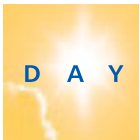


# enlighten

THE BIMONTHLY NEWSLETTER OF THE DAYLIGHTING COLLABORATIVE

[www.daylighting.org](http://www.daylighting.org)

volume 1, issue 5 • august 2008



DAYLIGHTING  
collaborative®

Thank you to the Sponsors who support the Daylighting Collaborative's mission of **lighting every building using the sky:**

#### PLATINUM

We Energies

#### GOLD

Draper, Inc.

Leviton

Sensor Switch

WattStopper/Legrand

#### SILVER

Carlisle SynTec

HUVCO Daylighting Solutions

Kalwall Corporation

Lighting Analysts, Inc.

LightLouver LLC

Major Industries, Inc.

Solatube International, Inc.

Sunoptics Prismatic Skylights

#### BRONZE

Alliant Energy

Cooper Controls

DayStar Daylighting Systems

DUO-GARD Industries, Inc.

Madison Gas & Electric

Pella Windows & Doors Verhalen, Inc.

Xcel Energy

## DAYLIGHTING METRICS—Defining Successful Daylighting

For over a decade, daylighting has been recognized as a key strategy to reducing building energy use. Yet very few buildings have a comprehensive daylighting strategy that saves energy. Why not? Most designers answer that they do not have a clear definition of what successful daylighting is or performance goals their designs must achieve. Metrics would provide a path to defining effective daylighting and move us closer to realizing its potential energy savings and related environmental benefits.

So what would daylighting metrics incorporate? How **do** we know if a space is effectively daylit? What are the critical factors to consider?

Generally, a daylit project means that the space receives primary illumination from natural light. But what does this mean? Is the entry way that's constructed of glass letting all 8,000 footcandles of outside light shine in a properly daylit space? Is the classroom with low-transmittance glazing that allows 20 percent of the light in a daylit space? Is the space with abundant natural light but with all the electric lights on also a daylit space? Is daylighting qualitative or quantitative? Is daylighting a success only when it results in using less electric lighting energy?

At a minimum, daylighting metrics must consider the following:

**AVAILABILITY OF SUFFICIENT DAYLIGHT:** There are minimum requirements for illumination within a space depending on occupancy, special tasks/needs and local codes. A daylit space should rely on natural light as the primary light source during daytime hours. This metric would determine if sufficient daylight is available to allow reduced use or no use of electric lighting. If sufficient daylight is available to provide adequate illumination, the space would qualify as daylit.

**QUALITY OF VISUAL ENVIRONMENT:** This is the subjective component of daylighting design and the most difficult to assess with a single metric. This metric must consider the most significant issues regarding quality of lighting: glare and veiling reflections. Glare results when contrasts within the visual field are too

*continued on page 2*

## DID YOU KNOW...

Excerpted from *"Windows for High-Performance Buildings"* by John Carmody, Stephen Selkowitz, Eleanor Lee, Dariush Arasteh and Todd Willmert:

"Commercial buildings account for 16 percent of all US energy consumption (15.4 quadrillion Btus out of a total of 92.6 Quads). Windows are responsible for 1.1 Quads of energy for heating and cooling commercial buildings, while lighting accounts for 3.83 Quads. If it is assumed that 25 percent of lighting energy use could be affected by daylighting (about 0.96 Quads), then windows in commercial buildings account for about 2 Quads total per year or over 2 percent of the total national energy consumption."

When given numbers such as these, daylighting quickly rises to the top of the list for energy savings strategies. Daylighting offers a huge potential for reduced energy use in buildings and the associated environmental benefit of reduction of greenhouse gases.

## NEW SPONSOR

**The Daylighting Collaborative welcomes a new sponsor:**

**Carlisle SynTec** manufactures roofing systems and materials.

*continued from page 1*—**DAYLIGHTING METRICS**

great for the eye to adapt to comfortably. Veiling reflections result in the inability to see details due to reduced contrast. The difficulty in developing this metric is the fact that different tasks require different illumination levels.

**ENERGY IMPACTS:** Daylighting strategies should be considered a failure if there is no attempt or an unsuccessful attempt to turn off or reduce electric light use when natural light is available. This metric should be tied to the energy impacts on whole building energy use to determine whether the daylighting is a performance benefit or a design amenity. This metric must consider both energy use reduction (kWh) as well as demand reduction (kW).

Metrics incorporating the above elements would not define design strategies but performance goals for successful daylighting. Performance goals allow for variation in design approaches necessitated by various climates, regions, building types, etc. Once these metrics have been established, they will most likely be incorporated into LEED™ and other green building rating systems. The metrics will be used to determine points awarded for daylighting, replacing the existing Glazing Factor and Daylight Factor which have been difficult for design teams to effectively design to and calculate.

