

**CALIFORNIA ENERGY COMMISSION**

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October 26, 2017

Ms. Sharon Frey  
ENERGY STAR Program  
U.S. Environmental Protection Agency  
1200 Pennsylvania Avenue, MC 6202J  
Washington, DC 20460  
***Via email: PoolPumps@energystar.gov***

RE: CALIFORNIA ENERGY COMMISSION'S COMMENTS ON ENERGY STAR  
POOL PUMPS DRAFT SPECIFICATION 2.0 AND 3.0, PROPOSAL

Dear Ms. Frey:

Thank you for the opportunity to comment on the U.S. Environmental Protection Agency's (U.S. EPA) ENERGY STAR® Program Pool Pumps Specification 2.0 and 3.0, Proposal. The California Energy Commission has taken an active interest in the U.S. EPA's efforts to improve and update the ENERGY STAR Pool Pumps Specification 2.0 and 3.0, particularly as the Energy Commission has participated in the recently completed U.S. Department of Energy (DOE) Direct Final Rule for Energy Conservation Standards for Dedicated Purpose Pool Pumps (DPPP). The Energy Commission also has an on-going pre-rulemaking effort to update the California Energy Efficiency Standards for Replacement Pool Pump Motors.

Overall, we are pleased to see the careful thought and effort that the U.S. EPA is devoting to the development of Pool Pumps Specification 2.0 and 3.0. The proposed levels are cost-effective, technologically feasible, and representative of high-performing pool pumps currently available in the market.

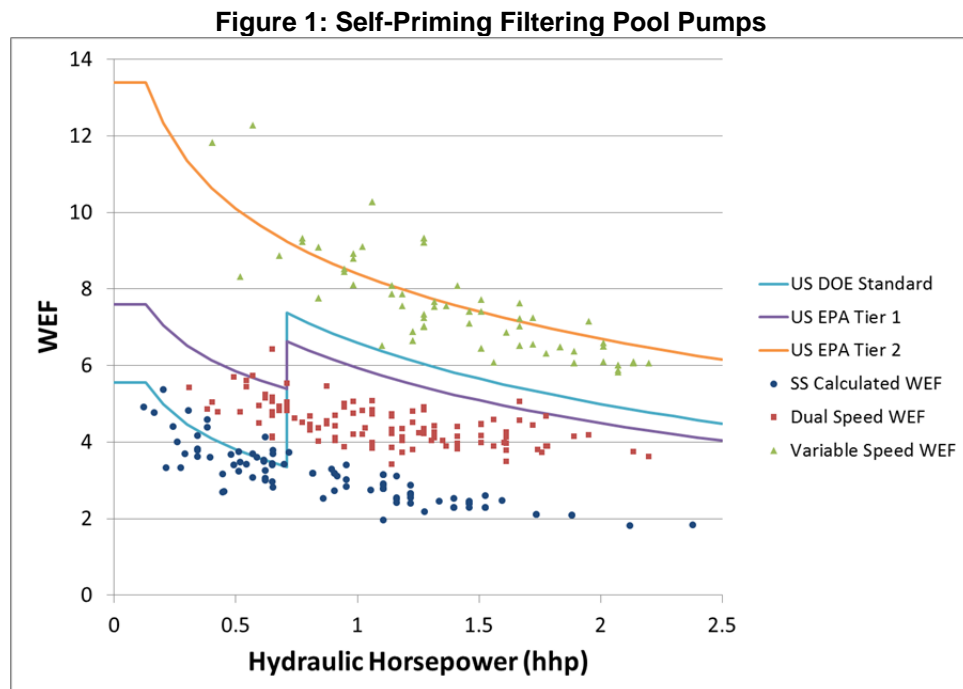
We offer the following comments to provide additional information for the U.S. EPA's consideration and to encourage the U.S. EPA to retain the strong Tier 1 and 2 levels.

**I. The Energy Commission generally supports the proposed Tier 1 and Tier 2 levels for pool pumps.**

The Energy Commission supports the U.S. EPA's proposal to improve efficiency levels for pool pumps, and requests that the U.S. EPA further increase the Tier 1 level for standard size self-priming filter pool pumps to be consistent with the future minimum U.S. DOE standard.<sup>1</sup> Many pool pumps already meet the future U.S. DOE standard, and adopting a level consistent with the standard would assist the market to transition.

