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Don't Forget about the Systems that Actually Use the Energy

By **Bill Holmes, P.E.** August 24, 2012 02:11:00 pm[Email](#)[Print](#)[Like](#)

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I first became aware of the EPA's Building Energy Competition when I read in the local newspaper that a nearby school in Carbondale, Colorado would be one of the participants. The article said that the students and staff would be heavily involved and incentives would include root-beer floats and pizza parties. I did a little research into the competition and from what I can tell, the main emphasis is on getting the occupants involved with the program and judging results by comparing the Energy Star rating of each facility with those of others around the country. I wanted to know more so I contacted the engineering firm managing the project.

Look at Where the Energy Goes

From what I had read there didn't seem to be much emphasis or attention given to the energy-consuming systems. In a school, what uses the energy? Is it the students? Look at the breakdown of how and where the energy is actually used. The biggest user is the HVAC system – the heating, ventilating and air conditioning system, the boilers, the chillers, the cooling towers. Then the lights, and the computers and office equipment, and the cafeteria. Of course it's important to have the occupants involved, but this is really misleading people. It takes the most important factor, the equipment and systems that actually use the energy, and basically trivializes their importance.

I ask Mike at the engineering firm about the energy systems. How are they involved? Who will be understanding and operating and maintaining them as a part of this project? His answer was that all of the contractors in the building would be provided with data from Energy Star showing how the school compares with others, and the contractors will do what is required to make the improvements. And what is their incentive? And who is going to provide their training? Not training just to make the systems work, hopefully, they already have that; but to make them run most efficiently? That is not a capability that even the best contractors have. It's a different field and a different skill set.

I would love nothing more than to see this project be tremendously successful. I could learn something. But I don't think that's going to happen.

I also asked him how were they going to get feedback, measure performance and savings; what data would be used? Mike said the only source of data was the utility company, the main electric meter, which is what the Energy Star Program uses to compare one building with other similar ones. So after nearly 40 years since the first oil embargo and the beginning of energy conservation efforts in the United States, and more than 20 years since Al Gore invented the Internet that led to an explosion of information tools, wireless communication, smart phones and instant sharing of every type of data imaginable, the best thing a huge and very expensive government program can come up with to evaluate building energy efficiency is to compare the electric meter in one building, a single data point, with the electric meters in others? Too bad those who designed the program didn't understand the most important factors in energy consumption, the role of the actual systems that use the energy and the people who operate and maintain them. Just think of what might have been accomplished had all of those hours and all of those dollars been used to actually save energy.

What about using my approach? Act as though this building, every building is an airplane. Put in instrumentation and use actual data to apply basic engineering problem-solving and management techniques to make good decisions, provide feedback and scientifically verify the savings. Why not? What's the problem? Why do people resist? What do they base their confidence on? I suppose the

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Author Bio

**Bill Holmes, P.E.**

Bill Holmes, P.E. founded Holmes Energy LLC 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

answer is that many of them are inexperienced, idealistic and naïve. They have taken energy auditing courses and been trained by others in their organization who, often with no actual field experience of their own, are just perpetuating what they have been taught. They have the same high hopes as I did on my first project. But do they have to produce documented savings to get a paycheck each month; to feed their family? Maybe they should. Maybe that would help them learn firsthand what is important and what's not, what produces savings and what doesn't. Listen to those who have been there. Like Peter Judd, who was associated with New York City Public Housing: "Inhuman engineering fools itself into thinking something will work when it won't. By contrast, the human side means to design and plan with an understanding of the user and the behavior under actual conditions." (Peter H. Judd, Ph.D., Strategic Planning for Energy and the Environment, Vol. 14, No. 2, Fall 1994)

I would love nothing more than to see this project be tremendously successful. I could learn something. But I don't think that's going to happen. Maybe for a few months or a year, but I imagine that when the competition is over, the people driving it move on, the occupants lose interest, and those operating and maintaining the energy consuming systems return to the old ways, the school will go back to where it was before.

Bill Holmes/EPA National Airplane Competition

But if I am wrong, if this program turns out to be successful, then I propose to co-sponsor the Bill Holmes/EPA National Airplane Competition. Let's get about 14 airplanes in different cities and have them all fly to Carbondale, Colorado for a wonderful weekend of skiing next winter. Each plane can have a cheerleader or an Amway dealer to get all of the passengers really pumped up. They will build their confidence so they will all be absolutely certain beyond any doubt that their plane will make it, beat all of the other planes to Colorado. Don't worry about the engines or the controls or even the pilot; there will be enough shared confidence among the passengers that those things will all take care of themselves. And as they are all eating their pizza and ice cream and singing the airline theme song, maybe they won't notice the crash, explosion and fire. You know, if all of the passengers are motivated, enthusiastic and cheering the plane on, that's really nice but if the engine doesn't work right, all of that doesn't really matter does it?

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