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Kilawatt Technologies Lives Up to Its Name

by

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“I have a strength and a weakness,” Paul Grover explains. “My weakness is that I’m not an engineer. My strength is that I’m not an engineer.” He’s got a sense of humor that just won’t quit. What he means is that, without that formal training, he’s able to look at problems from a different angle.

Paul is “the godfather” of infrared thermography, the use of infrared cameras to study heat loss or cold infiltration. In 1977, he started a company that for 20 years developed software, refined practices, and conducted technical trainings in infrared imaging applications.

But for the last six years, as president of Kilawatt Technologies of Shelburne, he’s been developing a service that conserves electricity in large buildings and whole industrial or office complexes.

The distinction between “efficiency” and “conservation” is crucial to Kilawatt’s work: efficiency is deriving more use out of less electricity; conservation is simply not using it.

The main obstacle preventing an organization from saving energy, Paul says, is lack of knowledge of what can be done. That, and lack of money: Most companies, schools, or towns think they need a big up-front cash investment to install energy-saving technologies.

So Paul devised his business to show people what their options are and provide solutions that don’t require big capital investment or require any cash out of pocket. Functionally, you can get Kilawatt’s services for no money.

Paul describes himself as a guy who thinks best in pictures, so he explains what Kilawatt does using images – lovely charts and graphs in pastel greens and aquas, cut by lines of turquoise, pink, black, orange. They visually demonstrate Kilawatt’s guiding principles, “measure, reduce, verify, sustain.”

The process begins with measuring the power consumption of, say, a major corporate building. Paul’s team looks at several years’ worth of electricity bills, inventories equipment, interviews staff, and installs various sensors. Their primary targets are heating, air conditioning, and ventilation (HVAC), along with computers, lighting, and office equipment.

But they’re not just looking at technology. They also study how people work, how appliances are used, seeking opportunities for operational improvements. Sometimes it’s as simple as asking maintenance staff when they turn on lights at night, in preparation for the janitors. If it’s hours before lights will be needed, why not just have the janitors turn on a given light when needed? Better practices and policies can save many kilowatt hours (kWh).

Then there’s rate structure. Utilities have complex rates for big electricity consumers: on-peak, off-peak, seasonal variations, and charges not just for kWh – the total amount of juice consumed over time – but for kilowatts, the amount used at any given moment. Ironically, cutting consumption can sometimes actually raise costs because it can change the customer’s rate category. So Kilawatt’s software juxtaposes usage patterns against rate structure to identify the greatest cost savings.

Proper equipment management is also crucial. In a large building, air is circulated and fresh air brought inside; interior air is heated or cooled dependent on outside temperatures. These electricity-gobbling HVAC systems are automated, turning on at specified times or when the thermostat says to. But they’re usually poorly regulated, so that buildings are over-ventilated, -heated, or -cooled all night, or the AC and heating “fight” with each other due to overlapping settings.

Paul’s graphs show fan cycles and interior temperature fluctuations relative to exterior temperature. Some HVAC components cycle on and off, represented on the chart by high plateaus separated by steep cliffs; some, high straight lines, never turn off, even when the building is unoccupied.

Some zigs and zags on the graphs make sense – heating coming on, say – but many are inexplicable and blatantly wasteful.

“The most sophisticated buildings are often the most screwed up,” Paul says. Their systems are too complex for the typical maintenance person to regulate without additional training, or different spaces’ HVAC

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needs conflict. Kilowatt typically prescribes a range of remedies such as changes in operation, new settings for equipment, or staff training. Only after existing systems have been optimized should a company consider investing in new technology.

Kilowatt's recommendations can result in dramatic savings: Shelburne Community School, for example, saved \$58,222 worth of electricity in two years – with a capital investment of \$75. They didn't even pay an up-front fee to Kilowatt, because that came from a percentage of the savings. This payment formula guarantees good results, because unless Paul's clients save money, he doesn't get paid. Kilowatt seeks a minimum of 15% savings for their clients, but averages around 20%.

Finally, Kilowatt documents emissions reductions of carbon dioxide and other pollutants. To date, by failing to consume 705,172 kWh of electricity, Shelburne Community School has avoided emitting precisely 853,259 pounds of CO².

It's another proof that energy management, not just new generation, is crucial to our energy future, and a demonstration that Kilowatt is aptly named – the bad pun notwithstanding.

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