



Lighting Mock-ups Make Brilliant Cents
By Stephanie Enlow

Why should you invest time and money into doing a mock-up at the Lighting Design Lab? Studies prove that commercial spaces are improved by the installation of quality lighting systems. Are you planning to remodel a space in preparation for leasing? Invest some money into the lighting systems-with little paint and a planned lighting retrofit; watch how quickly the space gets leased. John

Speirs, of KG Investments said, "Without a doubt, good lighting quality creates an atmosphere that has a positive influence on leasing space. You cannot get a better return on your investment than with energy upgrades and they are easy to sell to owners and tenants. It's more than simple payback."

How are complex lighting solutions or technologies conveyed a to an owner? There are many tools available to the lighting professional, but to the layman the interpretation of these studies is like trying to read a foreign language. Computer renderings provide some additional insight, but they require special software to generate with no guarantees that it will portray the actual constructed design correctly. Sketches convey preliminary concepts well, but cannot convey the idea without some artistic license, which may not be accurate.

Seeing is believing. I have had many opportunities in my career to do mock-ups and they have provided valuable information that saved the owner money in time and material. A design team may take several lighting systems and compare them in a simulated space and make changes to design without causing the owner additional charges by delaying the construction of a project.

The Lab offers this service to anyone who is making decisions about commercial lighting systems. The Lighting Design Lab has operated throughout the Pacific Northwest since 1989. It is sponsored by the Northwest Energy Efficiency Alliance, and is part of the BetterBricks system. The Lab's mission is to transform the Northwest lighting market by promoting quality design and energy efficient technologies. The Lab accomplishes this mission through education and training, consultations, technical assistance, and by providing mock-ups of commercial lighting systems. With its twenty-five by forty-foot mock-up room with adjustable 20 foot high ceiling, the Lighting Design Lab has modeled everything from classrooms to retail spaces, offices, and hospitals rooms.

As part of the mission, the Lab donates eight hours of labor, and three days of viewing time. If additional time is required charges are incurred only for the time and materials. Specialists are on staff to help your design team plan the most cost and time efficient mock-up. This service can be provided to the lighting community at such an economical rate because of the support it receives from our local power companies through the Northwest Energy Efficiency Alliance.

Photos and examples of mockups done over the past years are available on the projects' website/ For more information on the Lighting Design Lab's mock-up services visit www.lightingdesignlab.com.

make cents.

News



Above: The Evergreen Medical Center corridor uses color changing lighting to add visual interest in an ordinarily pedestrian space. Ms Enlow conducted several mockups at the LDL as part of the development of the design. Photo courtesy Sparling Electrical Engineering.

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what's new in lighting?

by Michael Lane LC



Above:

20W Constant Color (ceramic metal halide) PAR lamps from GE. Photo courtesy GE Lighting.

Regularly Scheduled Lighting and Sustainable Design Conferences and Trade Shows

Lightfair 2005

April 10 - 14, 2005
New York City
www.lightfair.com

IESNA Centennial Conference

January 8 - 11, 2006
New York City
www.iesna.org

IESNA Street and Area Lighting Conference

October 2 - 8, 2005
San Diego, CA
www.iesna.org

Greenbuild

November 9 - 11, 2005
Atlanta, GA
www.usgbc.org

LDL Open House

December 14, 2005
Seattle, WA
www.lightingdesignlab.com

Another year has passed and the lighting industry has changed. Lightfair held its 15th annual trade show and conference in Las Vegas.

This year Lightfair added the "Daylighting Institute", a 2-day, 14 seminar focus on daylighting along with the "Lighting Institute" providing masters level lighting education.

One of the annual favorites at Lightfair is the New Product Showcase. There were over 220 products in five major categories were showcased; 1) Interior Luminaires; 2) Exterior

Luminaires; 3) Specialty Luminaires; 4) Lamps; 5) Ballasts, Controls, Components and Specialty Products.

The IESNA held its national conference in Tampa, FL. There will not be an annual conference in 2005, because in 2006 the conference will be moved from its normal summer schedule to January to coincide with the 100th Anniversary of the founding of the IESNA.

The IESNA annual conference is primarily an educational event with multitrack seminars and technical paper presentations. It is also the time that the 60+ committees (from Aviation Lighting to Theater, TV & Film) meet to continue the development of lighting recommendations and standards. The Progress Report featured at the annual conference showcased 138 new products, publications, services and trends in the lighting industry.

I will not try to talk about all of the 358 new products—I'm more interested in the trends of the lighting industry.

Trends in lighting

Efficient electronic ballasts emerged this year promising over 5% energy reduction with instant start and almost 10% energy reduction with program start ballasts while providing the same light as standard electronic ballasts.

