



Load Profiler Information Helps Viad Reduce Peak Energy Costs

Built in 1991, the Viad Corporate Center in Phoenix is a 500,000 square foot multi-tenant class A office tower. Its 24 floors and 78 suites house 853 occupants on any given workday. To serve a population as large as a small city, the electric bill was more than \$700,000 for the year 2012. Managing the building's energy consumption, plus dealing with other day-to-day issues on behalf of the owners is Ron Lloyd, Operations Manager with building management firm McCarthy Cook & Co., who went looking to make a change.

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Ron Lloyd, Operations Manager



ONE BUILDING MANAGER REDUCED PEAK DEMAND

How did he do it?

"The peak charges levied by our local utility are a major factor affecting the profitability of our operations," said Lloyd. "The utility looks at our maximum KW demand for the period between May 1 and Oct 1 and the entire year's billing is determined off of that figure." With electrical costs forecasted to rise dramatically in the Phoenix area, Lloyd decided that strong action needed to be taken to bring the building's energy costs under control. With this in mind, the Viad facilities manager embarked on a \$500K+ project that made LED retrofits to existing lighting circuits, installed variable frequency drives (VFDs) to save money in operating the chillers, and replaced the entire high-rise EMS energy management system with new control boards on every electrical circuit.

To measure the effectiveness of specific energy-saving measures, Lloyd knew he needed more detailed and frequent data on how much power the building was consuming than what was shown on the monthly bills that he had been obtaining from his utility, Arizona Public Service (APS), so he spoke with them about ways to get him the information that he needed. And APS had just such a solution and suggested that Lloyd talk with Automated Energy Inc.. "Because they were part of APS' Solutions for Business Program they came highly recommended," said Ron Lloyd. "After calling and researching the firm I was convinced they had the solution I needed."

AEI proposed that Lloyd install power meters on key building circuits, and that he subscribe to AEI's Load Profiler service. Load Profiler is a web-based application that tracks energy consumption on a near-real-time (every 15 minutes) basis. The web app allows subscribers to monitor their consump-



The Viad Corporate Center, Phoenix, Arizona, has more than a half million square feet of multi-use office space.



tion from anywhere via the Internet. To provide the data to be tracked by Load Profiler, Lloyd installed four meters: one to track building-level power consumption another monitors power going to floors 1-13, another to monitor floors 13-26, and a fourth to track energy consumed by the building's HVAC plant. The use of submetering enables Lloyd to isolate areas for improved energy savings and system problems more readily. (See Figure 1.)

Before the energy-saving measures were undertaken, the building was consuming an electrical load well over 2200 KVA, with peaks of 2600-2800 KVA, and the Load Profiler graph showed that power usage in the building was peaking in the early morning on Mondays, as commercial tenants returned from their weekends off and powered up their office equipment and HVAC units to cool the building from its elevated weekend temperature. After the new building control system was put in place, and some changes in building operation were instituted, Lloyd was able to lower peak electrical demand to 1627 KVA. "We did it by starting the building HVAC system at 1AM on Monday morning and cooling the building slowly over the course of several hours. This limited the Monday morning peak and shifted peak demand to 2:30PM in the afternoon to be more in line with response to maximum solar load versus infrastructure startup," said Ron Lloyd. "I wouldn't have been able to do this without using AEI's tool."

The Load Profiler application enables users to compare current consumption with data from the previous year, which can be adjusted to compensate for differences in temperature. The information it provides can be used in concert with the building's energy management system (EMS) to reduce temperature swings in the office spaces and hence reduce energy wasted in oscillations about a target point. "On the typical week, the old EMS would switch between dealing with 'too hot' and 'too cold' conditions approximately 30 times, causing it to switch from cooling to heating and back again," said Ron Lloyd. "Now we switch modes only about three times. We don't have temperature drift, though we do allow the temperature to rise over the weekend." Through smart control management, the new EMS was able to meet all the building's cooling needs last summer with just half of the building's cooling capacity.

Since APS sets Viad's electrical rates for the next year based on the facility's peak demand in the summer of the current year, the effect of the reduction in energy required to maintain a comfortable building climate also keeps the facility's year-long electrical costs as low as possible.

"The cost of the AEI monitoring service is negligible compared to the amount of money we save," said Ron Lloyd.

The Load Profiler data is also useful in planning energy needs of new building tenants. "Contractors here are required to include meter info on their blueprints in their bids on projects," said Ron Lloyd. "Now, rather than having to wait on the local utility to send information, they can just ask me for the histories that are archived on the system." This feature alone offers the contractor the opportunity to get the bidding interior remodeling done in much less time and with a lot less hassle.

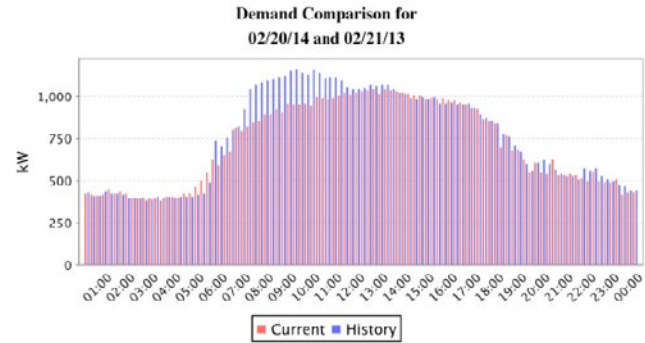


Figure 1. Screen image from Load Profiler showing energy usage at Viad for one day in 2014 compared to the approximate same time period in 2013. As the graph shows, through a smarter control strategy, initiated later in 2013, the EMS was able to reduce peak demand charge and shift the peak to later in the day.

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