

Land Use and Water Efficiency: Submetering

In the arid west, cities and towns are faced with limited water supplies while preparing for significant population growth and related increases in water demands. To help address this challenge, there are several policies that can be enacted to ensure water efficiency opportunities are maximized in new homes, buildings, and developments. This factsheet provides information about one such option: submetering of water in multi-family residential buildings and multi-tenant commercial buildings.

What is Submetering?

Submetering of a building means that each unit (e.g. apartment, condo or commercial unit) has its own



Submeters. Image: Boston Water and Sewer Commission

separate water meter, and occupants (residential or commercial tenants, condo owners) pay for their individual use. This is different from the more traditional set-up of having a single water meter for the entire building, and including the cost of water in the rent or lease. Submetering not only provides helpful information to the occupants about their rate of water usage, it also provides an economic incentive to conserve water. Additionally, submetering allows for leaks to be more quickly and accurately.

A study in 2004,¹ sponsored by the U.S. EPA, ten municipal water utilities, and two national apartment associations, showed that submetering of water reduces annual consumption by an average of 15% as compared with “in-rent” properties. This research was based on statistical analysis of data from almost 8,000 properties across 13 cities in the West and southwestern region of the United States. Other billing methods were analyzed in this study, including the common Ratio Utility Billing System which charges for water based on square footage and number of residents, but no statistically significant water savings were associated with this approach.

¹ Mayer, Peter, Erin Towler, William B. DeOreo, Erin Caldwell, Tom Miller, Edward R. Osann, Elizabeth Brown, Dr. Peter J. Bickel, Dr. Steven B. Fisher. 2004. National multiple family submetering and allocation billings program study. Boulder, CO and Oakland, CA. <http://www.nmhc.org/files/ContentFiles/General/noapp.pdf>

Municipal Submetering Examples

Several states and municipalities have enacted submetering requirements expressly for the purpose of conserving water. Here are just a few examples of municipal ordinances and codes.

Denver, Colorado – In 2004, the Denver City Council passed an ordinance which requires all newly constructed multi-family buildings to be submetered.² The maintenance, repair and reading of these meters is the responsibility of the property owner. The entire building will also have one meter which will be read and billed by Denver Water (the water utility). Denver Water also provides rebates for submeters installed in existing multi-family buildings and commercial multi-tenant buildings.

Westminster, Colorado – The City of Westminster has integrated a multi-family submetering requirement into their city code.³ New developments other than single-family dwellings (attached or detached) must provide submeters for each individual unit. Submeters are the property of the owner, and thus the maintenance, repair and use of the submeters is the responsibility of the owner as well.

Sierra Vista, Arizona – In 2013, the City of Sierra Vista required all new multi-family developments with more than four units to provide submetering, with some exceptions.⁴ One exception is buildings with 80% or more low-income housing units, provided that alternative water saving designs are incorporated. Another exception is buildings that include prescribed water savings measures including insulation, short hot-water line distances, and a Ratio Utility Billing System (which assigns water charges based on metrics like square footage and the number of occupants). Exceptions are considered on a case-by-case basis.

San Diego, California – The San Diego City Council passed an ordinance requiring submeters to be installed in all new multi-family residential and mixed-use developments with three or more units, as of June 1, 2010.⁵ New, affordable housing units must be pre-plumbed to accommodate submeters, but there is no installation requirement. In addition, if the entire interior potable water plumbing system is being replaced in an existing multi-family building, then submeters must also be installed.

Issues to Consider

While submetering can be an effective water conservation measure, it needs to be supported by policies that ensure fair practices for residents. Highlighted below are some of the primary issues that should be addressed before submetering is implemented. It is also worth noting that several Best Management Practices regarding these issues were recommended in the aforementioned submetering study (Mayer et al. 2004).

² DENVER, COLO., ORDINANCE 576 (AUG. 17, 2004), <http://www.denvergov.org/web/candr/City-Ordinance/2004/20040576ord.pdf>

³ WESTMINSTER, COLO., CODE VIII § 8-7-4

<http://www.ci.westminster.co.us/CityGovernment/CityCode/TitleVIII/7WaterRegulations.aspx#18>

⁴ SIERRA VISTA, ARIZ., CODE §151.16 (2013). http://www.sierravistaaz.gov/egov/documents/1362605681_994476.pdf

⁵ SAN DIEGO, CALI., ORDINANCE 43 (APRIL 7, 2010) <http://www.sdcaa.com/Item202revordinancesub.pdf>

Addressing Accountability

Most often the maintenance, repair, reading, and billing of the submeters is the responsibility of the property owner or HOA, and these services may be performed in-house, or by a third party submetering company. Since there is no regulatory oversight for this, as there can be for a utility performing these functions, there is a need to provide protections to residents to prevent fraud, mistakes, and over-charging.