Shown below are ballasts from Advance (Optanium), GE (UltraMax), Osram/Sylvania (QHE) & Universal (ULTim8). Of primary interest is the Optanium PS ballast which has virtually erased the energy penalty of using program start ballasts

• **LED products** captured four of the six New Product Showcase special awards. Including; Best New Product of the Year - *io* lighting's LINE - an exterior LED based linear luminaire for applications where "light pollution" and "light trespass" are an issue in facade lighting. Energy Award - Enlux Lighting new LED floodlight that generates equivalent light of a 60W incandescent flood, while utilizing one-third of power and offering longer life. Judges Citation Award - Traxon USA's Mood Light Objects line includes four decorative illumination accent color-changing objects. Roeder Award - Element Labs' Versa™TILE a glowing LED light tile controlled by video signals.

• **T5HO** luminaires keep pushing the limits of design and functionality with products like the Paragon Enterprises Pyramid 34 Rinkmaster a 10-lamp "high-bay" luminaire or the Finelite Series 15 indirect luminaire for low ceiling applications that can have only a 3 inch pendant (and still do a good job of lighting).

• **On the energy code front**, the Department of Energy required states as of July to certify that they have an energy code as stringent as ASHRAE/IESNA 90.1-1999 per EPACT requirements. The updated ASHRAE/IESNA Standard 90.1-2004 was published with new lighting power density requirements for both interior and exterior applications. Note that many states are already requiring or are looking at these new 90.1-2004 requirements.

A joint project between ASHRAE, AIA, IESNA, NBI & DOE was completed on one year for a Advanced Energy Design Guide for Small Office Buildings. Helping designers achieve a 30% total building energy savings over the ASHRAE/IESNA Standard 90.1-1999.

Finally, a thank you should go out to the 5 lighting manufacturers (Acuity Brands Lighting, Lutron, Osram/Sylvania, Philips and Watt Stopper) that had booths at GreenBuild. Whether you like it or not sustainability is here to stay. The lighting industry will need to adapt quickly to the demands of the design community for sustainable lighting products. The lighting industry should also not be afraid to push back on those designers to demand that sustainable buildings be both energy efficient and have good quality lighting (both electric and daylighting), because unfortunately many of the LEED Certified buildings do not.

Comparisons of new generation of ballasts

		Standard ballasts		Optanium		UltraMax		QHE		ULTim8		
		Watts	BF	Watts	BF	Watts	BF	Watts	BF	Watts	BF	
2	F32T8	50	0.77	48	0.78	48	0.77	48	0.78	47	0.77	IS
2	F32T8	58	0.88	55	0.88	54	0.87	55	0.88	54	0.87	IS
2	F32T8	77	1.16			74	1.15					IS
2	F32T8			47	0.71							PS
2	F32T8	62	0.88	56	0.88							PS

tips for lighting big spaces.

by Randal Smith



Above: The shipping area and warehouse of a publishing company in Oregon. Glare control, uniformity, vertical luminance, and efficiency are all components of lighting big spaces. Courtesy Greg Hansen LC, Balzhiser & Hubbard Engineers.

Recently, we offered a class called “Lighting for Big Spaces”, and it turned out to be one of our most popular classes in years. It was not a surprise—this is a topic we have always gotten a lot of questions about. There is not anything fundamentally different about lighting big spaces, but some of the qualities of big rooms make designing the lighting trickier than usual.

Big spaces are often thought of as industrial or warehouses, but increasingly they include big box retail, and multipurpose rooms and gymnasiums in schools. Traditionally, these ‘industrial’ spaces have gotten short shrift on lighting quality, but the new big spaces require much more attention be paid to good lighting.

Lighting Issues of special concern

• Glare

High ceilings in big spaces are often illuminated with high brightness fixtures. Excessive brightness makes working and shopping a challenge.

• Uniformity

Improper lighting distribution creates a lot of work for the eye, causing strained, tired eyes.

• Vertical brightness

People assess the brightness of spaces through the amount of light on ceilings and walls. Dark vertical surfaces make big spaces seem like uninviting caves.

• Maintenance Costs

Many big spaces operate 24/7 and have very high ceilings. Long burn hours make

for more frequent relamping. High ceilings mean that costly lifts are needed to change the lights. Every trip up the lift may cost more than the lamps and energy. Lighting maintenance that is deferred makes the space look neglected and ‘broken’.

• Energy Efficiency

The intensity of light decreases as a function of the square of the distance. This means that a light that is mounted twice as high is one-fourth as bright. So lights mounted high in big spaces must produce lots of lumens to make the space feel well lit. To produce those lumens, it is advisable to use light sources with high lumens/W ratings. Big spaces are regulated by energy

codes too, increasing the challenge of lighting them effectively.

