



NATURAL RESOURCES DEFENSE COUNCIL

June 16, 2014

California Energy Commission
Dockets Office, MS-4
Re: Docket No. 14-AAER-1
1516 Ninth Street
Sacramento, CA 95814-5512

California Energy Commission

DOCKETED

14-AAER-01

TN 73213

JUN 16 2014

Via electronic mail to docket@energy.ca.gov

RE: CEC DOCKET NO. 14-AAER-1, APPLIANCE EFFICIENCY PRE-RULEMAKING

The Natural Resources Defense Council (NRDC) appreciates the opportunity to offer comments on the Title 20 Appliance Efficiency Pre-Rulemaking. NRDC is a nonprofit membership organization with a long-standing interest in minimizing the societal and environmental costs of providing the reliable water and energy services that Californians demand. We represent our nearly 80,000 California members' interests in receiving affordable water and energy services and reducing the environmental impact of the state's water and energy consumption. NRDC appreciates the ongoing effort of the California Energy Commission (CEC) staff to address the numerous water and energy issues facing California and applauds the overall focus of the Appliance Efficiency Pre-Rulemaking to help California mitigate the impacts of climate change and drought.

In September 2011, NRDC submitted proposals to the California Energy Commission (CEC) for the consideration of Title 20 Appliance Efficiency Standards for toilets, urinals, faucets, and water meters. Our 2011 proposal included recommendations to align Title 20 appliance efficiency standards with existing law enacted through AB715 for toilets and urinals and require faucets to meet the flow criteria of EPA's WaterSense product standard. Since the submittal of our 2011 proposals, NRDC and the consultants for the California Investor Owned Utilities (CA IOUs) have completed additional research that demonstrates significant additional water and energy savings can be achieved through stricter standards for urinals and lavatory faucets. In July 2013, NRDC and the CA IOUs submitted a CASE report to the CEC in response to the Commission's invitation to submit proposals. The CASE report recommends water efficiency standards for 1.28 gallons per flush (gpf) for toilets, 0.125 gpf for wall-mounted urinals, 0.5 gpf for floor-mounted urinals, a maximum flow rate of 1.0 gallons per minute (gpm) at 60 pounds per square inch (psi) and a minimum flow rate of 0.5 gpm at 20 psi for residential lavatory faucets, and a 1.8 gpm flow rate with optional 2.2 gpm flow rate for residential kitchen faucets. In February 2014, NRDC and the CA IOUs submitted an addendum with information to support a 0.125 gpf standard for urinals.

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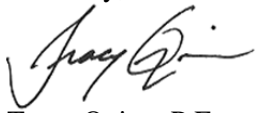
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The table below shows the estimated water and energy savings from the CEC and NRDC proposals and breaks out the additional water and energy savings the state is leaving on the table if the CEC chooses to simply adopt WaterSense standards. The NRDC/IOU proposals for lavatory faucets and urinals will save an *additional* **26 billion gallons** of water, **130 GWh**, and **83 million therms** annually after stock turnover.

		CEC Proposal	NRDC Proposal	Additional Savings from NRDC Proposal
Lavatory Faucet				
Annual Water Savings	Million Gallons	6,080	30,953	24,873
Annual Energy Savings (Hot Water)	GWh	32	162	130
	Million Therms	20	103	83
Urinal				
Annual Water Savings	Million Gallons	0	1,676	1,676

The information and data contained in this letter clearly demonstrate that the proposed standards presented in the NRDC/CA-IOU CASE report, specifically more efficient urinals and lavatory faucets, meet the appliance efficiency standard adoption requirements of cost effectiveness, technical feasibility and product efficacy.

Sincerely,



Tracy Quinn, P.E.

Policy Analyst, Natural Resources Defense Council

Summary of CEC Staff Proposals:

In April 2014, the CEC released the CEC Draft Staff Report, Staff Analysis of Toilets, Urinals and Faucets (Staff Report). Per the Staff Report, the staff's proposed standards for toilets, urinals, and faucets, which will take effect one year after adoption by the Energy Commission, are the following:

- All toilets, except those designed for prisons or mental health facilities, shall not consume more than 1.28 gpf and shall have a MAP score of no fewer than 350 grams.
- All urinals, except trough-type and those designed for prisons or mental health facilities, shall not consume more than 0.5 gpf.
- All home lavatory faucets shall not exceed 1.5 gpm flow rate with pipe pressure at 60 pounds per square inch (psi) and shall have a minimum flow rate of 0.8 gpm at 20 psi.
- All kitchen faucets shall not exceed 1.8 gpm flow rate and may have capability to increase to 2.2 gpm momentarily for filling pots and pans.
- All public lavatory faucets shall not exceed 0.5 gpm flow rate at 60 psi.

