

# District Energy Guidance Documents: A look at what's new

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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.

Understanding the U.S. Green Building Council's LEED® (Leadership in Energy and Environmental Design) rating system has never been easy. Trying to apply the rating system to district energy exponentially increases the confusion. Addressing this, the USGBC created a work group, under the supervision of its Energy and Atmosphere Technical Advisory Group, to develop a guidance document to assist designers in incorporating district energy in LEED applications. In early 2008, this work group completed and released to the public its first District Energy Guidance Document, titled "Required Treatment of District Thermal Energy in LEED-NC version 2.2 and LEED for Schools, Version 1.0." Even then, however, the USGBC recognized that this guidance document was very much a work in progress. As the technology industry has taught us, if you wait to release a software product – or product update – until all the bugs are worked out, the market's need for that

software will have passed you by. Recognizing this principal, the USGBC released the district energy guidance document quickly, understanding that guidance was needed right away. The opportunity to improve and refine the guidance would be an ongoing process.

So in January 2009, the work group began meeting again with the goal of releasing not one but two new guidance documents. (I have had the privilege of participating in this work group over the past year while representing IDEA and its members' interests.) The first new guidance document will be titled "Required Treatment of District Energy in LEED 2009, Version 1.0." The second will be an update of the original "Required Treatment of District Thermal Energy in LEED-NC version 2.2 and LEED for Schools, Version 1.0." In addition, the group also began work on a new document, which will be the first version of a guideline designed for district energy customer buildings pursuing certification under the LEED for Existing Buildings rating system rather than under LEED for New Construction (LEED-NC) standards.

Finally, in late October 2009, the two new guidelines were presented to the Energy and Atmosphere Technical Advisory

Group for approval should be released by the time this column is published. To get a copy, contact IDEA, (508) 366-9339, [idea@districtenergy.org](mailto:idea@districtenergy.org), or visit [www.districtenergy.org/LEED](http://www.districtenergy.org/LEED).

## Version 2.0 – New and Improved

Version 2.0 of the district energy guidance document pertaining to new construction will have many improvements over the original rating system. Here are highlights of some of the proposed changes:

### Thermal Energy Storage

Thermal energy storage (TES) systems use more energy than non-TES systems but can have an overall net positive effect on the environment. As a result, the USGBC did not discourage TES in the original version, but it did not address TES in district energy systems.

For instance, the original LEED guidelines required a building modeler to use the building's electric rate structure in energy models of buildings with on-site chilled-water generation, as well as in models of buildings receiving chilled water from a district system. Therefore, a building project could earn points for utilizing TES within the building site by taking advantage of a preferred TES electric rate structure, but TES generated in a district plan would be penalized because it is required to use the building's traditional rate structure.

As a result, one of IDEA's goals was to modify these guidelines to recognize the benefits of TES in district energy applications. Through information provided by our organization, the USGBC work group recognized the environmental benefits TES provides, as well as the economies of scale that result from including TES with district energy. This change has been accomplished, as the new guidelines include specific TES provisions aimed at accounting for the positive benefits of TES in district plant applications.

### Combined Heat and Power

The original district energy system guideline did not address combined heat and power but relied on a separate and often confusing CHP-specific guideline that was not focused on district energy. Similar to the treatment given TES in the

original document, this separate CHP guideline really focused on accounting for CHP within a building itself and not in a district energy application. Just as it did on the topic of TES, IDEA provided data to the work group on CHP, which aided the group's understanding of the positive environmental impacts associated with CHP in district applications. As a result, CHP guidelines specific to district energy have been added to the latest guidance document version.

These CHP-related guidelines include default efficiency numbers, similar to previously included chilled-water, steam and distribution defaults, allowing designers to model CHP when data is not available. As with other defaults, however, the numbers are purposely set at unattractive levels, i.e., 22 percent electric generation efficiency and 25 percent thermal generation efficiency. The intent is to encourage CHP owners to determine their actual system energy efficiency instead of using defaults.

### Energy Rates

One of the biggest obstacles that the original guideline created for district energy was the requirement to overcome the minimum energy prerequisite, better known as Step 1 of the energy model. Within Step 1, both the proposed and baseline building had to use the actual chilled-water, steam or heating hot water rate being charged to the building. Since this is a 'burdened' rate – meaning it includes not only energy costs, but operation and maintenance costs, debt retirement, profit, etc. – this inflated the percentage of the building's total energy use associated with these utilities compared to other uses such as lighting, fan energy, etc.

Although it would take a full column to explain the details of this issue (and we will cover it in a future column), for now it's enough to know that this created often insurmountable hurdles for building projects tying into district energy. In an attempt to address this issue, the new guideline includes formulas designed to convert the fully burdened rate into an actual rate, thus reducing the percentage associated with this utility.

Confused? I'll explain in a future column. However, trust me: It is good news for district energy.

The addition of these formulas

answers another primary concern for district energy owners – the confidentiality of their financial data. Now realistic energy rates can be used in models without district energy owners having to reveal all of this information.

### Absorption Chillers

The new guidelines also include provisions for modeling absorption chillers in district energy applications in both the baseline and proposed building. Default efficiencies for absorption cooling are also included for use when actual data is not available.

### Renewable Energy

The USGBC has always intended to encourage the use of what they consider to be renewable energy in district energy plants, although their definition of "renewable" is fairly narrowly defined. However, the original guideline's formula for determining applicable credit contained an error that basically made it impossible to achieve any credit. Through much discussion, the IDEA team was able to bring the error to light, and it has now been fixed in the new guideline.

### Commissioning

The first guideline's requirements for commissioning have been further clarified in the latest version, with provisions added to address plant expansions. In addition, the requirements have been modified slightly to align better with LEED for Existing Buildings requirements.

### Step 1 Points


The first guideline required a Step 2 energy simulation model be completed before a building could earn any points beyond those required under the minimum energy prerequisite. The new guideline allows up to four points under Step 1. This means a project can achieve up to four points under the energy efficiency credit (EA Credit 1) without having to include the impact of the district energy systems.

### Leveling the Field

Although at the time of this writing none of these changes is official, when the new guideline is released it will contain many improvements that will help put

district energy on a level playing field under the USGBC's LEED rating system. As an organization, we have made significant progress toward this goal, but we have more work to do. Over the next year, IDEA will continue to work with the USGBC to monitor progress, provide input and encourage the development of guidelines that capture the real benefit district energy can provide. In the next issue, I will let you know if any of the above-mentioned changes were removed from the final guideline by the Technical Advisory Group and I will dive into some practical modeling issues associated with district energy.

One of the unintended consequences of the 'improvements' to the district energy guidance document is an increased level of complexity. Unfortunately, the document has almost doubled in length. In addition, if you think the first version was difficult to understand, hang on...you have not seen anything yet!

In this, however, there lies an opportunity for IDEA. Throughout the review process, IDEA has been working on a 'guidance to the guidance' document to help explain in simple language how to apply the district energy system guidance document. This document will give our organization's members a tool with which to educate building owners, design engineers and ourselves on how to apply the benefits of district energy under the LEED program. More on this later. 

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