Lighting Options For Big Spaces

• More diffuse lighting

Using luminaires that are more diffused than just point sources can help reduce unpleasant glare in big spaces. This means that when practical, fluorescent luminaires might be selected instead of HID as a tool for reducing glare.

• Uniformity

Pay close attention to the manufacturer’s spacing to mounting criteria of each luminaire. Properly spaced luminaires can evenly light spaces, reducing the amount of work the eye has to do to adjust. High contrast ratios may be nice for displays, but do not help much for working, general shopping, and schools.

• Distribution and reflectivity

Luminaires may be placed so that more light is on walls and warehouse stacks. Fixtures can be selected to provide some uplight. But the surfaces need to have lighter color values in order to reflect the light in the space. Sometimes the ‘lighting’ solutions lie in painting, not relamping.

• Lamp Life and Lumen Depreciation

More light sources are on the market with longer life ratings. Many fluorescent and HID sources last longer than 20,000 hours, especially on longer burn cycles. Induction light sources can operate for an entire working career—100,000 hours. Lamp lumen depreciation, which used to be 30% or more now can be less than 10%. Longer life and less depreciation mean that you get lots more light over the product life.

• Energy Efficiency

Many energy codes allow a Watt or less per square foot in big spaces. So a ceiling filled with 1000W luminaires does not always comply anymore. New pulse start metal halide lamping options improve efficiency for HID. T5HO and T8 fluorescent lamps have revolutionized lighting and efficiency for low-bay applications. When good lighting distribution provides better uniformity, the eye does not need high footcandle levels to see well.

Daylight is a huge tool for improving the efficiency of lighting in big spaces. Skylights and clerestories bring in light during daylight hours. Daylight improves the color, aids in productivity, and integrates well with controls for effective load shedding.

Visual acuity is important nearly everywhere, especially in big spaces where working and shopping happen. Improving visual acuity comes from better lighting distribution and better color. Major advances in color from light sources have improved the lighting in big spaces across the board.

Lighting for Better Color in Big Spaces

• Ceramic Metal Halide

Once CMH was limited exclusively to lower wattage lamps, but this is changing. Higher wattage lamps needed for bigger spaces are becoming available. The CMH lamps offer Color Rendering Index ratings in the ‘80s, transforming dreary warehouses and retail spaces into vibrant, interesting spaces.

• Rare Earth Fluorescent

The old halophosphor days of the Cool White and Warm White lamps are gone, largely done in by the Energy Policy Act of 1992. Today’s Rare Earth (RE) phosphors have ushered in more efficient fluorescent lamps with tremendously better color.

Standard T8s offer CRIs in the ‘70s, but the ‘80 series lamps provide both better color and more lumens. All T5 and T5HO lamps offer CRIs in the ‘80s and high lumens per Watt. Most energy efficient sources offer better color while improving efficiency.

Today’s lighting technology, when combined with intelligent and sensitive design practices mean that our big boxes no longer have to be bland boxes.

winter 2005

events.

Registration on Page 6

did you know?

Members of professional design organizations (AIA, NCQLP/LC, ALA, BOC, and others) may be able to receive continuing education credits for attending events offered by the LDL.

To self-certify your credits (sometimes called learning units) make sure you keep the Certificate of Completion that we distribute at each event.

Learning unit credits are almost always issued at a rate equal to the contact hours. So a 3 hour class would be worth 3 credits.

For information about how your organization works with continuing education credits visit their website at:

AIA

aia.org

ALA

americanlightingassoc.com

ASID

asid.org

BOC

neec.net/boc.htm

BOMA

boma.org

IFMA

ifma.org

IIDA

iida.com

NCQLP

ncqlp.org



BETTERBRICKS

All Registration **must be in advance**. All fees must be **paid in advance**. No registrations or fees will be accepted at the door. On-line registration is available at <http://www.lightingdesignlab.com/classes>

1 • Secrets of Hospitality Lighting. \$30

Billings:	Tuesday, Jan 18	• 1:00pm - 4:00pm
Missoula:	Thursday, Jan 20	• 1:00pm - 4:00pm
Portland:	Monday, Feb 7	• 2:00pm - 5:00pm
Eugene:	Tuesday, Feb 8	• 2:00pm - 5:00pm
Spokane:	Wednesday, Feb 9	• 2:00pm - 5:00pm
Boise:	Wednesday, Feb 16	• 2:00pm - 5:00pm
Seattle:	Wednesday, Feb 23	• 2:00pm - 5:00pm

Lighting for hospitality applications has a heavy emphasis on aesthetics while still needing to address many of the operational concerns of any other commercial space. There is a desire for an inviting atmosphere and high visual impact, but issues of wayfinding, retail transactions, customer service must not be compromised. This class will give the participants tools to juggle the needs of atmosphere, visual tasks, and sustainability concerns brought up by this challenging but exciting environment.



