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SHOP Targeting and Analytics

Executive Summary

It is important for the success of the SHOP program that customers with the highest potential for savings are enrolled in the program. Because there are two different technologies, and because we have access to the entire eligible customer list, we can be selective in terms of which customers we reach out to and the messaging/offers that we provide.

In order to improve our customer realization rate, we need to expand beyond the very limited set of customers that were originally on our outreach list, but we need to be more selective than a purely open enrollment. We can do this by analyzing the energy use patterns of our potential customers and tailoring our outreach accordingly. But we need to make better use of the data than what has happened to date.

This document describes how to take the data from the Master Customer List (MCL), transform it, and group customers into one of four categories: 1) Ignore; 2) Target for Thermostats only; 3) Target for Water Heater controllers only; 4) Target for both thermostats and water heaters.

If we maintain roughly the same enrollment rate as we are currently experiencing, and if our savings predictions are accurate, we should average about a therm of savings per customer we reach out to with this program. This will more than meet program goals, which gives us wiggle room in case the savings are less robust than expected or our enrollment rate declines.

Program Eligibility

In broad strokes, we are going to eliminate customers whose usage patterns suggest little room for success in the program. These will typically be customers with low annual consumption, very high annual consumption, and/or other erratic usage patterns. Customers we enroll into the Thermostat program will use significantly more of their energy heating their homes while customers we enroll into the Water Heater control program will use significantly more of their energy on baseload consumption. Some customers will experience both high baseload and high winter consumption and will be targeted for both technologies.

From the MCL, we should remove customers who are otherwise ineligible for the program first (lack of baseline, participated in other programs, etc.). This will leave us with our pool of participants. In Southern California, with its mild winters, annual gas consumption is relatively low compared to other parts of the country. Our cutoff for low performance will be 400 Therms per year. Any customer with fewer than 400 Therms consumed annually should be removed from our targeting list.

Other customers will be removed in subsequent steps.

Winter and Baseload Therms

We will assume that the average summer consumption of natural gas reflects the overall monthly pattern of water heating consumption of natural gas. This isn’t a perfect metric. There are homes with natural gas heated pools and spas, firepits, dryers, and cooking equipment. In these cases, our estimate of the available savings for water heaters will be somewhat inflated. However, for simplicity’s sake, we are going to assume that the average summer consumption represents the available baseload for water heating savings. The remainder of annual consumption we are going to assume is used for space heating. We calculate this by averaging the gas consumption of the four summer months (June-Sept), and multiplying that value by twelve to arrive at the annual natural gas consumption for water heating. To calculate the annual gas consumption for space heating, we subtract the annual natural gas consumption for water heating from the total annual consumption. **These two calculations need to be performed on the MCL and added to the file.**

This value will also allow us to calculate the percentage of annual usage that is “baseload” or attributable to water heating. This calculation will help us spot outliers. If the number is negative, or greater than 100%, we should eliminate these homes from our eligibility pool. The number can be greater than 100% if the average summer consumption is greater than the consumption in the rest of the year. The vast majority of these homes will be using gas to heat their pools or spas. Not only will the Aquanta not be helpful, the spa/pool heating will swamp any effects of our intervention and expose us to risk that we can’t control.

Savings Projections

Currently, the MCL provides savings projects across all potential measures as well as a rolled up “savings” value. We need to be more careful about how we project savings in these projects, as rosy projections now will only land us in hot water later trying to explain poor realization rates. To be clear, we are currently projecting 10%-20% total annual therms savings in our treated homes. This seems a bit optimistic. For expected Thermostat savings, we should only add the T-stat and the optimization savings (assuming these are additive estimates) and we should calculate this as a percentage of forecasted heating therms that we found in the above section. This will allow us to identify the homes that have high probability of T-stat savings. Same process for the water heater controller, but in this case we should just use the projected savings of the unit itself (consider any other measures bonus). **If any homes have a forecasted savings of less than 20 therms for either T-stat or WH controller, that technology option should be removed and these homes should be grouped into their technology-specific group.**

Final Groupings and projected Yields

This process should leave us with our four groups: 1) eliminated; 2) T-stat only; 3) HW controller only; 4) Both technologies. We also have an expected savings in Therms for each building based on this grouping along with a projected % savings for the building. We should use this number to evaluate our actual savings against and over time start to calibrate our predicted savings better.

The last step is to forecast our yields. To do this, divide the entire remaining dataset into to groups according to annual usage. For the top half, assign a predicted enrollment rate of 0.5% and for the bottom half, assign a predicted enrollment rate of 1.5%. These numbers should be refined over time, but we can use them to multiply against the projected savings to forecast our expected yield from the program. Roughly speaking, the math comes out to about a Therm in program savings per targeted customer. This is a number we’ll want to get more conviction on as the data improves.