

## DOCKETED

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## **Rebate Fixtures, NOT just appliances!**

Time to replace California's remaining old water-wasting "legacy" toilets:

Over the past 20+ years, California water providers and their customers have done a great job replacing old water-wasting toilets (3.5 and more gallons per flush) with new models that perform better and use less water. However, the "job" is not yet complete. We conservatively estimate that over 4 million of these old toilets still remain in homes and apartments throughout the state. Without passing any new laws or regulations, without adopting any code changes, and without the arduous processes that sometimes typify state government, immediate action can be undertaken in 2015 to complete the replacement "job". Replace those water wasting fixtures now with new high-efficiency toilets (HETs) and achieve immediate potable water use reductions amounting to about 100,000 acre-feet per year. See the attached summary for further detail.

Disclaimer: The author of the attached summary has no financial or other interest in the companies that would provide the suggested replacement services, nor any such interest in the manufacturers or products that might be involved in a replacement program.

*Additional submitted attachment is included below.*



## California Legacy Toilet Replacement Program

By John Koeller, P.E.

Although many toilet replacement programs have been successfully implemented in California in the past 25 years, there still remains a remnant of water-wasting 'legacy' models, i.e., those toilet models with flush volumes of 3.5, 5.0, and 7.0 gallons per flush (gpf). According to the 2005 Potential Best Management Practices study by the California Urban Water Conservation Council<sup>1</sup>, there were about 8.7 million of these older non-efficient toilets still installed in California residences in 2005<sup>2</sup>. Assuming that figure has been halved by 2013 through normal replacement and water utility conservation programs, it means that about 4.3 million legacy toilets still exist in residential dwellings today (many of which are likely installed in low income dwellings, particularly apartments).

The 'Legacy Toilet Replacement Program' initiative would replace remaining non-efficient toilets in the state with High-Efficiency Toilets (HETs) compliant with AB715. To the extent funding is made available for such an aggressive program, this is where significant indoor water savings (and related energy savings) can be achieved in the short-term without relying upon changes to codes or standards.

Attachment A provides a rough analysis of the potential short-term savings using CASE report and other data. The predicted annual water savings from replacing the 4.3 million Legacy toilets amounts to approximately four times the CASE proposal's estimated savings from toilets. And, with a well-executed program, these savings would occur in a much shorter time span.

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<sup>1</sup> California Urban Water Conservation Council, 2005. "Potential Best Management Practices (PBMP) Report: High Efficiency Plumbing Fixtures – Toilets and Urinals", Prepared by Koeller and Company.

<sup>2</sup> The estimate of 8.7 million non-efficient residential toilets is consistent with the statement in the CASE report, "Toilets & Urinals Water Efficiency, CASE Initiative for PY 2013: Title 20 Standards Development, Analysis of Standards Proposal for Toilets & Urinals Water Efficiency", dated July 29, 2013 (docketed July 29, 2013), page 22, which states "The study found that about 67 percent of the installed toilets met the existing federal efficiency standard, having rated flush volumes of 1.6 or less." The remainder of 33 percent (of 24.6 million total) amounts to 8.1 million non-efficient residential toilets.

## REPLACING NON-EFFICIENT LEGACY TOILETS IN CALIFORNIA

Target: replace 4.3 million existing Legacy toilets flushing at 3.5, 5.0 gpf and above.

- 4.3 million toilets serve an estimated 6.65 million people<sup>1</sup>.
- That population flushes 4.76 times per day<sup>2</sup> = 31.7 million flushes per day
- Assumed average savings per flush = 2.4 gallons (3.5 & 5.0 reduced to 1.28)
- Overall savings = 2.4 x 31.7 million flushes = 76 million gallons per day = 233 Acre-Feet (AF) per day
- 365 days x 233 AF/day = 85,100 Acre-Feet per Year (AFY) = 27,700 Mgal/yr
- 25-year life of the fixtures<sup>3</sup>: 25 x 85,100 AFY = 2,130,000 Acre-feet saved over the life of the 4.3 million replacement toilets.

*It should be noted that, on an annual basis, water savings (and energy savings) from this program are 4 times the savings forecasted in the CASE proposal.*

Historically, four program types have been used in the past 20 years to achieving toilet replacements in the residential sector: rebates, voucher redemptions, free distribution, and direct installation. Each program type possesses distinct advantages and characteristics; these are summarized in the table on the following page, the most expensive approach being direct installation wherein the customer benefits from a fully installed free toilet. Recent direct install programs in Southern California have cost the water utilities about \$220 per fully installed toilet. The other three program types are less expensive because the responsibility for toilet installation rests with the customer/homeowner.

