

# **New Online Benchmarking Widget Motivates Utility Customer “Smart” Decisions**

## **An Innovative Web Benchmarking Tool Applies the MAISY 7+ Million US Utility Customer Electricity Use and Hourly Loads Database to Motivate Customer Energy and Peak Savings**

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### **Preface**

This 4-page paper describes shortcoming of existing benchmarking systems and benefits of using new MAISY Utility Customer Benchmarking Widgets. If you would like to go directly to a Widget demo (perhaps come back later to see details on why the MAISY Widget is superior), click here: <http://www.maisyenergyapps.com/demo.htm>

Otherwise, read on to see why current benchmarking approaches provide limited results and why the MAISY Widget can increase energy and peak savings.

### **Background**

Utility energy customer benchmarking refers to two very different kinds of energy use comparisons:

1. Comparing a single customer’s monthly electricity use over time
2. Comparing a single customer’s annual electricity use to similar customers (building/population).

There is no empirical evidence that # 1, monthly electricity use comparisons motivates customer efficiency/DR actions, probably because most of these comparisons provide only the last 12 or 13 months and provide no weather-adjustments to interpret year-over-year or monthly comparisons.

Current building/local population benchmarking comparisons in # 2, which are applied mostly at larger investor-owned-utilities, report as much as a 2 percent electricity use reduction impact. There is some question though about how accurate these claims are since lighting and air conditioning efficiency standards continue to decrease electricity use over time as existing incandescent lighting and AC units are replaced by higher efficiency equipment. However, even if building/local population benchmarking estimates of a 2 percent reduction in electricity use are reasonably accurate, this reduction is hardly a significant achievement considering that NREL estimates cost-effective residential electric savings potentials of about 20 percent. In addition, Department of Energy 2018 data show average residential DR program peak kW savings of 1 percent (for utilities that reported DR savings) and efficiency kWh savings less than ½ percent.

The objective of this paper is to identify shortcomings in current residential building/local population benchmarking applications and to introduce a new, cost-effective and more accurate and effective benchmarking tool that utilities can use to achieve greater demand response and energy efficiency savings.

### **Accuracy/Credibility Issues with Existing Benchmarking Results**

A review of two prominent residential building/population benchmarking options highlights accuracy/credibility issues with existing tools.

**EPA's Residential Home Energy Yardstick** provides a residential building/population benchmarking processes. Yardstick analysis considers dwelling unit size, number of occupants and fuel types along with monthly energy use for 12 months. Yardstick analysis scores user energy use compared to residential energy use data reflected in the Department of Energy's Residential Energy Consumption Survey.

Yardstick benchmark analysis is unreliable for most users because it ignores the presence of at least a half dozen important electric appliances such as swimming pool pumps, electric heating, electric cooking, electric clothes drying, etc. Users who have more than the average number of these electric uses will score poorly. In addition, all energy uses are converted to source energy BTU's which reduces scores for electric appliances since electricity source BTUs include generation, transmission and distribution losses making electric appliance BTU use about 3 times that of equivalent gas appliances in the calculations. These deficiencies have been pointed out by other evaluations such as the 2011 Washington State Department of Commerce report: "Home Energy Audit and Retrofit Including Home Energy Scoring."

**Some larger electric utilities have engaged outside firms** to provide a comparison of individual residential customer electricity use compared to similar customers. These applications typically use property tax record information on square footage and several other characteristics of the dwelling unit along with utility billing data. As with the Home Energy Yardstick, these comparisons raise credibility concerns because many important factors are not available in tax records including fuel uses for water heating, cooking, clothes drying, spa use, occupancy during the day, etc. that have a significant impact on electricity use. Any residential customer with electric water heating (not available on tax records) is likely to score poorly and dismiss these comparisons as unreliable. In addition these applications are expensive since required tax record and household information must be purchased from a commercial customer list company with costs of \$0.50 or more per customer record, billing data must be analyzed and models must be estimated for each utility service area.

Utility customers intuitively realize that generalized comparisons in the Yardstick and tax-record based benchmarks do not take into account many dwelling unit/household characteristics that influence electricity use so benchmarking results are often discounted or viewed skeptically.

### **Benchmarking Miscues**

A primary objective of building/population benchmarking is to encourage utility customer actions that reduce peak demand and electricity use. As indicated above, average DR and energy efficiency impacts in 2018 reduced utility peak demand by 1 percent and kWh by less than ½ percent.

Why haven't existing building/population benchmarking tools been more effective?

There is no empirical evidence (or common-sense expectation) that month-to-month kWh comparisons or the EPA Home Energy Yardstick have motivated utility customers to achieve DR or energy efficiency savings; consequently, the remainder of this paper focuses on building/local population benchmarking applications practiced by some of the larger electric utilities.

As the previous section points out, the generalized nature of existing benchmarking practices can lead to extraordinarily inaccurate rankings of an individual customer's electricity use relative to similar customers creating skepticism and a disregard of the results.

Several other characteristics of existing tools explain a lack of significant customer action. Some of the most important of these miscues are described below:

1. Utility customers are much more motivated by cost comparisons compared to kWh use comparisons. (For many utilities there is not a proportional relationship between kWh use and electricity bills because block rates charge more for greater electricity use. In this case reducing electricity use by x% can reduce the electricity bill by more than x% ).