Some states and municipalities have addressed this issue by requiring charges to be itemized in water bills, ensuring occupant access to meter and billing data, prohibiting owners from charging more than the total water bill, and/or providing a process through which bills can be contested and reviewed. One example of these accountability measures is Texas' Tenant Guide to Submetered Water or Wastewater Service,⁶ and similar requirements have been established in North Carolina, Florida, and Georgia.⁷

Alternatively, communities can explore the option of direct metering by the water utility. New construction allows flexibility in the placement of meters, enabling easy meter reading by utility companies. This would remove the owner from the unit billing process entirely, and provide the residents the benefit of directly connecting to utility programs and information.

Considering Costs to Occupants

It is primarily the building owner's decision as to how water charges are allocated to occupants, within the bounds of local and state requirements. In most cases, if the owner hires a submetering company, the owner can – and will – pass on the fees associated with providing this service on to the occupants. In addition, the building owner can choose to not reduce the rent after submetering is implemented, even though a portion of the rent initially covered the cost of water. This is of course in the owner's financial interest, and likely the prevalent practice. These choices will result in an increase in occupants' overall monthly costs, and the effect of this should be considered when enacting submetering policies.

The way in which common areas, like lawns and laundry rooms, are paid for requires some consideration. To promote water conserving behavior, each unit should pay directly only for the water they use in their unit. Charging for common areas in the water bill may dilute the economic incentive occupants would otherwise have to conserve water. Common areas can be submetered, paid for by the owner, and ultimately included in each unit's rent, thereby preserving the conservation benefit of submetering.

Ensuring Efficiency

While submetering does tend to reduce water consumption, it's important to make efficiency improvements before implementing submetering. With submetering, property owners are no longer paying the water bill for each unit, and so they lose the financial incentive to install more efficient

⁶ Texas Commission on Environmental Quality. Water Supply Division. 2013. "Tenant Guide to Submetered Water or Wastewater Service" GI-277. <http://www.tceq.state.tx.us/publications/gi/gi-277.html>

⁷ Murray, Barbara. 2012. "Going Down the Drain" MHN Online, March 5. <http://www.multihousingnews.com/features/going-down-the-drain/1004050166.html>

devices in each unit. For example, occupants may be incentivized to modify their *behavior* by submetering, but they will rarely, if ever, install more efficient devices on their own accord, and they may even be prohibited from doing so.

Therefore, if a building is moving to submetering, then the replacement of old, inefficient fixtures with new, efficient ones should happen first to ensure water savings. Similarly, leak detection and repair should be performed as well. The state of Massachusetts recognized these issues, and therefore required all showerheads, sinks and toilets to be water conserving devices, and installed at the landlord's expense prior to implementing submetered billing.⁸

Perfecting Plumbing

The plumbing requirements for submetering new high-rise buildings (4+ stories) may be more challenging than low-rise buildings, according to the aforementioned submetering study (Mayer et al 2004). Given the number of communities that have adopted submetering practices since the time of this study, these communities may have already addressed the issue, and may be looked to for guidance. However, if submetering high rise buildings is a persistent issue, the study recommends phasing in the submetering of low-rise buildings first, and high-rise building at a later date, to allow for sufficient time to address the technical plumbing needs.

Conclusion

Submetering water in multi-family residential buildings and multi-tenant commercial buildings has been shown to be an effective policy that saves water. Submetering is most easily implemented in newly constructed buildings because it can be integrated into the initial building design, but it can also be implemented in some existing buildings. There are important issues to consider regarding transparency and fairness to occupants, which should be addressed if submetering is adopted. A few states and municipalities have enacted policies to ensure fairness to occupants and to guarantee water savings with submetering, because the protection of occupants is as important as the protection of our limited water resources.

Additional Resources

Utility Management & Conservation Association: <http://www.utilitymca.org/>

National Multifamily Housing Council: <http://www.nmhc.org/>

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⁸ MASS GEN LAWS CH. 186 § 22 (2005) <https://malegislature.gov/Laws/GeneralLaws/PartII/Title/Chapter186/Section22>