



THE CODE WORD IS *PEOPLE*

The author argues for an energy code that is focused more on humans than numbers

BY GREG GUARNACCIA

The ASHRAE/IESNA 90.1 Energy Code has been the subject of a great deal of attention recently. Five of the first seven *LD+A* issues this year have “Energy Advisor” articles, among others, discussing the 90.1 code, and the May issue has a very compelling “President’s Perspective” article from former IES president Fred Oberkircher discussing how the IES must be more involved in shaping regulations.

Our industry is going through an amazing period of growth in product technology, the science of lighting and energy sensitivity. Any one of these elements could be enough to distract us from what’s important, but together with the global eye on energy and climate issues, it feels like a perfect storm—a storm that has the potential to knock us off course from focusing on the single most important aspect of lighting, *people*.

Lighting is designed, engineered, installed and operated for people. This will never change. Whether it’s for critical tasks in a healthcare facility or decorative façade lighting enhancing a sense of community, it stands to reason that how we, human beings, respond to light is the most important factor to consider. If lighting fails to meet the needs of its users, it’s a waste of energy no matter how efficient the luminaires and how low the watts per square ft. The point of saving energy and being a good custodian of the environment is to sustain healthy and productive *people*.

While I doubt that there is much, if any, disagreement over the im-

portance of human factors, it’s nonetheless easy to get distracted. With the passing of 90.1-2010 we see the progressive tightening of the energy belt primarily in the form of lower lighting power density (LPD) limits. There is a growing consensus among practitioners that we are at, or even past, the limit of what can be achieved with current technology and its associated economics while still creating “quality lighting” under these strict wattage limits.

No matter how you define “quality lighting,” it must always include human needs as a primary factor. Human needs encompass a myriad of physiological and psychological elements that can range from visual acuity and cognitive response to mood and emotional response. This, in turn, affects everything from office productivity to retail sales. If we are so concerned with health, happiness and productivity, why do so many seem to ignore this? Part of the issue is education. It is incumbent upon those of us in the industry to educate others and speak out before we find the practice of lighting design reduced to formulaic applications motivated by watts per sq ft. It’s also paramount that organizations such as the IES make a greater effort to reach policy makers and the public in an effort to effect positive change.

I was recently lucky enough to be a part of a number of e-mail discussions with a member of the ASHRAE 90.1 committee that culminated in two face-to-face discussions at the most recent LIGHTFAIR convention. This peek behind the

wizard’s curtain was illuminating. It was obvious that the committee is aware of these issues *and* that the revision process is lengthy, with many interests involved.

Change can carry a financial cost, as well. Regardless of what may be the reasons for resisting or delaying these necessary changes to the 90.1 code, the question to ask is: what is the cost to *people* in terms of health, happiness and productivity if we continue down the same path?

DESIGNING A CODE

We will always need some form of energy code, and that presents our industry with two big questions to answer. The first is, how can we make the 90.1 code direct greater efficiency while abating LPD reductions?

On the front end, we should allow lighting practitioners a little discretion in applying their expertise through a modest allowance of additional wattage per sq ft based on specific justifiable criteria supported by the programming of the facility. (This would be in addition to the somewhat problematic exemption that applies to spaces used by occupants with special lighting needs, such as a retirement home.) This discretion should apply to the typical tasks being performed in a space. For example, a specific type of laboratory may require higher light levels than another. This flexibility in design is important since accommodating human needs is not necessarily a quantifiable element.

There must also be some accommodation for controls. Auto-

matic controls are quickly becoming mandated. Turning a light off is the best form of efficiency, yet this has not abated dropping LPD levels. Additionally, complex controls, such as building management systems with sophisticated options like demand response or daylight harvesting, are sometimes installed for various reasons. The use of these systems should achieve some kind of additional LPD allowance as well. Finally, it's important to recognize that lighting is not the only energy-consuming process even though it seems as if it's always in the crosshairs. All energy-consuming equipment must share the burden and play a hand in stricter efficiency standards so no single one is saddled with the bulk of the belt tightening.

