

TECHNOLOGY-DRIVEN REDUCTIONS IN CII WATER DEMAND: POLYMER BEAD WASHERS

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Background

In 2015, Tucson Water began a Commercial, Industrial and Institutional (CII) conservation program featuring water audits and customized rebate offers. Analysis of the largest CII customers revealed that more than half generated laundry.

A wider survey of CII customers revealed that commercial-scale clothes washing is a significant water use. Big users included: university, resorts, prisons, casinos, and medical centers.

High-efficiency CII Washers

Several technologies are marketed to reduce water use for commercial-scale laundry facilities. Tunnel systems reduce water significantly, but are expensive and have large footprints. Water recycling systems similarly require large investments in money and space. Xeros bead technology machines are similar in size to conventional CII machines and can be leased or purchased. As a result, they provide a scalable option.

Pilot Study

A pilot study was conducted to evaluate the potential water savings associated with polymer bead clothes washers. The manufacturer made the following claims: up to 80% reduction in water use; near elimination of hot water use; 50% reduction in detergent and other laundry chemicals; shorter drying times; and increased lifespan of laundered items.



35-lb. Xeros machine installation

Machines were installed in a commercial laundry that washes a wide variety of laundry; at an upscale hotel where sheets and towels are washed; and in a YMCA, where the laundry is predominantly towels.

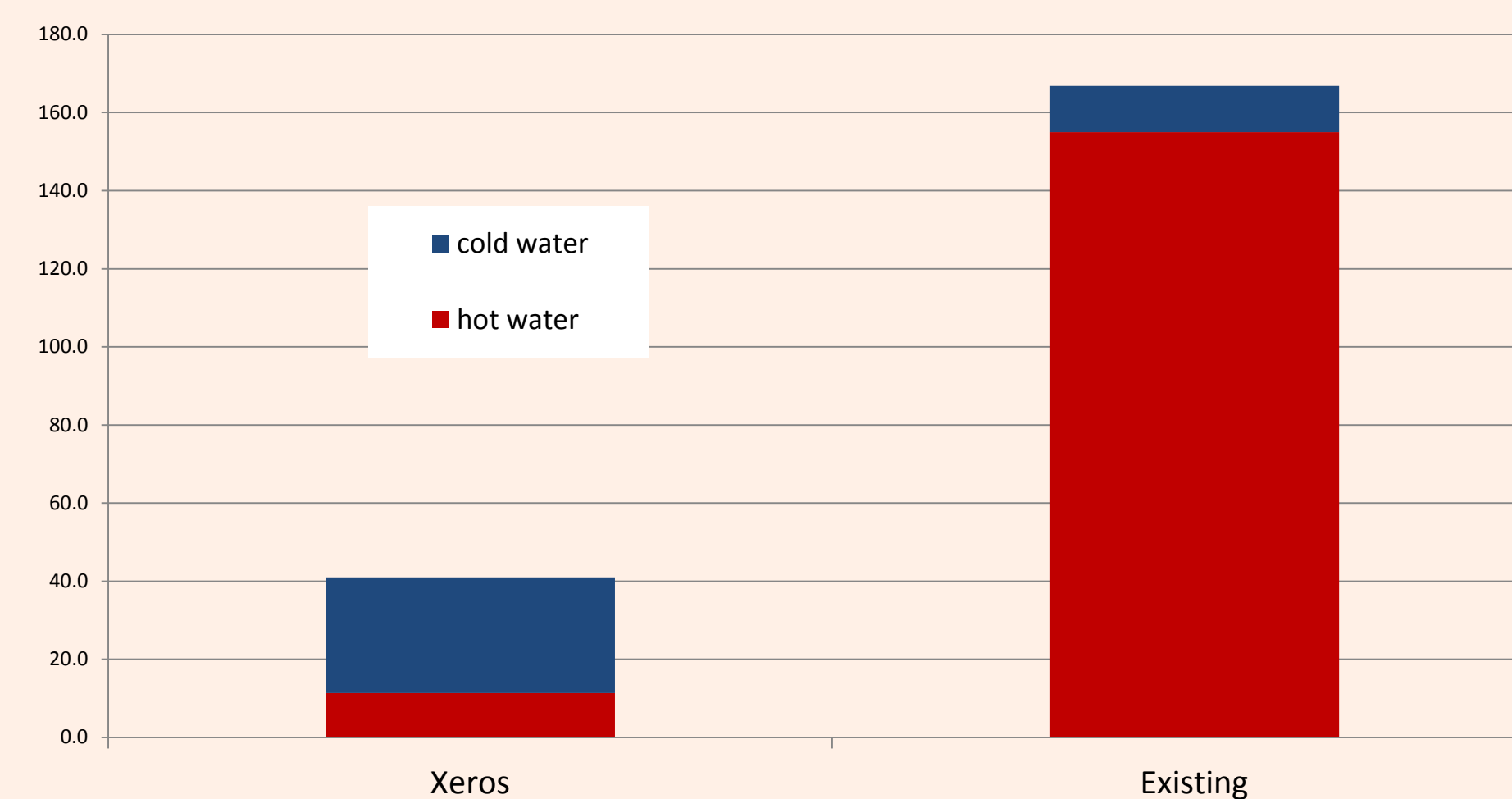


Logging water meters were placed on the hot and cold water inputs to a bead technology washer and an existing conventional washer at each study site.

Results

Logging meters on conventional and bead technology machines at each location recorded cold and hot water use. On average, the bead technology washers reduced total water use by 75-78%. Hot water use was reduced by 95-98%.

