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## Discover Your Facility's Energy Fingerprint

By **Bill Holmes, P.E.** September 16, 2011 03:23:03 pm[Email](#)[Print](#)[Like](#)

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While I was stationed at Tyndall Air Force Base in Florida, I was working in the yard one evening when my neighbor Byron walked across the street to talk to me. Byron was an Air Force Major and a navigator on a C-54, a World War II era prop plane. After we asked about each other's families and made a little small talk, he mentioned, "I had an interesting day. I crashed into the swamp down by Tampa."

"Oh my God," I said. "Are you okay? You look fine."

"Just a little sore," he replied. "We were really lucky. One guy got bitten by a snake but that was it."

"What happened?"

"We were on the ground on a training mission to McDill. We got refueled, took off, reached about 1,000 feet and all four engines quit at exactly the same time. Dead silence," Byron said. "We knew we were going down. Ed, the pilot did a masterful job of gliding into the swamp with a dead stick. I had to throw away my shorts but other than that, there was no serious damage or injuries."

"Holysmokes!" I said. "What happened? What caused it?"

"We found out that the fuel truck was carrying JP4, jet fuel, which is basically kerosene. The gasoline engines on our plane really didn't like it much," he replied. "We should have been suspicious when one of the crew overheard the refueler say, 'Whether it's a supersonic jet fighter or an old WWII propeller plane, they aren't fundamentally different.'"

But of course, despite having a lot in common, they are very different. So are any two facilities.

### Comparing Energy Use Has Little Value

For some time, I have been reading about the EPA's Energy Star rating system, which is based on comparing one building's energy usage with that of a similar one, whether it be a home, church, school, hospital or industrial plant. This is a huge and, I am sure, very expensive program that apparently many see as an effective way to reduce energy consumption in this country. But, and pardon me for saying so, EPA's Energy Star rating system is based on a flawed concept right from the start.

The basic concept appears to me to be that somehow knowing how much energy your neighbor's house is using has anything at all to do with your house. A lot of people these days seem to be looking for simple solutions to complex problems. Sorry, in my experience it doesn't work that way. Comparing one building against another is not scientifically valid. While detailed comparisons of individual systems using actual monitored data do have merit, comparing an entire facility against another using only utility meter data has very little. Each building needs to be compared against itself.

My Dad worked for the electric company for nearly 40 years. When I first got into the energy conservation business, he told me about dealing with complaints from homeowners about high electric bills for nearly all of those years. Nine times out of 10, the basis for their complaint was that "their neighbor's bill was lower." They wanted him to do something about it; often, to replace their meter. A meter failure was extremely rare – they were 99.99% reliable.

He was a very caring and well liked man who devoted his working life to "his" customers, so I am sure

## Sustainability Infographics



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## Author Bio

**Bill Holmes, P.E.**

**Bill Holmes, P.E.** founded Holmes Energy LLC [www.holmesenergy.com](http://www.holmesenergy.com) and developed the AutoPilot Monitoring-Based Commissioning (MBCx) System in 1979. He has a B.S. and M.S. in mechanical engineering and has done additional coursework and research for his PhD. He is a former Purdue professor and taught for several years in the Continuing Education in Energy Management Program at the University of Wisconsin.

Bill has produced savings from 20% to, in a few projects, more than 50% from low-cost, no-cost changes in management, operation, maintenance and control alone in all types of facilities including Industrial Plants owned by Fortune 500 Companies.

He is the recipient of a DOE Award for Energy Innovation and was the Indiana Energy

he spent many hours patiently explaining to people that their neighbor's house and bill had absolutely nothing to do with theirs. What they needed to focus on was their house, their furnace, their air conditioner, their appliances, and the habits and practices of their family. Had they had the opportunity to watch their meter hour by hour (the basis of the now-bygone Google PowerMeter), they might have been able to track down the causes of their high bills.

### A House: What Could Be Simpler?

Everyone understands a house. But take three identical subdivision homes. One is occupied by a professional couple gone 12 hours a day with their HVAC equipment on a setback thermostat during the day and when they are sleeping at night. The second has a heated swimming pool, a stay-at-home Mom, four kids and a Dad who works from home. The third is a retired couple with a 90-year-old mother living with them. What can you possibly learn by comparing the energy usage of these homes? About the only things that I know for sure you can learn is their usages will be vastly different, and you can't learn much by comparing them.

Even more differences show up in larger buildings. What about comparing a church that is only used on Sunday with one that hosts a full-time nursery school, a day-care center and free community dinners three times a week? Every building is unique and the energy needs of the building are determined by the people, processes, schedules and system designs. Some have a single thermostat, others multiple control zones. Some have steam boilers, others electric heat or geothermal. Some are poorly designed, others are well designed. They are there to meet a need, to serve a purpose, and those are what determine how much energy the building uses.

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Manager of the Year in 1990. He has published numerous papers and been making presentations on his projects and methods for more than 25 years. Bill is a sculptor, a writer and a regular contributor to Sustainable Plant.

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