With this adjustment, the proposed efficiency levels overall would provide the ENERGY STAR label only to the most energy efficient pool pumps, regardless of technology. The ENERGY STAR label will help consumers to identify pool pumps that will save the most energy (and money), and will help utility programs to design rebates and incentives around pool pumps that yield the most energy benefits. These efforts will help increase the market share of efficient pool pumps ahead of the federal DPPP standards and drive down the capital cost of the most efficient pool pumps as manufacturers are able to achieve economies of scale.

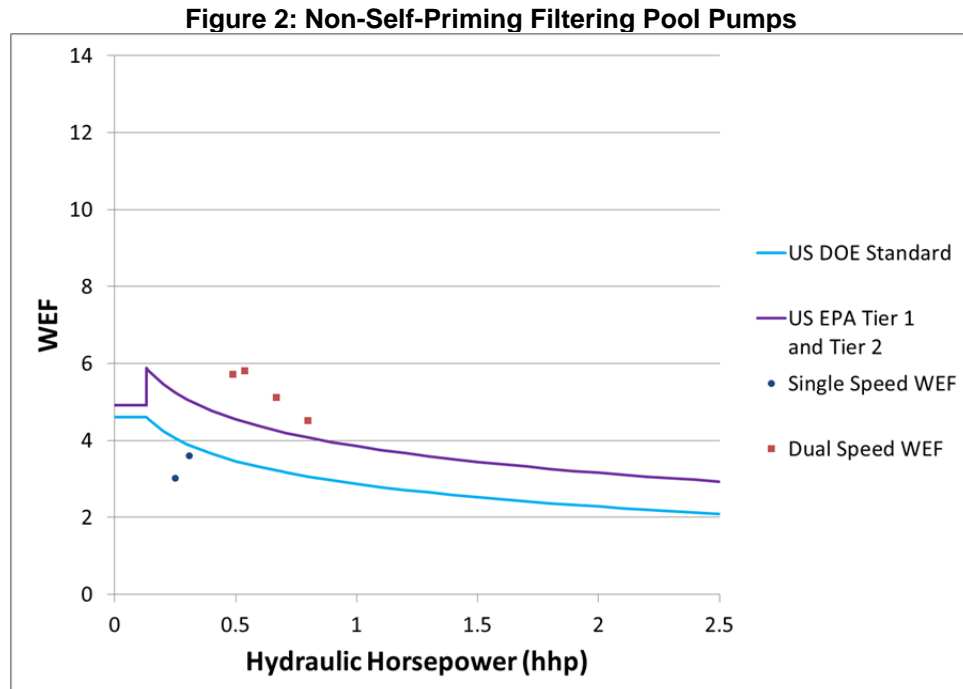
Energy Commission staff plotted the proposed U.S. EPA specification levels vs. weighted energy factor (WEF) scores calculated by the U.S. DOE.<sup>2</sup> Figures 1 and 2 demonstrate both Tier 1 and 2 levels are achievable by currently available pumps.



Source: Energy Commission staff illustration with U.S. DOE WEF performance data

<sup>1</sup> Self-priming filtering pool pumps with a hydraulic output of .711 to 2.5 hydraulic horsepower.

<sup>2</sup> Self-Priming Pool Filter Pump Performance Database v1.0 - June 17, 2016, available at <https://www.regulations.gov/document?D=EERE-2015-BT-STD-0008-0083>.



Source: Energy Commission illustration with U.S. DOE WEF data per DPPP Technical Support Document Figure 5.6.3

The U.S. EPA levels for pressure cleaner booster pumps anticipate industry innovations incorporating variable speed motors and multi-stage pump heads.<sup>3</sup> These approaches illustrate the possibility of efficient product differentiation in this class.

## II. The Energy Commission supports the efforts to develop a specification for replacement pool pump motors

Many consumers choose to replace the pool pump motor when it fails rather than the entire pump and motor combination. Most replacement pool pump motors are not covered by existing U.S. DOE standards for motors, and consumers do not currently have enough information to easily choose a motor that will match the efficiency of their pump. The Energy Commission is currently investigating test procedures and standards for replacement pool pump motors, and encourages the U.S. EPA to do the same. Proposing a test procedure and standard specifically for replacement pool pump motors offers a significant energy saving opportunity in California and nationwide.<sup>4</sup>

<sup>3</sup> See, e.g., Pentair Boost-Rite Booster Pump, available at <https://www.pentairpool.com/en/products/pumps/boost-rite%20booster%20pump%20pressure-side%20cleaner%20pump>; Polaris PB4SQ Booster Pump, available at: [https://www.polarispool.com/~/\\_media/zodiac/global/downloads/sl/sl6969.pdf](https://www.polarispool.com/~/_media/zodiac/global/downloads/sl/sl6969.pdf); and Power Defender Booster Pump, Waterway Plastics, available at: <http://waterwayplastics.com/products/pool-products/pumps/booster-pumps-2/power-defender-booster-pump/>.

