

7.2 Residential Clothes Washer Incentive Program

Applicability

This Best Management Practice can be implemented by any Municipal Water User Group (“utility”) that has residential customers. Once a utility decides to adopt this Best Management Practice, the utility should follow it closely in order to achieve the maximum water efficiency benefit. Many utilities have initiated some of the program elements listed below and can provide documentation of previous clothes washer incentive programs and can serve as a mentor and point of contact.

There is no question that newer efficient washing machines use less water than older models. However, due to stricter efficiency standards and the increase in market penetration of these higher efficient machines, utilities must acknowledge that consumers have started to accept these machines and may not need an incentive/rebate. If a utility chooses to implement this Best Management Practice, there is a risk of the program becoming a “Free Rider,” which translates into a program that provides an incentive/rebate to a customer that would purchase the equipment regardless of the incentive. This risk should be taken into account when doing analyzing of the option and designing the program.

It is important to note when drafting the municipal water demand projections, Texas Water Development Board staff included automatic reductions of water use due to assumed replacement of clothes washers from older to new models over time. Applied to projected populations, staff assumed that future populations between 2010 and 2020 will have per-person water savings of 5.56 gallons per person per day for top-loading washers (40 percent of new washers), as compared to the 2010 base water use, and 6.67 gallons per person per day for front-loading washers (60 percent of new washers).

After 2020, the anticipated difference in savings between top- and front-loading washer narrows and future populations are projected to have a composite savings of 6.45 gallons for both types of washers. The 2010 utility customers are assumed to replace their washers with a replacement rate of 12 years. This rate of savings should be considered prior to implementing a clothes washer incentive program. For more information regarding the population and water demand projections in the regional and state water plans, please go to www.twdb.texas.gov/waterplanning/data/index.asp.

Description

Under this Best Management Practice, the utility would develop and implement an incentive based program to encourage residential customers to purchase high-efficiency clothes washers. Water efficiency for clothes washers is best described by using water factor terminology. Water factor is calculated by dividing the volume of water used to wash a full load of clothes in gallons by the capacity of the washer tub in cubic feet. For example, a washer using 27 gallons for a full

load of clothes and a 3 cubic foot tub would have a water factor of 9 gallons per cubic foot. A lower water factor results in a more water efficient machine.

Conventional top-loading clothes washers use 41 gallons per load on average while high-efficient clothes washers use 11 to 25 gallons per load. The typical household washes an average of just more than one load per day. Manufacturers started producing efficient clothes washer models in the late 1990s in anticipation of rules adopted by the U.S. Department of Energy setting higher efficiency standards. The agency adopted the first set of rules in 2001 and continues to revise the minimum efficiency standards improving the water efficiency of qualified machines.

A clothes washer incentive program is most effective when offered in conjunction with local gas and/or electric utilities as the incentive can be increased along with the marketing. The energy savings are a result of more efficient motors, less energy required for heating hot water as less hot water is used, and shorter drying time because the spin cycle on efficient washers is faster. Many water utilities in Texas and other parts of the country have already successfully partnered with local energy companies.

Incentives should be given only to those customers who install washers that qualify as water efficient. A list of efficient washers is maintained and regularly updated by the Consortium for Energy Efficiency, a nonprofit public benefits corporation that develops national initiatives to promote the manufacture and purchase of energy-efficient products and services. The U.S. Department of Energy and U.S. Environmental Protection Agency both support the consortium through active participation as well as funding. The Consortium for Energy Efficiency Residential Clothes Washer Program has tiers for both water and energy efficiency. The group's list has been used by many utilities as the source of qualifying washers to receive an incentive.

Efficient washing machine sale trends:

- In 2001, the Texas Legislature passed legislation requiring washing machine manufacturers to report on the efficiency of clothes washers sold in Texas.
 - 2002 showed that 4.4 percent of washers sold in Texas had a Consortium for Energy Efficiency water factor equal to or less than 9.5.
 - 2003 showed that 9.4 percent of washers sold in Texas had a Consortium for Energy Efficiency water factor equal to or less than 9.5.
 - According to the tiers recommended by the Consortium for Energy Efficiency in 2011, a high-efficient clothes washer would need to have a water factor equal to or less than 6.0 to be considered a high-efficient washing machine.¹ This represents a 36 percent efficiency increase since the 2001 program requirements.
 - 2006, showed that 38 percent of all washers sold were ENERGY STAR, an international standard for energy efficient appliances created by the Environmental Protection Agency and the Department of Energy, up from 27 percent in 2004, when new criteria took effect.

