

LEED Barriers to District Energy

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Editor's Note: "LEED + District Energy" is a quarterly column providing information about the U.S. Green Building Council's LEED rating system and how it applies to buildings served by district energy systems.

My oldest son just graduated from high school, thank the Lord! Like me he was a late bloomer when it came to studying. However, it seemed to click before it was too late, and he has managed to get into engineering school. There is something about having children that really makes you appreciate your parents and all they did for you. In fact, I leaned over at his graduation ceremony and gave my mom a big, thankful hug. In her eyes was a little bit of payback satisfaction from seeing me struggle to get my son focused as she had to do for me.

Graduation ceremonies can be long but often have a good speech or two. The valedictorian of his class gave a particularly good one. In the middle of the ninth grade, she had moved from her native country of South Korea to the United States, where she enrolled in my son's high school. Her English was limited to about two dozen words at the time. Yet, in spite of the language and cultural barriers, she managed to achieve the highest grade point average in a graduating class of more than 500!

As she shared her tale, and thanked the many who had helped her along the way, she described the numerous

barriers to success she had to overcome. We all love a good story of an underdog overcoming barriers. As individuals and as an organization in the district energy industry, we face barriers of a different sort. Our challenges include communicating the advantages of district energy to those who could most benefit from its use.

CHALLENGES OLD AND NEW

Many members of our organization are involved in operating, managing, designing and/or selling district energy utilities. We understand inside and out the advantages that district systems can provide to buildings on campuses and in large municipalities. When an event such as Superstorm Sandy highlights the amazing resilience of our systems, we cheer! While standalone building systems often get neglected, we invest in, maintain and continually work to improve our systems' operating efficiencies.

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Yet, in spite of all the advantages of district energy, we have always faced barriers to expanding its use. Today, with customers demanding LEED (Leadership in Energy and Environmental Design) certification of their facilities so they can

demonstrate "greenness" to their stakeholders, we face new barriers along with some of the old.

As IDEA's liaison with the U.S. Green Building Council (USGBC) on the treatment of district energy in its LEED program, I have often been called on by our members who encounter new barriers and need help in overcoming them. In this quarter's column, I want to share the main barriers that I continue to see.

BARRIER NO. 1: BUILDING ENGINEERING DESIGNERS

In general, there is little incentive for traditional HVAC designers to want a facility they are designing to tie into district energy systems. There are several reasons for this that are as old as district energy itself, such as the following:

- Designers know how to put small heating and cooling plants in buildings because that is what they typically have always done on their projects. Tying into district energy often requires them to learn about chilled-water bridges and return-water temperature control. Putting in pressure-reducing stations and heat exchangers for district steam is well outside the comfort zone of designers who work only with hot water boilers. It could increase the complexity of their design.
- Even though district energy design may be more complicated for them, their compensation for it is often less. Designers' fees are normally based on

a percentage of the total construction cost of a building mechanical system. Removing the chilled-water and heating hot water generation systems from the project can significantly reduce the total costs of the mechanical systems and thus reduce their income.

- On any project, a designer must collaborate with multiple people – from the owner’s various teams to the architect, other engineering disciplines, public utilities and code reviewers. District energy operators would be just another name to have to add to that already long list.

While these challenges have been around for a while, there are several new ones inherent in the LEED program. They include the following:

- The LEED program itself is complicated for anyone to understand and apply. In addition, designers are often expected to meet LEED requirements without significant compensation for their efforts. In general, choosing to connect a facility into district energy systems will create significant additional complexity in a LEED application for designers who are preparing them.
- The above-mentioned complexity not only affects designers but also the USGBC reviewers tasked with reviewing LEED applications. These folks also are often far from experts in how to account for district energy use by a building seeking LEED certification. Their unfamiliarity with district energy technology can lead to delayed reviews and additional misplaced comments from reviewers who don’t fully understand how the USGBC’s district energy guidelines were intended to be applied.
- In general, many designers not associated with IDEA do not know the many advantages district energy can provide. Often, they have bought into the idea that district energy systems are old and inefficient.

BARRIER NO. 2: MANUFACTURERS

Equipment manufacturers, some of which are IDEA members, can also be a barrier to district energy. The first reason has always been there: A chiller manufacturer likely has much more profit potential on the sale of 20 100-ton chillers than on

one 2,000-ton chiller. The same applies to sales of boilers, pumps, cooling towers and on down the line. From an economic standpoint, it is easy to understand why there is a lot of motivation for manufacturers to sell a higher volume of small equipment.

The second reason, newer at least in its overall impact, is that published estimated equipment efficiencies on proposed standalone equipment are being compared to real efficiencies in district energy systems. A short visit to Google reveals boilers advertised with 96 percent efficiencies. While a seasoned energy engineer understands that these types of efficiencies are not achievable annually in real life, the LEED program allows designers to use this published data in determining the points achieved from energy efficiency. As such, it is not surprising that LEED-certified buildings have difficulty achieving energy-use levels predicted by their energy models.

BARRIER NO. 3: OURSELVES

Sometimes we can be our own worst enemy. I have seen attitudes toward the USGBC’s LEED program be a barrier to selling district energy. First, district energy owners and operators sometimes want to throw their weight around with the USGBC. “Just go tell them that this is not how they should do it, and that if they don’t change, we won’t be happy.” Wow, really? If the USGBC is the 800-lb gorilla, we could not tip a 5-lb scale by comparison. The USGBC wrestles with organizations such as Big Oil, the natural gas industry, the chemical manufacturers’ industry, the forestry industry, states and the feds. Do you really think threats from us carry any weight?

Also, folks often misunderstand what the USGBC cares about. Henry Ford once said, “If there is any one secret of success, it lies in the ability to get the other person’s point of view and see things from that person’s angle as well as your own.” Ford must have said it because he recognized most people fail in this area. The USGBC does not care about the traditional benefits of district energy that we market. “Resilient ... so what?!?” What it cares about is impact on the environment, period. In other words, how much energy

is consumed to generate and deliver our utilities and what negative impacts to the environment occur during that process. Many systems have innovative technologies, such as renewable fuels, combined heat and power, and thermal storage. Some do not. The ones that do not will have difficulty when LEED certification is required for a customer’s building.

The biggest barrier is not understanding how your system affects a customer’s LEED application. Knowing the benefits of your system and being able to communicate and sell those benefits to existing and potential customers are essential to success. Do you know where your system stands in a customer’s LEED application? Do you understand the benefits and drawbacks?

BE AN OVERCOMER

Just like the valedictorian at my son’s graduation, we all face barriers in life, including in our work. We inherently understand the potential district energy has to help solve the environmental issues our world faces. However, we will have to continue to overcome barriers in order to be successful in the future. In this column, I just talked about the barriers themselves. My goal, however, has always been to equip our members to overcome them. Look for more of that in the future! 🌀



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