



Book Review Editor: Theodore J. Weidner, Ph.D., P.E., CEFP, AIA

Many references for facility managers are expensive, and

with the constant trimming of budgets occurring today, recommending an essential reference when there's no money obviously isn't helpful. This edition contains two references available at no cost via download from their respective sites. Both look in the code and standards realm, an area of significant interest.

NATIONAL COST-EFFECTIVENESS OF ANSI/ASHRAE/IES STANDARD 90.1-2013

Pacific Northwest National Laboratory, Richland, WA, 2015, 123 pp., download, \$0.

Whenever a code or standard is updated, the first thing large facility owners need to do is figure out how the changes affect the cost of ownership. The typical result is that the cost will go up. That has been a relatively consistent result over the 30-plus years of my career, as code has continued to address the increasing sophistication of facilities and the attempt to eliminate various risks.

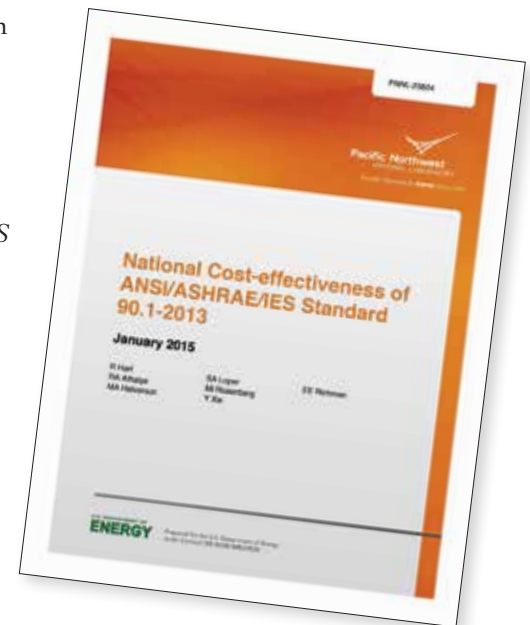
The adoption of international codes, as reflected in the International Code Council (ICC) family of documents, has made things simultaneously easier and more difficult. About ten years ago the many building codes used across the country were generally reduced to the ICC documents, so those of us moving from one region to another didn't have to learn a new set of codes. But keeping up with changes in codes and standards has remained difficult, which is why APPA created the APPA Standards and Codes Council (ASCC). The regular calendar of changes rotating through the ICC family follows a three-year revision cycle, and vigilance and expertise rotate with each cycle.

Fortunately for everyone, the Pacific Northwest National Laboratory (PNNL), via a contract from the U.S. Department of Energy, undertook an

analysis of the changes in ASHRAE Standard 90.1, titled *National Cost-Effectiveness of the ANSI/ASHRAE/IES Standard 90.1-2013*. Both the Illuminating Engineering Society (IES) and ASHRAE are standards development organizations recognized by ANSI, the American National Standards Institute, which is the American link to the International Code Council, the unified source of building codes in the United States. Energy efficiency of heating, ventilating, and air conditioning (HVAC) systems in buildings has been an area of attention for ASHRAE for years.

Although there are many more buildings and climate types affected by the 90.1 changes, PNNL selected six building types and five climate locations. The sample represents nearly 75 percent of new construction by floor area, a reasonable sample size. The building types are a good representation of higher education space types, but the analysis is not perfect, because, for example, athletic facilities are not analyzed specifically. As in any good study, however, the analysis methods are clear, the results are easily understood, and the assumptions are well documented, so that the remaining building types and climate locations can be analyzed by owners as needed, without significant deviations in methodology.

While not the focus of this review, the study results are favorable and demonstrate that the added cost in facilities



generates immediate and reasonable payback in most cases.

The analysis looks at 33 of the 110 changes to ASHRAE 90.1 from the code's 2010 version, providing a brief description of each. To examine the other 77 changes, one must use the references provided. Each of the models analyzed are described in detail in the appendix, including references for each assumption such as design dimensions and costs. There's enough information so a competent person can perform a parallel analysis for other elements not included.

Although the new standards are not without cost, the analysis of cost benefits is. This detailed reference is not for everyone, but a staff engineer or sustainability officer will want to look at PNNL's analysis to address questions about changes to ASHRAE 90.1 and develop additional ways to save energy and costs.

STANDARDIZATION ROADMAP: ENERGY EFFICIENCY IN THE BUILDING ENVIRONMENT

Energy Efficiency Standardization Coordination Collaborative of the American National Standards Institute, 2014, ANSI, 226 pp., download, \$0.

One of the many challenges facing facility managers is the changing landscape of external issues affecting facilities. The Montreal Protocols of 1987 compelled changes to the use of refrigerants, and in 1990 APPA created a way for facility officers to make intelligent and economical decisions in response. Other changes in standards, codes, laws, or best practices have resulted in additional efforts to assist facility managers.

Energy efficiency presents several challenges for everyone, not just facility managers. As I often say, this is a sweet spot for facility managers, because the CFO will cut a lot of other costs in order to pay the utility bill. So if a facility manager makes a clear link between physical projects and utility savings, additional funding may result.

Due to the size and complexity of the issue, the American National Standards Institute initiated discussions among 168 experts from over 60 organizations, corporations, and institutions. The discussions focused on five major areas of energy efficiency looking at standards, system integration, ratings systems, measurement and verification, and credentials. The result is *Standardization Roadmap: Energy Efficiency in the Built Environment*, a report that outlines 125 specific areas requiring development of standards and common terminology and proposes three different time frames to address these areas—within two years, within five years, and beyond five years. To keep the report a manageable size and within the realm of facility officers' interest and control, individual product standards, generation, and distribution were not included.

There are a number of issues identified in this document of interest to education facility officers. Because APPA is attempting to take a leadership role in this area, this is an excellent and timely document to obtain.

Of first importance are the overall codes and standards development issues. The document assigns most of the energy assessment and performance standards duties to



ASHRAE. Most of these codes and standards address what could be called the “last mile” of energy efficiency—energy efficiency behind the meter. Many institutions have developed tools and techniques to address these issues, but many others have not. Likewise, institutions have focused on certified in-house expertise via hiring or education, but certificates have varying levels of education and rigor, so there are concerns for consistency and focused improvements.

The gaps identified in the document mean that an organized approach to energy efficiency will progress slowly. While a slow approach may be satisfactory in many other areas, the financial benefits available—when there are so many other financial pressures on education institutions—suggest we need to speed up the process. Slow progress

wastes money. There is clear evidence for this in the wide range of energy consumption outcomes in education institutions: Some institutions continue to consume a lot of energy, while others are much more energy efficient, and thus economical.

One result not addressed in the document, is a way that will allow CFOs to link operating to capital expenditures. This TCO (total cost of ownership) approach can increase the speed at which improvements are made and energy saved. Unfortunately, the only recognized tool available now is an energy service company (ESCO), which carries some baggage for institutions concerned with outsourcing, trust, and debt burden, to name a few.

Overall, the *Roadmap* is good and looks at many of the right things. The conclusions about current technology and gaps may be food for thought for some and obvious to others. The clear message I get from *Roadmap* is that APPA and its members need to embrace the commitment to cost savings available from efficiency improvements.

There are many wise and influential members who can assist with the items identified in this report. Many of these items dovetail with existing efforts of the ASCC and the facilities performance indicators. If you haven't previously joined in APPA's efforts to address energy, sustainability, and cost issues, now is the time. Get this free document and step up your game. ☺

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