<sup>4</sup> Steffensen, Sean, Jessica Lopez, and Ben Fischel. 2017. *Second Revised Staff Analysis of Efficiency Standards for Pool Pump Motors, and Spas*. California Energy Commission. Publication Number: CEC-400-2016-002-SD3, pp. 49-50.

### *Test Procedures*

The Energy Commission supports the development of a replacement pool pump motor test procedure that would emulate the approach of the DPPP test procedure by identifying energy savings from efficient motor operation as well as from the pump's ability to operate at multiple speeds.<sup>5</sup> The replacement pool pump motor test procedure should similarly provide a performance metric consistent with the DPPP test procedure. The Energy Commission has proposed a motor test procedure where the test conditions would mimic the conditions a motor would experience within a DPPP.<sup>6</sup> The Energy Commission recommends that the U.S. EPA investigate using CSA 747-2009 (RA2014) as the basis for a test procedure for replacement pool pump motors, and choose motor test points that align with the test points for DPPP.

### *Efficiency Levels*

The Energy Commission staff has proposed efficiency standards for replacement pool pump motors sold or offered for sale in California.<sup>7</sup> The Commission proposes a motor weighted energy factor to measure motor performance at multiple speeds. The proposal aligns with the U.S. DOE DPPP standard by having different minimum efficiency levels for each DPPP type. By aligning the efficiency standards for replacement pool pump motors with those for DPPP, the Commission proposal will extend the DPPP energy savings to the replacement pool pump motor market.

The Energy Commission's proposed efficiency levels for replacement pool pump motors greater than one horsepower (in terms of motor total capacity) can be achieved with variable speed motor technologies. For motors less than one horsepower, the efficiency levels can be met with efficient single-speed motor technologies. Figure 3 illustrates the MWEF calculation and the Commission's proposed standard for replacement pool pump motors.

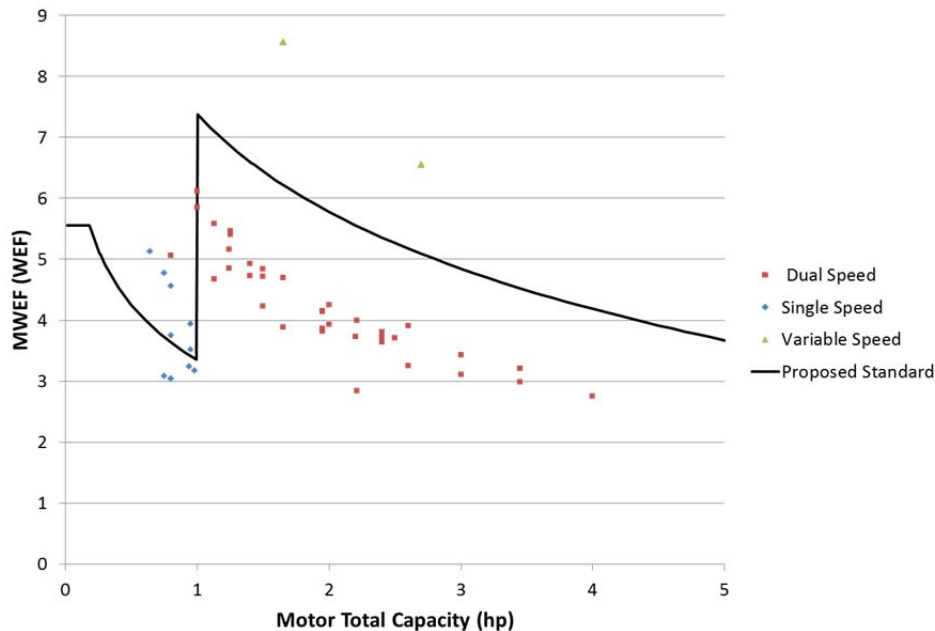
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<sup>5</sup> See Dedicated-Purpose Pool Pump Test Procedure Final Rule, 82 FR 36876-36877 (Aug 7, 2017).

<sup>6</sup> Steffensen et al., *supra* note 5, at pp. 41-45.

<sup>7</sup> Steffensen et al., *supra* note 5, at pp. 34-39.