One of the big challenges is whether or not the 90.1 code should require some level of post-completion compliance. I don't think that we can achieve our goals of effective efficiency without this. For example, every building should post some kind of energy report based on actual usage, updated annually, in an appropriate public area. People living and working in these buildings should be aware of how much energy their building or facility uses, and where it stands in relation to similar facilities. Knowledge is power, and if occupants and owners know how they compare, it's easier for them to be part of the solution. Public awareness is also a powerful motivator to put a good foot forward in being as efficient as possible. This type of report can be tied into requir-

ing buildings to be registered with the Energy Star Portfolio Manager. This gives owners and building managers great tools to assess performance and find ways to be more efficient and save money.

Commissioning is another concept to implement. Commissioning is the best way to ensure systems are running correctly and at peak efficiency. A modest level of required commissioning can go a long way.

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Take that a step further and require periodic recommissioning to make sure systems are still performing years down the road. While most of these ideas are not truly quantifiable in terms of calculating the specific effect they will have on actual energy use, not everything must fit into a formula to be an effective addition to the 90.1 code. The goal being, with the addition of various tactics there is no reason we can't limit the decline of LPDs while still increasing efficiency.

WHEN LEED BECOMES LAW

The second question revolves around the impact of voluntary criteria that are applied to increase efficiency beyond the 90.1 code. The 90.1 Energy Code is supposed to be a reasonably strict minimum compliance standard for the entire market taking into consideration the current state of technology,

economics and design practices. If the consensus is that 90.1 has become more than a minimum standard, then what happens when voluntary initiatives such as LEED and other green building systems become law?

LEED and other green programs have done a tremendous job in raising awareness and providing an actionable plan for greater efficiency. But LEED and most other

rating programs were never meant to become law. They are designed as voluntary programs for a market-leading percentage of buildings as opposed to a market-wide, baseline mandate.

This has not stopped municipalities from mandating minimum levels of LEED certification or the equivalent. In Baltimore, all covered buildings must achieve a LEED Silver rating or energy and environmental design standards that the building official identifies as equivalent to a Silver-level rating in the appropriate LEED rating system. Washington, D.C. requires various levels of LEED certification and by 2012 will require a performance bond to guarantee compliance.

These cities are not unique, and this trend puts the 90.1 code in the awkward position of being intrinsically tied to a green building

ESSAY

system that is more regularly updated and is done so by a private organization with goals that might not always be in sync with the 90.1 code, making for quite the moving target. If practitioners are finding it difficult to meet the 90.1 standard and still create quality and affordable lighting, it can easily be exacerbated by these green regulations. Too many projects start with the following: "We need you to achieve x percentage reduction in LPDs so we can achieve these LEED points." We shouldn't be starting a project with a calculator. Design must follow a qualitative approach by first responding to the occupants and their needs.

Unfortunately, not every client is willing to hear this or pay the premium sometimes required for the equipment to meet these energy requirements and still provide the necessary light levels. Something ends up having to give a little. Often that something is appropriate illuminance levels and ratios. Part of the solution is to keep the 90.1 code in the position of a baseline mandate with simple and reasonable criteria. It's something that requires the 90.1 code to take a more holistic approach to efficiency rather than just the continuous decline of LPD levels and more complex calculations.

WE CAN'T AFFORD TO WAIT

These questions are surely too complex to answer fully in this article, but they can at least help us rediscover the proper direction in which to be moving. We will never be able to fully quan-

tify quality lighting in charts and calculations. Some consideration must be given to the expertise of the practitioner to recognize the needs of occupants. We must also find other tactics such as commissioning and space type refinement to increase efficiency so as not to rely on the continuous decline of LPDs. Hopefully, we as an industry can effect positive change and the policy-making powers that be will recognize the urgency of the issue. As we wait for a better 90.1 code to be developed, the wattage restrictions get tighter and we continue to build out facilities under these regulations that will take years to develop and see the results (arguably too late and too expensive to fix after the fact). In the end, it's *people* who lose out. ☘



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