



# Interval Energy Consumption Data Helps Scottsdale, AZ To Better Manage Energy Usage

*Environmentally conscious utilities are helping their commercial and government customers find answers to substantiate their energy saving programs, by providing power consumption information on an incremental basis. An example of one such utility is Arizona Public Service (APS), the Phoenix-based power utility serving over 100,000 businesses and government entities in the Southwest.*

## ACCESS TO CONSUMPTION DATA EMPOWERS CUSTOMERS

### Why the spike?

Utility customers that have access to their building's energy consumption on a daily basis, in 15 minute intervals, have the power to make the changes that conserve both energy and money. How many company controllers look at their "lumped" electricity bill at the end of the month and are only left to make an educated guess as to why the total went up? Is the increase the result of the weather (Was last month hotter or colder than the month before?) Or, has some system within the building broken that is resulting in energy being wasted? Has a new source of energy consumption come online? Or is the increase simply the result of another rate hike? Answering the question may be very difficult or even impossible if one only has access to the monthly kWh total.

The same applies to an energy bill that is less than the month before. How much did the weather account for the change? How effective are the conservation programs that you've recently undertaken? And how do you project future energy costs if you don't have a good handle on how energy usage patterns and rate changes are affecting your charges currently?

APS customers use Automated Energy's Commercial Load Profiler (referred to within APS as EIS, or Energy Information Service) to obtain reports that show the amount of electric power consumed and its cost at user-programmable intervals, which could be daily or more often depending on the customer's needs. Current consumption can be compared with past consumption patterns, month over month, year over year, and the effects of temperature or rate changes on the cost of power can be factored out so that normalized energy consumption can be analyzed.

One of APS' customers that is having positive results from using the Load Profiler is the City of Scottsdale, Arizona. Scottsdale's city managers are responsible for the energy consumed in a wide array of public buildings including the city library, an event center, office buildings and a recreation center. One of the project managers for the Facilities Management Dept. has been using reports available through the EIS to quantify the energy savings produced by various energy consumption-reducing programs that the city has undertaken.

*"Before we had access to Load Profiler information, getting the buy-in from the City Council to establish budgets for energy conservation projects had been difficult. In the past, we could have saved hundreds of thousands of dollars if we had the data to show us where energy was being wasted. The Commercial Load Profiler software's forecasting feature provides an excellent way to demonstrate to management how investing in upgrades will affect what we will expect to pay for energy in the future."*

Tim McMahon  
Project Manager,  
Facilities Management Department  
City of Scottsdale



For example, at Scottsdale's Civic Center office building, which is an older building, the lighting controls did not have any system in place to monitor electricity usage. People left the lights on when it was not necessary. As a pilot project, the facilities project manager had lighting controls operated by motion sensors installed on an entire floor. The manager was then able to use the consumption reports provided by the Load Profiler to document a decrease in consumption and justify the initial installation costs, suggesting that motion sensors should be added to additional facilities. Had Scottsdale's project manager not had the 15 minute incremental consumption data available, the small change due to this pilot program could have been brushed over as being insignificant because there would have been little to no definitive way to justify that his efforts indeed had an effect on the bottom line month over month.

Another example of the benefits of reporting occurred at the city's Cactus Park Recreation Center. Historically, all the park lights would come on at the same time of the day, every day, causing the electrical load to spike heavily every evening. Referring to daily consumption data from Load Profiler, the city's project manager was able to work with electricians to identify the problem and work to change the sequence of the lights so that they don't come on all at once, avoiding the spike, and also varying the schedule to be more in line with lighting needs dictated by the seasons.

### Energy consumption data justifies decisions

The information provided by the EIS was also helpful in justifying the decision to change the sequence of operations for the HVAC system in the Scottsdale Civic Center Library. Using the energy consumption data, the Facilities Management Department was able to compare the efficiency of the new sequence with that of the old one over the previous year. When the system's energy usage jumped back up briefly, as shown in a daily load profile report, the facilities manager inquired what was happening, and it turned out that the chiller at the library was switched over to the older machine briefly while service personnel did some work on the new one. Without reports being made available on a daily basis to the end user, the small increase in consumption at month-end might have been a mystery.

Having daily load profile data also helps the City of Scottsdale manage the fees it charges for the use of its rentable facilities. For example, the city owns an event center called Westworld that has meeting rooms that can be rented out by the day. There are five electric meters at the Westworld facility, and the city can use Load Profiler reports to help assign rental costs for use of the facility. And, because the facility's metering is wifi-enabled, city managers can monitor the power consumption in real-time.

"I pulled in over \$100K in energy conservation rebates this year, and the Load Profiler had a lot to do with that," said Tim McMahon, project manager at the Scottsdale Facilities Management Dept. "Every city has limited budgets and the reports available using of the Commercial Load Profiler can show the city council and citizens what their money is being used for."