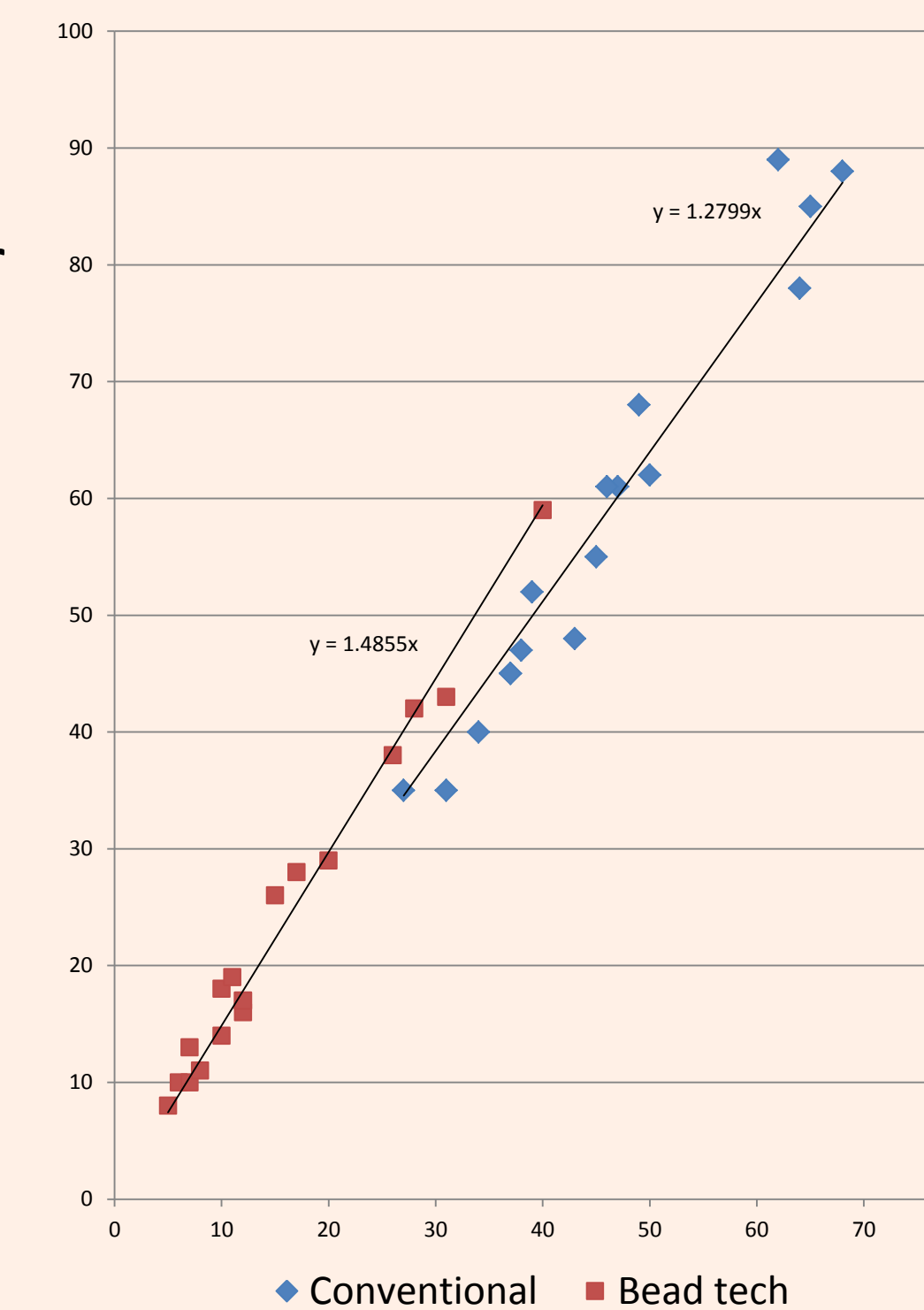
Water Usage per Load of Laundry



Bead technology machines spin faster in the final cycle, thereby theoretically removing more water and saving energy in the dryer.

Laundry loads of various types were weighed pre-wash and post-wash to determine water retention. Differences varied by type of fabric, being largest for absorbent materials like towels, where a 42% to 47% reduction was observed.

Post-wash vs. Pre-wash Weight (lbs)
Bead Tech vs. Conventional



Conclusions

Results confirmed the claims on water savings and reduced hot water use, and supported the claim of shorter drying times. No attempt was made to measure detergent use or the wear and tear on washed items, although anecdotal evidence was consistent with the claims.



Conventional & bead technology 65-lb. washers in a hotel laundry facility

The reductions in water, hot water, and retained water removed in dryers were used to estimate savings in water, sewer, and natural gas bills. Machines in moderate to heavy use reduced overall laundry costs.

Policy Implications

Based on the CII laundry survey, the potential impact of wide-spread adoption of this polymer bead washer technology was estimated. The bead technology appears capable of conserving significant amounts of both water and energy.

Claims for Xeros Bead Technology Washers:

- Reduces overall water use by up to 80%
- Nearly eliminates the use of hot water
- Reduces the use of chemicals by half
- Saves significant amounts of money
- Gentler wash prolongs the life of laundered items
- Provides a superior cleaning
- Reduces retained water by up to 50%
- Uses environmentally benign beads, chemicals

Pilot Study Findings:

- Reductions of 75% - 78%
- Reductions of 93% - 99%
- No data
- Yes, depending on utility rates, usage
- No data
- Anecdotal evidence in support of claim
- Up to 40-45% reduction in certain fabrics
- Appears to be true, no independent data

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