Not only will these metrics be included in green building rating systems, they will help move daylighting towards standard design practice. Metrics may also help move daylighting into building codes across the country in the future (some states, including California already have code language for daylighting design).

There currently are two efforts underway to develop daylighting metrics. The Daylight Metrics subcommittee of the Illuminating Engineering Society of North America (IESNA) is working with researchers funded by a California PIER (Public Interest Energy Research) grant to identify metrics that "define" appropriate and effective daylighting. The California Daylighting PIER project objective states:

*"...to develop a set of daylight performance metrics and criteria, in cooperation with national and international leaders in the field, which can be used by programs, codes and standards to promote successfully daylight buildings, and thus greater energy savings and demand reduction. This project will address both energy performance and illuminations standards for buildings."*

[www.h-m-g.com/DaylightPlus/Daylight\\_Metrics.htm](http://www.h-m-g.com/DaylightPlus/Daylight_Metrics.htm)

A parallel effort is being funded by the New York State Energy and Research Development Authority (NYSERDA). The metrics being developed by these efforts are focused on end-design evaluation of a project.

Can a metric developed for evaluation purposes help the design team? Yes, because it sets the playing field goals. A metric that defines appropriate daylighting performance can help cut across the communication divide between the various com-

*continued on page 3*

## Training Update

Featured at Greenbuild 2008...

### Lighting and Daylighting Design with Energy Efficiency

This USGBC LEED workshop, presented by the Daylighting Collaborative, is for all audiences interested in daylighting design considerations that incorporate new technologies and strategies to achieve sustainable building goals.

When: Tuesday, November 18, 2008  
8:30am–5:00pm

More information can be found at <http://www.greenbuildexpo.org>

### eQUEST Building Energy Simulation

**eQUEST: Introduction to Schematic Design** Learn how to use computer modeling to predict the energy performance of buildings, perform whole-building energy analysis using Building Creation Wizards and analyze design alternatives at a schematic level.

**eQUEST: Introduction to Detailed Design** Learn how to execute energy modeling efficiently and effectively, utilize detailed design applications beyond the schematic level and customize applications to do complex HVAC and lighting systems models.

Register for eQUEST and many more programs through Energy Center University, the Daylighting Collaborative's professional education training partner at <http://www.ecw.org/university>

*continued from page 2*—DAYLIGHTING METRICS

ponents of the design team. While the metric is not intended as a design tool, it should help to inform the design community regarding the critical elements of successful daylighting design. It will ensure that designers are all considering the same elements regarding their strategy for incorporating natural light into their designs.

We will provide updates on the progress of these efforts as new information is available. ■

## TECHNOLOGY AND RESEARCH UPDATE

### SURVEY PROVIDES INSIGHTS ON CURRENT PRACTICE

What are the current daylighting design practices among design teams with an explicit interest in sustainable design? A survey was undertaken by researchers at the Institute for Research in Construction in Canada: (1) to understand which daylight performance indicators and design tools are currently used by design practitioners to integrate daylighting in their projects; (2) to identify the additional information needed beyond that available in current design guides; and (3) to advise on the content and format of a new daylighting design guide that addresses these needs. Download "Current Daylighting Design Practice: A Survey" from <http://irc.nrc-cnrc.gc.ca/pubs/fulltext/nrcc49460/> ■

## ONLINE

### WEST BEND MUTUAL INSURANCE COMPANY

See the West Bend Mutual Insurance Company's integrated design team in action in a virtual case study from the Energy Center of Wisconsin. Go to [www.ecw.org/wbmi](http://www.ecw.org/wbmi) for details!

This team, comprised of staff from West Bend Mutual Insurance Company, Plunkett Raysich Architects, Ring & DuChateau and C.G. Schmidt, successfully completed a 214,000 square foot addition to West Bend Mutual Insurance Company's corporate headquarters. They preserved the natural beauty of the 160-acre restored prairie building site, maintained continuity with the original building and employed energy efficiency strategies, including daylighting, resulting in more than \$58,000 in annual savings.

### WHAT'S NEW ON THE WEBSITE?

We need your help! To provide new information, we depend on inquiries from those who use the site! If you need to know something, please let us know. We currently are developing our calendar for adding new content. Let us know what's important for you to know. [info@daylighting.org](mailto:info@daylighting.org)

**Sponsor the Daylighting Collaborative...**and connect with the design and construction professionals who need your products and services to deliver sustainable, energy efficient, carbon neutral buildings. **For more information** about sponsorship opportunities, contact Peggy Heisch at [pheisch@ecw.org](mailto:pheisch@ecw.org) or 608.238.8276 x139.