- In 2009, more than half (56 percent) of all clothes washer models available for sale in the United States were ENERGY STAR qualified.
- According to 2009 ENERGY STAR Qualified Appliance Retail Sales Data, 45 percent of all washing machine sales in Texas were ENERGY STAR rated.
- The national market share of ENERGY STAR qualified clothes washers quadrupled between 2000 and 2007, growing from 9 percent to 42 percent.

Implementation

The program should be offered to customers in single-family homes (including duplexes and triplexes) and in multi-family units that have in-unit washer connections. Approach the local gas and/or electric utility to join in a partnership to implement the program, organize stakeholder meetings, develop a marketing plan for educating customers, appliance stores, and realtors about this program, and initiate the program.

In an effort to eliminate the potential of the program becoming a “Free Rider,” the utility needs to analyze several factors periodically including but not limited to:

- What machines are for sale at local vendors?
- What is the local vendor inventory?
- What are the local market sales?
- What are the state market sales?
- How do customers determine what machines to purchase?

If at any point the utility discovers the program has become ineffective, even if the number of rebates processed is high, the rebate program guidelines must be adjusted or eliminated to ensure proper water savings investment. The fundamental question to determine is whether the rebate can be designed to have most of the payments result in an effective incentive and not a free-rider reward.

Scope and Schedule

The following schedule should be considered:

1. Analyze the market and customer acceptance of efficient washing machines to determine if a rebate is needed.
2. Determine if a pilot effort or permanent program option is desired.
3. Plan, implement, and market an efficient clothes washer incentive program within six months of adopting this Best Management Practice. Water purveyors who have implemented this type of program have the following suggestions to include in planning steps:
 - a. Include retail centers where washing machines are sold in program outreach. It may not be necessary to expend funds on advertising if retail locations use the program to promote the more efficient machines.

- b. Consider potential fraud when designing application materials. Allowing copies of receipts as rebate documentation may lead to multiple applications processed by several individuals for one purchase. Create an option for customers who may need their receipts returned or who may be reluctant to mail an original receipt.
- c. Retail centers often have different coding on their receipts than models listed on the Consortium for Energy Efficiency lists. It is a good idea to check major retail centers and request that they be clear in receipt documentation or that they provide a list to allow staff to determine model number based on their coding system.
- d. Consider web-based lists of eligible machines that can be linked to source material such as the Consortium for Energy Efficiency. This provides automatic updates as lists change. Clarify how eligibility will be assessed on the customer application.
- e. Determine before offering program if households replacing efficient machines are eligible for the rebate and if individuals may apply for more than one rebate over time. Clarify this policy on the application.

Measuring Implementation and Determining Water Savings

The program is evaluated based on a formula taken from the American Water Works Association Residential End Uses of Water study which takes into consideration the difference in the average water use between the standard and high-efficient machine and the number of loads washed each year. Water savings formula may need to be adjusted in accordance to any changes made to the efficiency specifications set forth by Consortium for Energy Efficiency.

Annual water savings calculations per machine or per rebate

- Standard washing machine water factor = 13.3 gallons per cubic feet
- Average Cubic foot of laundry per Machine = 2.77 cubic feet
- Average Loads Washed per Year = 392
- Annual Consumption = $13.3 * 2.77 * 392 = 14,442$ gallons

- Tier 3 High Efficiency Washing Machine Water Factor = 4.0 gallons per cubic feet
- Average volume of laundry per Machine = 2.77 cubic feet
- Average Loads Washed per Year = 392
- Annual Consumption = $4.0 * 2.77 * 392 = 4,343$ gallons

Total Savings per Year = 10,099 gallons

Annual Water Savings Formula

$(\#rebates)(7.5loads/week)(52weeks)(25.8\text{ gallons saved per load}) = \text{total water savings}$

Cost Effectiveness Considerations

Rebates to customers for installation of water efficient clothes washers are the most significant cost of this program. If the rebate for the clothes washer is set too low, only those customers already planning to buy an efficient washer will do so. If the rebate is set too high, the utility will be overpaying for customers to retrofit.