Standards for the following appliances will take effect January 1, 2019.

- All replacement valves for toilets shall not exceed 1.6 gpf.
- All replacement valves for urinals shall not exceed 1.0 gpf.

Summary of NRDC's Recommendations:

NRDC supports CEC's staff proposals for toilets, kitchen faucets, public lavatory faucets, replacement valves for toilets, and replacement valves for urinals. However, NRDC encourages the CEC to adopt stricter standards for lavatory faucets and wall-mounted urinals as listed below.

NRDC's proposed standards for toilets, urinals, and faucets, which will take effect one year after adoption by the Energy Commission, are the following:

- All toilets, except those designed for prisons or mental health facilities, shall not consume more than 1.28 gpf and shall have a MaP score of no fewer than 350 grams.
- All wall-mounted urinals, except trough-type and those designed for prisons or mental health facilities, shall not consume more than **0.125 gpf**.
- All floor-mounted urinals, except trough-type and those designed for prisons or mental health facilities, shall not consume more than 0.5 gpf.
- All home lavatory faucets shall not exceed **1.0 gpm** flow rate with pipe pressure at 60 pounds per square inch (psi) and shall have a minimum flow rate of **0.5 gpm** at 20 psi.
- All kitchen faucets shall not exceed 1.8 gpm flow rate and may have capability to increase to 2.2 gpm momentarily.
- All public lavatory faucets shall not exceed 0.5 gpm flow rate at 60 psi.

Standards for the following appliances will take effect January 1, 2019.

- All replacement valves for toilets shall not exceed 1.6 gpf.
- All replacement valves for urinals shall not exceed 1.0 gpf.

LAVATORY FAUCETS

The data provided in the CASE report demonstrates that a 1.0 gpm standard for residential lavatory faucets is cost effective, technically feasible, and would provide comparable efficacy to 1.5 gpm lavatory faucets. The requirements for standard adoption are further supported by the information provided in this letter which specifically addresses concerns noted in the CEC Staff Report which specifically cited two issues, 1) potential customer dissatisfaction with longer wait times for hot water, and 2) “waiting a long time to get hot water delivered may actually cause water waste that would negate savings.” The Staff Report, however, does not include a reference to any studies or resources that confirm either assertion. While NRDC acknowledges that there is some additional waiting time for hot water due to the flow rate difference between 1.5 gpm and 1.0 gpm faucets, studies support NRDC’s assertion that customers are satisfied with 1.0 gpm faucets. Additionally, research and analysis demonstrates there is still significant potential savings from higher efficiency fixtures, even with scenarios that assume no water is saved during hot water draws.

Customer Satisfaction:

There are several studies that support the assertion that consumers are satisfied overall with the performance of 1.0 gpm low-flow faucets.

- The WaterSense (2007) specification indicated that “these products have shown a high level of satisfaction,” and also cites survey results from the Seattle Public Utilities regarding a pilot program that distributed free aerators in which only 2 percent of participants were dissatisfied with the 1.0 gpm aerators.
- Two residential indoor water conservation studies conducted by Aquacraft (2000, 2004) surveyed consumer satisfaction among participating single family households in three study areas. Survey findings reveal that participants were satisfied overall with the low-flow faucet aerators that were installed as part of each study, averaging at least 4 out of 5 on level of satisfaction (5 being most satisfied). The level of satisfaction among participants increased between the studies, from 22 percent “liking the new aerators more than their old faucet fixtures” in 2000, to 40 percent in 2003, and to 60 percent in 2004. This suggests that the performance of low-flow faucet aerators has increased over time, leading to the assumption that technological innovation and/or behavioral shifts have influenced customer perception of the performance of low-flow faucets and aerators. While the 2000 study does indicate some issues with longer wait time for hot water, this is not a universal issue, and no such issues were reported in the 2004 study. The surveys were conducted using the following flow rates:
 - Seattle, WA (2000) - 1.0 gpm and 1.5 gpm aerators in 37 households.
 - Tampa Bay, FL (2004) - 1.0 gpm (lavatory) and 1.5 gpm (kitchen) aerators in 26 households.

Water Savings:

Contrary to the concern in the Staff Report that hot water wait times for low-flow faucets negate water savings, there is evidence to suggest even with longer wait times there is still significant potential water and energy savings with 1.0 gpm lavatory faucets.

