

Thermostatic Shower Restriction Valve (TSRV) Pilot Study

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CADMUS



TSRV Study Objectives

- Test product usability and functionality
- Collect data to support values in the 2015 PA TRM
- Evaluate energy savings
- Assess user satisfaction







How it Works

Exhibit A:

Shower w/o TSRV device



Exhibit B:

Shower w/ TSRV device







Data Collection







Metering Results

Parameter	Value	Units	Description
TSRV Event	59	Seconds	Average metered behavioral waste duration
# of Metered Events	581		Quantity of shower events metered
# of Shower Events	430		Quantity of TSRV events metered with a duration greater than zero seconds
Shower Event Time	9.5	Minutes	Average metered shower duration
Shower Water Temp.	104	۰F	Average temperature of water saved by the device
Structural Waste Time	64	Seconds	Average metered structural waste duration





Savings Per Measure

Annual Savings per TSRV				
Housing Type	2016 TRM Values	Water Saved*		
Single Family	121 kwh/yr	994 gal/yr		
Multifamily	113.1 kwh/yr	930 gal/yr		
Unknown/ Default	121 kwh/yr	1077 gal/yr		

* Based on a 2.5 GPM Showerhead with a TSRV





User Satis. & Device Usability







Conclusions

- Was the Study Successful?
- How are we using the results?
- Recommendations for further study?





<u>Sources</u>

- Estimate based on "ShowerStart[™]Pilot Project White Paper 2008." *City of San Diego and the Pennsylvania Power and Electric Pilot Study, 2014*.
- Section 4.2.4. GDS Associates, Inc. Pennsylvania Statewide Residential End-Use Saturation Study, 2012. For The Pennsylvania Public Utility Commission.
- Section 4.6.3. GDS Associates, Inc. Pennsylvania Statewide Residential End-Use Saturation Study, 2012. For The Pennsylvania Public Utility Commission.
- Cadmus and Opinion Dynamics Evaluation Team. Showerhead and Faucet Aerator Meter Study. For Michigan Evaluation Working Group. June 2013. Temperature sensors provided the mixed water temperature readings resulting in an average of 101°F. Inlet water temperatures were measured and a weighted average based upon city populations was used to calculate the value of 55°F.
- A good approximation of annual average water main temperature is the average annual ambient air temperature. Average water main temperature = 55° F based on: http://lwf.ncdc.noaa.gov/img/documentlibrary/clim81supp3/tempnormal_hires.jpg