

Improve Access to Customer Water Data by Pecan Street

Drawing on four years of lab testing, independent third-party evaluation¹, and data-intensive field testing of behavioral change tools, consumer water use and water metering systems, Pecan Street Inc. respectfully offers the following recommendations to the Texas Water Conservation Advisory Committee for inclusion in the WCAC's recommendations to the Texas Legislature.

Better water use data opens the door for significantly improved home water use management and leak detection. The value of this water use data is impacted significantly by its granularity and timeliness. Higher resolution, real-time data offer particular promise in promoting the development of connected home devices and mobile apps targeted to leak detection and more efficient irrigation system use. For instance, if the data provided to the customer (or her/his connected home device) comes at the end of the month and is rounded to the nearest 100 gallons, it will typically produce less conservation and leak detection impact than if a customer can be alerted in near real-time that a toilet flap is stuck open or that his/her sprinkler system used 1,700 gallons last night. Leak detection is also effective with meter reads collected every month and every other month, as is conducted in existing and legacy metering systems.

In the area of electric smart grid implementations, Texas is a national leader in ensuring that customers have access to their own data, including in real time. Texas can likewise establish national leadership in using data as a tool for water savings: (1) by ensuring that customers can securely view their own water use data from the day before on a mobile device and on the web; and (2) by making it possible for customers to purchase in-home devices that connect with the utility meter to provide real-time home leak detection and data-driven home irrigation management.

Such measures would make it possible for Texas water providers to achieve dramatic water use savings by harnessing the power of better data and voluntary, market-driven technology innovations.

¹ [http://waterfoundation.net/wp-content/uploads/PDF/1389391749-Watersmart_evaluation_report_FINAL_12-12-13\(00238356\).pdf](http://waterfoundation.net/wp-content/uploads/PDF/1389391749-Watersmart_evaluation_report_FINAL_12-12-13(00238356).pdf)

To achieve these benefits, Texas water providers should follow the best management practices established by the Texas Public Utility Commission (PUC) for ensuring that customers have timely access to their own use data:

1. Encourage utilities to adopt Smart real-time water meters: Most legacy water meters are read once each month or every other month. Utilities are encouraged and incentivized to install and replace manual meters with smart water meters (advanced metering infrastructure systems) that can record and wirelessly transmit water consumption on hourly intervals, or more frequently, to the utility, to the customer via software applications, and in-home monitoring devices.

2. Encourage water consumption access via software applications: Utilities should make cloud-based and mobile software available to all their metered customers, regardless of meter type, to enable them to see their water consumption data, compare their use with others, and be notified of potential leaks. Customers should be able to view historic data, download real-time water use data, and share this data with others in their home.

3. Permit in-home monitoring devices at the water meter: For those utilities without advanced metering systems, meters are usually read monthly or every other month. Should customers desire real-time water consumption data, they should have the opportunity to access their real-time water use by acquiring and installing an in-home device of the customer's choice. Devices should be able to either communicate securely with the utility meter or with a non-invasive add-on hardware sensor fitted to an existing meter or pipe, such as commonly used water meter data loggers.

4. Encourage water meter vendors to agree on a common data transmission protocol Electric smart metering systems almost universally broadcast meter data over open industry standards (the most common are ZigBee and ERT). The benefits of this approach include (1) Protecting utilities from being locked in to a meter vendor and (2) Promoting the development of connected-home products that consumers can pair wirelessly to the meter to access their data securely.

A number of different water metering vendors use their own proprietary radio networks. Because these networks cannot communicate with one another, this creates a substantial risk that any water utility will become vendor-locked to a single meter network. This also prevents a common standard from becoming adopted across the industry that would lead to a market for connected-home devices that can pair securely with the meter to provide services such as home leak detection and data-driven home irrigation management.

Smart water meter manufacturers should be given a two-year timeline to negotiate a common standard that would be adopted by the PUC and the industry.

Background on recommendation development

Pecan Street developed these recommendations after carrying out a wide range of real-world, data-intensive testing since 2012 that includes the following:

1. Lab and field testing over 30 models of water meters including legacy displacement meters, ultrasonic meters, advanced meters that broadcast over ERT and advanced meters that broadcast over a range of proprietary networks. Tests included battery life, meter accuracy, radio signal reliability and product reliability.
2. Operating two meter data networks (including operating collectors)
3. Carrying out over 15 behavioral and technology interventions to identify how customers interact with various technologies and the conditions in which customers modify behavior patterns in response to information
4. Building and operating four mobile applications and a web portal
5. Conducting annual research surveys that record demographic and home equipment information
6. Acquiring and managing over 270 million unique electric, gas and water use reads each month (9 million a day) at Pecan Street's datacenter
7. Testing over 40 consumer products in actual homes to measure customer response and the accuracy of product performance claims

The Water Foundation independently funded and evaluated a behavior change software platform across 10,000 water meters.²

² [http://waterfoundation.net/wp-content/uploads/PDF/1389391749-Watersmart_evaluation_report_FINAL_12-12-13\(00238356\).pdf](http://waterfoundation.net/wp-content/uploads/PDF/1389391749-Watersmart_evaluation_report_FINAL_12-12-13(00238356).pdf)