Estimated program costs per AF of water savings are summarized in this table for each of the four types.

### Program types and water savings

	<i>Rebate</i>	<i>Voucher</i>	<i>Distribution</i>	<i>Direct Installation</i>
Replace toilets	4.3 million legacy toilets			
Implementation cost per replaced toilet	\$120	\$140	\$165	\$220
Total program cost for 4.3 mil replacements (\$mil)	\$516	\$602	\$710	\$946
Total water savings	2.130 million AF			
Program cost per AF saved	\$242	\$283	\$333	\$444

A combination of program types is required to effectively reach all demographics in the state. We estimate the development and implementation of such programs could begin in 2015 and, with aggressive marketing and outreach, could achieve 70 percent replacement within two years.

<sup>1</sup> "Toilets & Urinals Water Efficiency, CASE Initiative for PY 2013: Title 20 Standards Development, Analysis of Standards Proposal for Toilets & Urinals Water Efficiency", dated July 29, 2013 (docketed July 29, 2013), Table 5.3: 37.3 million population – 24.1 million residential toilets; equals 1.55 persons per residential toilet.

<sup>2</sup> ...ibid, Table 5.3: Flushes per person per day: 4.76; It should be noted, however, that the generally reported national average is 5.1 flushes per person per day.

<sup>3</sup> ...ibid, page 21: "...product lifetime of 25 years..."

## Characteristics of Typical U.S. Water Utility Toilet Replacement Program Types

	Rebate Program	Voucher Program	Distribution Program	Direct Installation Program
Program cost to sponsoring water authority (cost per unit)	Lowest cost of all types = Rebate amount plus approximately \$15-25 for rebate processing by outside firm.	Slightly higher cost than rebate due to retailer recruiting and involvement = Voucher amount plus approximately \$20-40 for establishing relationships and processing vouchers.	Free to customer; will cost water authority \$120 to \$170 for a high-volume program using commodity HETs.	Most expensive program type; cost will depend upon type of fixture installed for the customer; current range is \$200 to \$240 per installed toilet.
Selection of toilet fixtures	By the customer (selection may be restricted by the water authority to an "approved toilet list")	By the customer (selection may be restricted by the water authority to an "approved toilet list")	By the water authority and the implementation contractor; customer choice (if any) is limited to a few models on hand.	By the water authority and the installation contractor; customer choice (if any) is limited to a few models on hand.
Purchase of toilet fixtures	By the customer	By the customer	By the program implementation contractor	By the installation contractor (plumbing contractor)
Toilet fixture installation	By the customer	By the customer	By the customer	By the installation contractor
Used toilet disposition	None provided for in the program; toilet may end up being re-used.	None provided for in the program; toilet may end up being re-used.	Dismantling, destruction, and recycling by the implementation contractor.	By the installation contractor or the water authority.
Retailer involvement in program	Retailer sells toilet to customer.	Retailer sells toilet to customer and accepts a water authority voucher as cash for full or partial payment.	No involvement	No involvement, except to the degree that installation contractor acquires fixtures at retail.
Program implementation and administration	By the water authority or, in the case of a large program, by a rebate processing contractor.	By the water authority or, in the case of a large program, by a marketing contractor and a voucher processing contractor.	Primarily by the implementation contractor, with oversight by the water authority.	Primarily by the installation contractor, with oversight by the water authority.
Installation verification	Required; a statistically valid sample of rebated installations should be physically inspected.	Required; a statistically valid sample of vouchered installations should be physically inspected.	Required; a statistically valid sample of installations should be physically inspected.	Not required; installations performed by program personnel.
Special facilities requirements	None	None	Warehouse; distribution center; used toilet receiving and dismantling yard.	Possibly a warehouse
Popularity of program type	Most popular of all program types.	Very seldom used, due to need to develop strong, continuing relationships with plumbing retailers in the area and process voucher reimbursement claims from those retailers.	Second most popular program type, because of the volume of toilet replacements that can be achieved in a very short time period.	Also seldom used, because of the inherent program costs and contingent liabilities.