index Development for Benchmarking Water and Wastewater Utilities*. 2007. Prepared for American Water Works Association Research Foundation, California Energy Commission and New York State Energy Research and Development Authority.

<sup>10</sup> US Department of Energy. *Greenhouse Gas Equivalencies Calculator: Calculations and Assumptions*. <http://www.epa.gov/cleanenergy/energy-resources/refs.html#houseelec>.

In conclusion, we would like to reiterate our support to EPA for establishing a revised specification for residential clothes washers. We thank DOE for the opportunity to be involved in this process and encourage DOE to carefully consider the recommendations outlined in this letter.

Sincerely,



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