2.4 Customer Characterization: Analysis to Prioritize BMP Selection

Applicability

This best management practice (BMP) is intended for all utilities. The effectiveness of municipal water conservation planning relies on the completion of a customer characterization analysis prior to the implementation of any water conservation BMPs. The practice of completing a customer characterization enables utility staff to learn how water is used within the service area, to recognize "normal" usage trends within each customer category, and to familiarize high consumptive users with more efficient practices for water use.

Failure to complete this analysis could result in spending resources on conservation practices with little impact for a utility. For example, if a utility has mostly new housing stock, it would be a poor use of resources to manage a large high efficiency toilet retrofit program for single family customers. If a utility has a strong summer peaking challenge, they may be best served by looking at BMP options that help address outdoor landscape issues.

The goal of the customer characterization process is to stimulate discussions and creative thinking that will benefit the water utility and its customers by targeting specific water conservation BMPs, that will allow the water utility the opportunity to leverage available resources to implement the most cost-effective water saving activities. Therefore, it is important that a customer characterization is performed, though the way it is carried out may vary by utility and customer base.

Why this is a Strategic BMP

The Texas Water Code §11.002 states that BMPs are voluntary efficiency measures that save "a quantifiable amount of water, either directly or indirectly," BMPs that are useful in implementing other measures but for whom quantifiable savings cannot be identified are described as Strategic BMPs.

Customer characterization is intended to act as a tool for municipal water conservation planning. The best way to ensure that chosen conservation BMPs are successful in reducing consumption and continue to target the correct audience is to conduct BMP evaluations before and after implementation, in addition to an annual customer characterization. Consistent program evaluations will indicate when a BMP is no longer producing a significant volume of water savings and will give the utility an opportunity to make adjustments.

Description

Customer characterization is an analysis to understand who your customers are and how they use water. Such understanding is an important step in ensuring that utility conservation goals are met in an effective and efficient manner. To keep the customer characterization process simple to understand and perform, recommended steps are outlined below. It is important to remember that this step-by-step process suggests a single method, not the only method, to complete a

customer characterization. Actual methods used will vary among utilities based on available information, time, staffing resources, and expertise.

Residential customers

1) Gather Data
   Data used in this example include billed consumption by account (available within the utility) and individual property information (available from local appraisal districts). It is also possible to utilize census demographics and any spatial data available from the city or appraisal district.

   Although multi-family properties like apartments and duplexes sometimes contain one billed water meter (and account) for multiple residences, they are considered residential for water use accounting purposes. Because of ownership and marketing needs, the utility may choose to look at these properties separately from their single-family properties for programming.

2) Prepare Data
   Preparing existing data for analysis includes removing nonessential accounts, separating accounts by customer category, and integrating property data into the consumption data set. Thorough preparation of the data will support easier identification of account characteristics across a wide range of consumption levels in the next phase.

   To accurately compare and sort data, the complete data set must be separated into similar customer use categories. A residential customer should not be compared to a non-residential customer on any scale, as the characteristics of these customer categories and the nature of their consumption are inherently different.

3) Analyze Data
   The initial analysis of residential customer data consists of yearly and aggregate consumption distributions by ranges of property build-dates and assessed home values compared to annual consumption. These distributions serve to identify the characteristics of high consumption accounts. It is appropriate to compare water use on a per capita (per person) basis when comparing single-family residential accounts because the nature of consumption is the same for most single-family residential customers.

Non-residential customers

Non-residential customers use water in different ways, even when compared to each other, so methods of normalization are necessary. Normalization is as simple as comparing water consumption per output. Car washes evaluate their efficiency in terms of gallons per car. Institutional, commercial, and industrial (ICI) or non-residential customers can be analyzed based on water consumption per dollar of revenue. The idea is to use terms that are comparable to each other without having to further sub-categorize customers.

1) Gather Data

   Non-residential customers are made up of industrial, commercial, and institutional (ICI) customers. This customer group is more difficult to categorize since it consists of many different uses of water, but doing so will allow for an accurate comparison between users of the same type.

2) Prepare Data

   The most complete list of categories can be found in the North American Industry Classification System (NAICS) which consists of two to six-digit coded categories that describe the type of use for each customer account. As utilities update their billing systems or customer relation management (CRM) platforms, they should consider starting a practice of adding a NAICS code to each non-residential account. The benefits of the practice are significant as they allow the utility to analyze use patterns by specific industrial or commercial categories. This analysis identifies high usage outliers to work with and may help with future rate setting practices.

3) Analyze Data

   It can be helpful to sort users from highest to lowest annual consumption and isolate a specified number of non-residential users with the highest annual consumption. The process of categorization can be applied to only those customer accounts that may allow the utility to realize the largest amount of savings instead of the entire data set.

Implementation

Strategic decisions about which BMP strategies to adopt and which customers to target should be derived from an analysis of water use patterns. If the strategic need of a utility is to delay a sewage treatment plant upgrade, then targeting older homes with higher indoor (winter) water usage rates would be logical. If, in contrast, the strategic need is to better manage peak demands during hot, dry summers, then targeting customers with the highest summer consumption is important. It has been common for utilities to adopt toilet replacement programs early in the planning process because high efficiency toilets save a considerable amount of water if they replace older high-flow toilets. However, the Energy Policy Act of 1992 passed national efficiency standards stating that toilets were not allowed to be installed in new development if they did not meet a 1.6 gallon per flush or less requirement. As a result, manufacturers no longer produce toilets with flow rates higher than 1.6 gallons per flush, and all development is currently required to meet this standard. In addition, manufacturers are moving to the updated EPA WaterSense Standard; and much of new fixture installation is meeting this target. Having data suggesting the market penetration of high efficiency fixtures versus older high flow ones is important before deciding that a retrofit program would be cost-effective. If a retrofit program is desired in a community of mixed age development, then the program requirements could be designed to expend funds only on older housing stock retrofits.

Scope & Schedule

Scope

The process of customer characterization is considered complete when groups of similar water users are identified, and their use has been evaluated for trends. There is no individual indicator that the process is complete across all utilities or water providers. Data may be analyzed in a very fine or coarse capacity, as deemed necessary by the utility, until enough information is presented to make informed choices for water conservation BMPs that best suit the service area. Utilities concerned with peak usage should complete analyses showing which customers contribute most to peak. Utilities concerned with overall growth in total annual demand may instead focus on which customers generate the largest annual usage increase.

Schedule

It is important for the process of utility customer characterization to occur prior to any water conservation BMP planning, as well as on a regular basis. Annual customer characterizations within the water utility will produce more accurate and informative trend data on water consumption within different customer categories. Managers will become familiar with normal usage trends and be able to better recognize anomalous and consistent high consumption levels. An annual process will also help managers target BMPs and be able to recognize, when accompanied with program evaluations, the point at which specific BMPs are no longer needed among different groups.

Cost-Effectiveness Considerations

There are no capital costs involved in performing a customer characterization, but it is a process requiring significant staff time or the services of a qualified contractor. It is important to note that the investment of time to complete this analysis will help ensure proper utilization of utility resources in the future.

It is expected that staffing costs incurred will be reduced over time as the process of customer characterization becomes more familiar and streamlined to fit the needs of the utility or water provider.

Determination of the Impact on Other Resources

Conservation programs are funded through municipal government utilities and water providers. Therefore, efficient time utilization through efficient water conservation planning saves tax-payer money as well.

References for Additional Information

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