

Energy Issues

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IEP Newsletter –

IEP Partnering for On-Line PEM Offering

For the past two years IEP has been working closely with a well-known major corporation in the electrical/energy arena to offer the *Professional Energy Manager* certification as part of their on-line *Energy University*.

As you can imagine there were a number of both technical and contractual issues that had to be worked out. Among the most important was the IEP requirement that anyone taking the PEM exam had to complete the same core modules (topics) as offered in the IEP/NCSU three-week *Energy Management*.

Since then both sides have been working on developing and reviewing on-line offerings to



PEM to be offered On-Line

assure compliance with the curriculum. In addition, new exams were developed, with a focus on a more international clientele.

Work on the modules is nearing completion. The on-line offering is schedule to be beta tested this summer. If all goes well a formal announcement of the PEM on-line offering throughout North America will be made during the third quarter of this year. Future plans call for the offering to be expanded into other languages and made available in Europe, South America and other locations.

Tips from the Board

Focus on Lighting Renovations

Following are three (3) recommendations to assure a cost-effective approach to saving energy in lighting systems. Assuming the fixtures are in good condition.....

1. Assure that luminaires are being appropriately controlled. If not, implement strategies to control fixtures.

2. Consider ways of improving fixture performance; i.e., more efficient lamps, ballasts, improved maintenance, etc.
3. Once the first two items have been addressed, look at alternative fixtures with more efficient sources.

Contributor: Thomas D. "Dan" Mull

Evaluating Lighting Proposals

By: Thomas D. Mull, PE, PEM CEM, CLEP

Over the past 35 plus years I've had the opportunity to review a number of vendor proposals for clients. Of the various types of "energy savings" proposals I've examined, lighting is the area where the most inaccuracies seem to occur.

Following are three (3) major issues that tend to appear in numerous lighting proposals; the impact of which is generally inflated savings projections. It is important that anyone considering a lighting renovation become familiar with these items. It should be mentioned that not all lighting vendors employ the approaches that follow, but many do.

1. Average Cost per Kilowatt-hour (kWh) Approach – Most lighting proposals use an average cost per kilowatt-hour in their energy savings calculations. The reason for this is simple. Sales personnel do not understand electric utility rates.

The concept of an average cost per kWh is easily understood. They simply take the annual electrical bill for a facility and divide it by the total kWh consumed during the year. While this approach is reasonable for budgeting purposes, it is not appropriate for accurately projecting savings. Each energy savings measure must be evaluated using the specifics of the applicable rate schedule.

Quite often proposals are made utilizing software programs that only allow an average cost value, which includes both demand and energy. It provides uniformity in their (vendor) presentations, but not necessarily accurate estimates of savings. For example, an initiative

involving lighting controls may not result in peak demand savings. Therefore, the use of an average cost per kWh value would result in inflated savings.

When an average cost is used, the vendor should be asked to provide detailed savings calculations based upon the applicable rate schedule, noting specific savings for demand (where applicable) and energy.

2. Air Conditioning Savings – For lighting proposals that involve air conditioned spaces, vendors have a tendency to include savings associated with the reduced air conditioning requirement resulting from the lighting load (kW) reduction. While it is true that reducing the lighting load in a building should result in a lower space cooling energy requirement, it is nowhere near the 20%+ (of the lighting kW reduction) often included in saving estimates.

To accurately calculate *if* space cooling savings are going to be available the following questions must be answered and their impact included in the analysis.

- a) How much lighting load (kW) will be removed? And for how long (hours/year)?
- b) What is the type of space cooling equipment; chilled water or DX?
- c) What is the efficiency (SEER, EER, kW/ton) of the space cooling equipment?
- d) What is the typical cooling season (hours of annual operation)?

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Lighting Renovation

Vendors also have a tendency to overlook the fact that if a lighting initiative reduces the cooling load, the lost heat must be offset during the heating season with additional energy. Therefore, the following additional questions should be asked:

- a) What is the heating fuel source?
- b) What is the seasonal efficiency of the equipment?
- c) What is the duration of the heating season (hours per year)?
- d) What is the total additional heating requirement?
- e) What is the cost of the heating energy source?

Unless this information has been included in the analysis, any savings associated with air conditioning reductions should be discounted.

3. Maintenance Savings – More than half of the lighting proposals I've reviewed included maintenance savings. While it is true that new equipment should result in reduced maintenance expenses, there are two (2) significant points to consider: *How are the savings calculated?* and *What happens when savings occur?*

- a) How are savings calculated? – Most analyses include an unsubstantiated annual value based upon the first year's projected savings.

To accurately project maintenance related savings hard data on current lighting maintenance expenses is required. Most facilities do not have this level of detailed information available.

- b) *What happens when savings occur?* – As previously noted, when a major lighting renovation occurs there should be maintenance savings. However, the savings should be weighted on the front end, with most of the savings occurring in the first year or two. After that the savings should trend to a lower norm.

Facilities managers may, however, disagree that there will be savings at all. Assume the case of internal maintenance personnel. If they are not replacing lamps and ballasts the argument is made that they would be doing something else. Therefore, maintenance savings would only be realized if someone was laid off.

In the case of contract maintenance personnel a stronger case can be made for savings, if the total number of hours paid for maintenance is reduced. However, to justify this hard data (time spent on lighting maintenance) would be required.

When included in a proposal, it is always best to ask the vendor for the basis on which maintenance savings were calculated. The validity of the assumptions can then be determined.

In summary, accurate projections of energy and dollar savings are essential to justifying and prioritizing initiatives. In addition, program credibility depends upon our being able to provide realistic estimates of savings for recommended initiatives. When reviewing any vendor proposal we should thoroughly examine the basis for projected savings and not accept "canned" answers.



Lighting Maintenance

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*Of all the “new energies”
he discussed, Yergin says
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efficiency. It is the most
important of all.”*

PEM

Professional Energy Manager

THE QUEST - ENERGY, SECURITY, AND THE REMAKING OF THE MODERN WORLD

By Daniel Yergin

A Book Review by William H. Mashburn, PE, PEM

The Penguin Press, 793 pages, \$37.95

Daniel Yergin is one of the most influential voices on energy in the world and a highly respected authority on international politics and economics. In this book he gives an unbiased account of the many facets of energy. It is a story that spans the energies on which our civilization has been built and the new energies that are competing to replace them.

He documents the drama of oil – the struggle for access, the battle for control, the insecurity of supply and how it continues to profoundly affect our world. He lists the new sources that are constantly being discovered, and discusses the often poised question - *Is the world running out of oil?* Yergin continues with the natural gas revolution and the issues associated with fracking.

The “electric age” is discussed from Edison and the decision for alternating current to fuel choices of the future. Climate and carbon topics from glacial changes to international conferences that have been held are discussed, along with the continued search for consensus.

The portion of the book on the history of renewable energy covers the early failures, their rebirth and the relatively minor impact they have on electrical requirements. A discussion of the electric car leads into the question - *Where does the additional electric power come from?*

Of all the “new energies” he discusses, Yergin says the “fifth wheel” is *efficiency*. It has the most potential of all. Also, he points out the deficiency of trained personnel in this field.

This is a very long book, but so well written it reads more like a novel than a documentary on energy. Once into it, one is compelled to complete it. For a broader and more complete understanding of the energy issues facing us now and in the future, I strongly recommend this book for Professional Energy Managers.

This book can be purchased from Amazon.com at a discounted price.

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