2. In this age of internet interaction, engaging customers requires a short and quick linear connection from benchmarking information to action which is missing in existing tools
3. Effective calls to action require an engagement with customers demonstrating customized analysis with only customer information at hand. Requiring a customer to look up 12 months of electricity use is a non-starter for most customers.
4. Benchmarking Information presented by itself on a bill is an incredibly ineffective call to action motivation that requires customers to take additional steps with other communication channels/contacts reducing follow-through
5. Motivation to action requires confidence in the analysis results which, as indicated in the previous section, is a problem with existing benchmarking options

## Engaging Customers with a New Benchmarking Tool

MAISY Energy Apps Utility Customer Benchmarking Widgets overcome these benchmarking/local population tools shortcomings. Widgets reflect the (1) most up-to-date Web strategies, (2) application of the widely-used 7+ million customer Energy Use and Hourly Loads Database to guarantee benchmarking accuracy, and (3) results of research on utility customer motivational behavior to provide the greatest customer engagement possible.

An ideal customer benchmarking process should apply easily accessed customer information and comparisons that are meaningful to provide the greatest decision-maker value and motivation for action. Widgets achieve these objectives by:

- Providing an immediate online customer call to action with cost and emissions savings potentials
- Immediately connecting customers to utility, utility contractors and/or customer information required to achieve desired savings
- Engaging customers anonymously to compare their electricity costs and emissions to similar customers with a simple popup window
- Providing enough customer detail to make the customer comfortable that the comparison is an appropriate and accurate analysis based on analysis of a 7+ million utility customer record database
- Requiring only an estimate of annual electricity cost and basic equipment, dwelling unit and occupant data that can easily be provided by the customer in a single session without researching bills or other information
- Showing each customer's electricity costs and CO2 emissions percentile compared to customers with similar equipment, dwelling unit and demographics characteristics in their neighborhood
- Providing customer options to identify cost and emissions savings associated with efficiency targets – motivating action.

An optional Widget feature can apply data from a utility summary billing files permitting utility customer to enter an account number rather than an estimate of annual electricity costs. This information also provides additional accuracy with respect to benchmarking customer space heating and air conditioning uses.

## Additional Widget Benefits

**Increased Customer Satisfaction.** Customer surveys consistently show that providing customized customer information regarding their electricity use increases customer satisfaction.

**Customer Information.** Each Widget session results in an automated email to the utility describing benchmarking inputs, analysis results and target improvement session details. This information provides previously unavailable insights into utility customer Web visitor information, characteristics and aspirational efficiency improvement targets.

**Low Monthly Cost.** Widgets are provided as a SAS (software as service) so no upfront payment is required and the service can be discontinued at any time. Widget costs are low because they apply the 7+ million customer MAISY Utility

Customer Databases avoiding expenses required to develop population comparison statistics from expensive customer list data and analysis of utility billing file data.

**Easy Validation.** MAISY Utility Customer Database accuracy and reliability have been verified by hundreds of our clients (<http://www.maisy.com/clients.htm> ). We can also set up a free validation site where utility staff can “try-out” the Widget experience the Widget process.

### **Utility Application Details**

Widgets pop up on utility Web sites but are housed on our servers so no maintenance is required to provide continuous support to utility customers. All background analysis, updating and data support are provided by the Smart Grid Research Consortium/Jackson Associates. Just a few lines of coding are installed on a utility Web site to present a button or link to initiate Widget analysis.

Widgets pop up in front of the utility Web site with control returned to the utility Web site at the end of the process.

Widget support can include Web pages with energy efficiency/DR suggestions customized to each user session.

The widely-used and continuously updated Jackson Associates 7+ million [MAISY Utility Customer and Energy Use Databases](#) provides a unique, statistically reliable, and accurate source of ZIP area comparisons.

To view an online demo of the Benchmarking Widgets or to view additional information go to <http://smartgridresearchconsortium.org/indexwidget.htm>

### **About the Smart Grid Research Consortium (SGRC) and Jackson Associates**

The SGRC was founded at Texas A&M University in 2010 and converted to a consulting organization in 2011. The SGRC has provided business case analysis of various smart grid technologies for twenty utilities and joined with Jackson Associates in 2016 to focus on new technology applications (e.g., including solar, batteries, virtual power plants, microgrids) and customer-facing applications . Jackson Associates has more than 30 years’ experience with more than 200 electric utility, regulatory agencies, research organizations, equipment manufacturers and other energy-related organizations.

For additional information on the MAISY Utility Customer Cost/Emissions Benchmarking Widgets contact Jerry Jackson, Ph.D., Leader and Research Director, Smart Grid Research Consortium and President, Jackson Associates, 37 N. Orange Avenue, Suite , Orlando, FL 32801, 407-926-4048, 979-204-7821 (cell), [www.smartgridresearchconsortium.org](http://www.smartgridresearchconsortium.org), [jjackson@smartgridresearchconsortium](mailto:jjackson@smartgridresearchconsortium)