**Figure 3: MWEF Scores for Replacement Residential Pool Pump Motors**



Source: Energy Commission staff illustration with Appliance Efficiency Database data, April 4, 2017

The U.S. EPA should review the motor technologies certified to the Energy Commission's Modernized Appliance Efficiency Database System, as well as the analysis conducted in the Energy Commission's staff report proposing efficiency levels for DPPP motors.<sup>8</sup> The Association of Pool and Spa Professionals also maintains a database of replacement pool pump motors with additional models.<sup>9</sup> The U.S. EPA could then choose efficiency levels for replacement pool pump motors that align to the proposed pool pump levels.

### III. Additional Energy Efficiency Opportunities

#### *Freeze Protection*

The U.S. DOE adopted a prescriptive requirement for freeze protection settings for those pool pumps with freeze protection capability. The requirement will ensure that either freeze protection is disabled when shipped or if enabled that the pump's speed, temperature set point, and run time are set appropriately so as to not use an unnecessary amount of energy. The requirement is a result of a unanimous agreement between industry and advocates and presents an additional opportunity for the ENERGY STAR Label to differentiate pool pumps that will save consumers money and

<sup>8</sup> *Id.* at pp. 35, 53-56; see also Commission Staff Motor Weighted Energy Factor Calculation Spreadsheet, available at: <https://efiling.energy.ca.gov/Lists/DocketLog.aspx?docketnumber=15-AAER-02>.

<sup>9</sup> Association of Pool and Spa Professionals Replacement Pool Pump Motor Database available at: <https://www.apsp.org/Portals/0/Pool%20Pump%20Database/Pump%20Motors%20-%20Replacement%20-%20April%206%202017.xlsx>.

energy. The Energy Commission encourages the U.S. EPA to include freeze protection requirements in the update to the pool pump specification.

#### *Large Self-Priming-Filtering Pool Pumps*

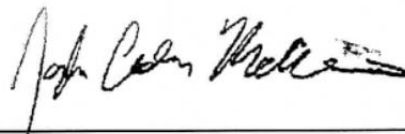
The U.S. DOE set the upper limit of the test procedure and standard for DPPP to 2.5 hydraulic horsepower due to a combination of three reasons; low shipment volume, low potential for energy savings (due to prevalence of motors already regulated by the U.S. DOE), and a lack of performance data.<sup>10</sup> There are over 240,000 commercial pools in the U.S.<sup>11</sup> that employ much larger pool pumps to filter water for filtration. Recent changes to U.S. Centers for Disease Control and Prevention's Model Aquatic Code allow a 25 percent turndown of motor speed when the pool is not occupied.<sup>12</sup> The introduction of variable speed technology and the ability to turndown presents a new opportunity for energy savings. The Energy Commission encourages the U.S. EPA to work with industry on data collection requirements for large self-priming filtering pumps. The data collection goal would be to look for opportunities to develop an ENERGY STAR specification that in turn would lead to the basis for rebate programs.

#### **IV. Conclusion**

The Energy Commission supports the U.S. EPA's efforts to improve the efficiency of pool pumps through the stringent tier 1 and tier 2 levels. The Commission encourages the U.S. EPA to continue this effort to obtain greater energy savings and to ensure that the ENERGY STAR program remains the recognized leader for highly efficient pool pumps in a rapidly evolving market.

If you have any questions about our comments, please contact Sean Steffensen, Mechanical Engineer, at (916) 651-2908, or [Sean.Steffensen@energy.ca.gov](mailto:Sean.Steffensen@energy.ca.gov).

Sincerely,



J. ANDREW McALLISTER, Ph. D.  
Commissioner

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10 U.S. DOE Dedicated Purpose Pool Pumps Working Group Meeting Transcript, April 19, 2016, Docket No. EERE-2015- BT-STD-0008, No. 79 at p. 36-47, available at <https://www.regulations.gov/document?D=EERE-2015-BT-STD-0008-0079>.

11 U.S. Swimming Pool and Hot Tub Market 2015, APSP, available at <http://www.apsp.org/Portals/0/2016%20Website%20Changes/2015%20Industry%20Stats/2015%20Industry%20Stats.pdf>.

12 Centers for Disease Control and Prevention Model Aquatic Code, 1st Edition, August 2014, Section 4.7.1.10.6, p. 130. <http://www.cdc.gov/healthywater/pdf/swimming/pools/mahc/Complete-First-Edition-MAHC-Code.pdf>.