Scottsdale's experience is not unique in APS' territory. Commercial businesses can benefit from continuous electrical consumption monitoring as well. "We had a customer that used the system and

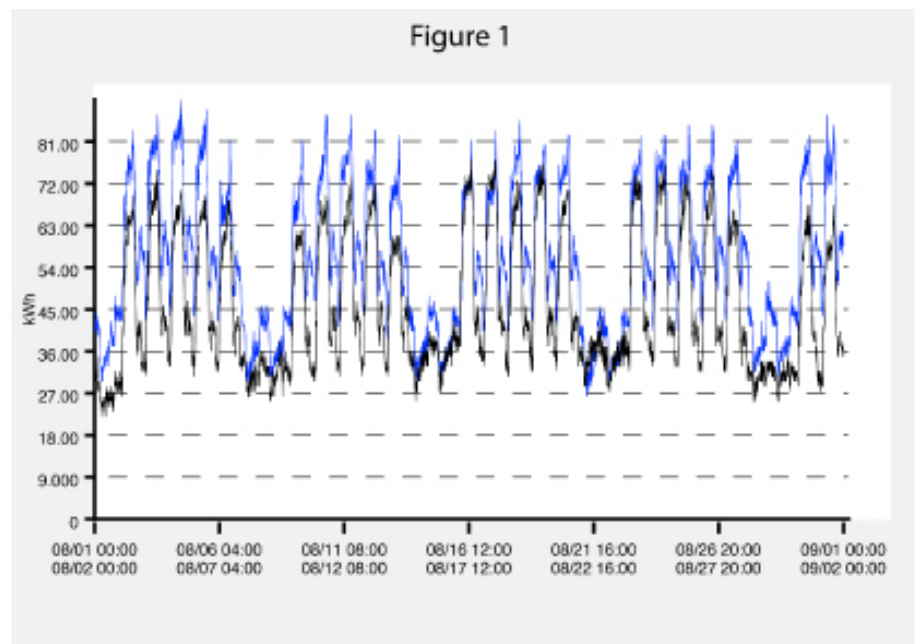


Figure 1 shows energy usage for the North Corporation Building in Scottsdale, AZ for one month (August 2010) represented by the black lines, compared to the same month of the prior year (August 2009), represented by the blue. The total power usage for the month in 2010 reflects a decrease of approximately 16%, showing the net result of setting building thermostats at higher temperatures to save energy.

found that their chiller was cycling very fast which would have decreased the life of the chiller," said Wayne Dobberpuhl of APS. "By discovering this and fixing the problem, the customer not only saved wasted energy, they extended the life of their equipment." APS is actively evangelizing the benefits of using the Commercial Load Profiling service as it has set goals for improving the efficiency of energy usage in its territory.

Automated Energy's Load Profiler system uses graphical reports to show the difference in energy consumption attributable to specific initiatives vs dependent on weather, and can be compiled from data collected at one or more meters over any specified period of time, i.e. month over month of year prior or year over year etc. (See Figure 1). Other meter reading systems simply report power usage by individual meters, and typically don't allow aggregating the data from multiple meters according to different parameters.

### Factor out fluctuations due to weather

The system also provides the ability to factor out the effects of weather-related factors (e.g. outside temperature) on the energy usage data. This is an extremely valuable feature as the reduction or consumption can then be attributed to the correct cause (See Figure 2). The software does this by comparing the current year's temperature patterns to previous years and doing regression analysis to construct a consumption model for a baseline year. These types of calculations are not new to the industry, but by automating the computations and making the results available in customizable, easy-to-use reports, time can be saved for customers who may not otherwise be able to do the analysis.

The Load Profiler's ability to track and document energy rates in addition to kWh consumption came in handy recently when Scottsdale city managers saw that overall energy costs for one year had increased, even though several new energy conservation initiatives were undertaken. The report showed a 35% decrease in consumption, but the rates had gone up. Without taking the conservation steps that it did, the City of Scottsdale would have had to pay significantly more for its energy.

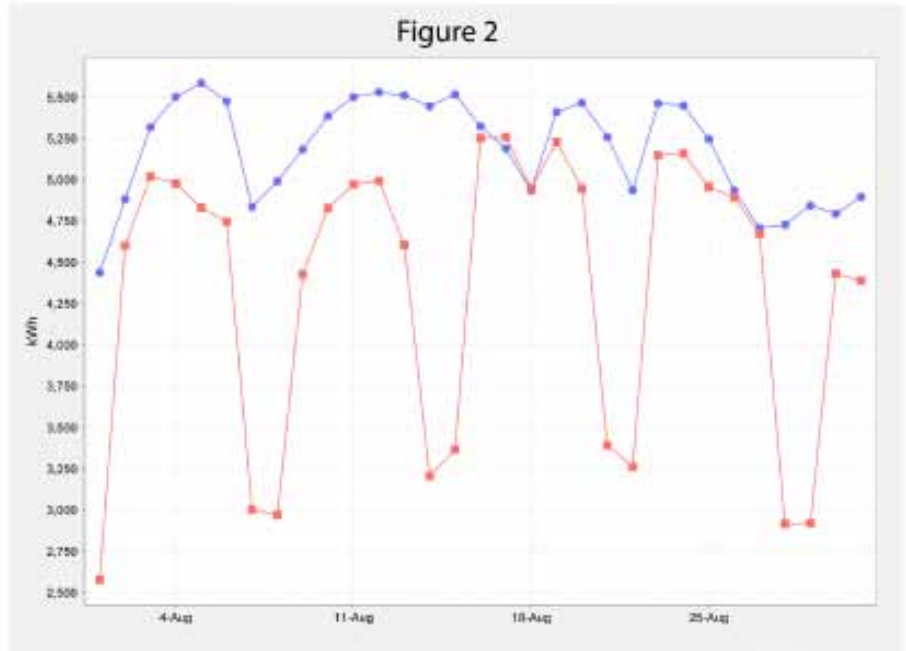


Figure 2 shows that the energy savings were a direct result of behavior changes (red line) and not just cooler temperatures (blue line).

*"I liken this service to a bathroom scale for customers on a diet," said Wayne Dobberpuhl of APS. "When you see a change for the worse, you need to ask the question why and then you will start understanding how your facility operates. You can't do that without a service like this."*

Wayne Dobberpuhl  
Arizona Public Service (APS)



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