- Not all water used in lavatory faucets is hot water. Between 30% (WaterSense 2007) and 50% (EBMUD 2003) of faucet water use is estimated to be cold water. These values do not distinguish between lavatory and kitchen faucets, but the estimates are used in the absence of additional information for lavatory faucets in isolation. Even when using the lowest estimates for

cold water use, the 1.0 gpm standard would result in an additional **7.5 billion gallons** of water saved annually for cold water alone.

- Only one-quarter of respondents reported waiting for hot water to arrive in order to perform typical tasks such as hand and face washing and brushing teeth (Hoeschele & Weitzel 2012).
- There are a number of variables that determine the time it takes for hot water to reach residential lavatory faucets (CEC 2005, Wilson 2009, Hoeschele & Weitzel 2012), but the most significant is the design of the hot water distribution system - distance between the water heater and the tap, pipe diameter, flow rate of the faucet, type of water heater (storage or tankless), inlet and outlet water temperatures, ambient air temperature and climate, type of piping material, how much time has passed between hot water draws, and whether the pipes and/or water heater is insulated.. While a 1.0 gpm faucet might have a longer hot water wait time than a 1.5 gpm faucet, generally the same *volume* of water will need to be evacuated from the hot water distribution system.

Miscellaneous Issue:

One commenter to this docket has suggested that reduced demand and higher efficiencies in building plumbing systems are now resulting in storage of water for such a long period of time within pipes that user health may be jeopardized. Protecting public health is of the utmost concern to NRDC; however the attribution of pathogen occurrences to water-efficient plumbing fixtures and fittings is not substantiated, neither in the comment nor in peer reviewed literature. There is no research-based evidence that demonstrates that there is more risk of exposure to pathogens from a residential lavatory with a maximum faucet flow rate of 1.0 gpm than from a faucet with a 1.5 gpm or 2.5 gpm maximum flow rate.

WALL-MOUNTED URINALS

The CASE report submitted to CEC in July 2013 and the addendum submitted in February 2014 provides information on the cost effectiveness, technical feasibility, and product efficacy in support of NRDC and the CA IOUs proposal to set a standard of 0.125 gpf for wall-mounted urinals. It should be noted that the CEC staff recommendation to set the standard at 0.5 gpf will garner the state *no additional water or energy savings* because the proposed standard is already state law, as enacted by AB 715.

In response to NRDC and the CA IOUs proposal, the Staff Report noted that, “although there are 0.125 urinal models (called ultra-low volume) available on the market, CEC staff decided not to recommend setting this standard for wall-mounted urinals because:

- Ultra-low volume urinals require significantly more maintenance than those with a flush volume of 0.5 gpf to avoid mineral clogging, pipe corrosion, and high odor that results from the lower volume of water used.
- There is a lack of support provided from manufacturers for setting standards at 0.125 gpf for urinals
- There is risk of consumer rejection and backlash for future standards development when technologies improve or infrastructure is replaced.”

NRDC respectfully disagrees; there is no research-based data to indicate that 0.125 gpf urinals cause significant damage to building drain line systems. The City of Los Angeles has had a 0.125 gpf ordinance in effect since 2010 and had not had any reported problems. In addition, the Seattle Public Utilities performed a survey of high efficiency toilets, and seven out of nine facilities managers had no reported issues with the 0.125 gpf urinal installations. Two reported higher maintenance costs and

cleaning due to urinal splashing and clogging concerns, although these issues were described as urinal design issues rather than building pipe issues.

Manufacturers are not always initially supportive of policies and regulations that impact the sales of their products; this should not be an acceptable reason to not advance water efficiency to the extent feasible in a state suffering from the impacts of a serious drought.

While we do not believe the risks of consumer backlash have been substantiated, NRDC would support a tiered proposal, such as that put forth by the CA IOUs in the June 6, 2014 letter to CEC, in order to provide additional time to give manufacturers more lead time to optimize their products for improved performance at 0.125 gpf, develop maintenance guidelines to mitigate potential drain-line issues, and train facility managers on maintenance best practices.

CONCLUSION

We urge the CEC to further consider the proposed standards for residential lavatory faucets and urinals. If the CEC does not choose to support stricter standards than those in the Staff Report, or consider phasing stricter standards in over time, NRDC will consider dropping support for new standards. NRDC would rather postpone the adoption of efficiency standards than lock the state into standards that do not establish a clear path forward towards cost-effective water and energy savings. Given the current drought, projections for increased drought frequency and intensity as a result of climate change, and an ever increasing state population; California cannot afford to put on hold the implementation of technically feasible and cost effective solutions to use water more efficiently. Taking these steps now, the CEC can help California save enough water to supply over **220,000 homes** and energy equivalent to the greenhouse gas emissions of taking **138,000 cars** of the road.

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