To be effective, the incentive offered should bridge at least one-half of the gap in the price difference between the high-efficient machines and conventional ones. Fully-featured inefficient machines cost approximately \$400 while the least expensive high-efficient machines cost from \$600 to more than \$1,000. For the least expensive machines, the price difference is \$200 and is the most important part of the buying decision for low-income customers. Most utilities that implement this Best Management Practice have found a rebate may be effective if set between \$50 and \$100 per high-efficient clothes washer. If partnering with an energy utility, the gas or electric utility rebate may add an additional \$50 to \$100.

Some utilities have started offering tiered rebates based on the efficiency of the washer with higher rebates offered for washers in the lowest water factor tier. With the acknowledgement of market sales, budget constraints must be considered if a tiered rebate system is implemented. Utilities may want to consider doing a pilot program at first to assess the level of interest and market. A pilot may be more easily capped and ended depending on results. A survey of pilot program participants could determine if the rebate was an effective incentive or simply an appreciated reward for customers who would already have purchased the efficient machines. A key survey question would be to assess if customers replaced a less efficient machine or if the recent purchase was to replace a machine that already met efficiency criteria.

Administration of the program can be conducted by utility or contracted staff. Washer inspections are sometimes performed in order to verify installation and discourage fraud. Labor costs range from \$15 to \$35 per clothes washer. Marketing and outreach costs range from \$5 to \$15 per clothes washer. Administrative and overhead costs range from 10 to 20 percent of labor costs. To calculate the total cost per unit, total all costs and divide by the number of units being retrofitted.

Program Cost Analysis

- Total Savings per Year = 10,099 gallons
- Total Savings over Equipment Life (10 yrs) = 100,990 gallons or 0.31 acre-feet
- Rebate = \$100.00 per qualified machine
- Cost per Acre-foot of Water Saved - \$322.58

****Note****

- This analysis is based on a program that rebates \$100 for current Tier 3 machines with a water factor of 4.0.
- This calculation also assumes an “effective rebate incentive.” If the rebate is a free-rider, there are no associated water savings.

References for Additional Information

- 1) Consortium for Energy Efficiency Clothes Washer Page
<http://www.cee1.org/resid/seha/rwsh/rwsh-main.php3>
- 2) *Waste Not, Want Not: The Potential for Urban Water Conservation in California*, Pacific Institute, November 2003.
http://www.pacinst.org/reports/urban_usage/waste_not_want_not_full_report.pdf
- 3) *Residential End Uses of Water*, AWWA Research Foundation, 1999.
- 4) *US DOE Volume Purchase Program*, Sandi Edgemon, Pacific NW National Laboratory, 1997.
- 5) *Impacts of Demand Reduction on Water Utilities*, AWWA Research Foundation, 1996.
- 6) Alliance for Water Efficiency Resource Library website:
<http://www.allianceforwaterefficiency.org/resource-library/default.aspx>
- 7) *BMP Cost Savings and Guide*, California Urban Water Conservation Council, July 2000.
- 8) *Seattle Home Water Conservation Survey*, Aquacraft, Inc., 2001.
<http://www.aquacraft.com/>
- 9) *Handbook of Water Use and Conservation*, Amy Vickers, Waterplow Press, May 2001.
- 10) California Energy Commission
http://www.energy.ca.gov/appliances/clothes_washers/notices/2003-09-17_Washer_Final.PDF
- 11) Energy Star, http://www.energystar.gov/index.cfm?c=clotheswash.pr_clothes_washers
- 12) Austin WashWise Program, <http://www.ci.austin.tx.us/watercon/sfwasher.htm>
- 13) *Seattle Home Water Conservation Study*, Aquacraft Inc., 1999
<http://www.aquacraft.com>