(3 CEU contact hours)

2 • Prescriptions for Lighting Medical Clinics. \$30

Eugene:	Tuesday, March 8	• 2:00pm - 5:00pm
Portland:	Wednesday, March 9	• 2:00pm - 5:00pm
Billings:	Monday, March 21	• 1:00pm - 4:00pm
Missoula:	Thursday, March 24	• 1:00pm - 4:00pm
Boise:	Wednesday, April 20	• 2:00pm - 5:00pm
Seattle:	Wednesday, April 20	• 2:00pm - 5:00pm
Spokane:	Thursday, Apr 28	• 2:00pm - 5:00pm

Throughout the Pacific Northwest we find a number of medical and dental clinics under construction or renovation. This class will focus on design for the types of spaces we typically find in the projects including; exam rooms, lobbies, laboratories, outpatient operatories, and common spaces. We will examine lighting choices that will maximize patient comfort and usability while minimizing energy consumption. Techniques discussed may be easily applied to larger hospital projects.



(3 CEU contact hours)

• Project Design Reviews. no charge by appointment.

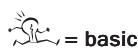
The lighting specialist is available to provide schematic design review of proposed lighting strategies on your commercial and industrial lighting projects. Please contact the specialist for your territory to directly set up an appointment in your office.

3 • Product Knowledge Day — Lamps and Ballasts. no charge.

Seattle:	March 15, 2005	4:00pm – 5:00pm
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High-performance T8s, standard T8s, energy saving T8s, T5 and T5HO? Lamp choices have become more and more confusing. What about the new "Energy Saving" electronic ballasts versus standard electronic ballasts, and let's not forget dimming ballasts? Learn what the manufacturers have to offer and what choices you should consider. Manufacturers will be available for short presentation and tabletop display.

(1 CEU contact hours)



= basic



= intermediate



= expert

4 • GZ Brown — Sun, Wind and Light no charge.

As part of a promoting a more integrated design approach, the LDL will be hosting a series of on sustainable design.
Seattle: Tuesday, Jan 18 • 11:30am - 1:00pm

G. Z. Brown, Professor of Architecture and Director of the Energy Studies in Buildings Laboratory, has been a faculty member of the University of Oregon since 1977, teaching Architectural Design, Environmental Control Systems, and Climate Analysis. A daylighting course has been taught at the University of Oregon since it was developed by Brown in 1980. Brown has provided daylighting and other energy design assistance for architects, engineers, and building owners for 14 million square feet of buildings and has completed over \$14 million in externally funded research. He has developed and conducted workshops on how to design energy-efficient buildings and communities internationally as well as throughout the United States. He won the National Award for Energy Innovation. He is author and coauthor of *InsideOut: Design Procedures for Passive Environmental Technologies* (2nd edition, 1992), and *Sun, Wind and Light: Architectural Design Strategies* (2nd edition, 2001). He also coauthored *Energy Scheming 3.0, software for energy analysis at the schematic stage of the design process*. He has authored or coauthored over 100 technical papers and reports. Brown holds graduate degrees in Industrial Design, Business, and Architecture.



• Lighting Fundamentals Tour - Explore the Lighting Design Lab. no charge by appointment.

In addition to being a work and meeting place, the Lighting Design Lab is designed to be a large walking classroom for teaching the fundamentals of lighting. All the pieces of lighting are on display: light sources; luminaires, controls; and daylighting. Touring the LDL is the perfect way to attend this class and get hands-on exposure to new technology. A Fundamentals Tour lasts about an hour and a half—more if there are lots of questions. If your tour group has a particular interest such as glare, power quality issues, or controls, the tour can be tailored to your interests. A comprehensive tour of the LDL addresses energy effective lighting, integrating daylight and electric light using controls, color characteristics of light, lamps and ballasts, luminaires and more. In addition, the tour provides more details into LDL services.

To schedule a Lighting Fundamentals Tour you may:

- call 800-354-3864 (206-325-9711) ext 29 and set it up with Randy
- email at randy@lightingdesignlab.com or info@lightingdesignlab.com
- fax your request to 206-329-9532



We will need to know what date(s) you would like for the tour, and possible times. It would work best if the tours start no later than 2:00 PM. Please limit your tour group size to 20. Let us know if you have a specific area of interest.

Idl class locations:

Billings:	Prudential Floberg Realtors 1550 Poly Drive Billings MT	Portland:	Univ. of Oregon Portland Center Portland Room #102 722 SW 2nd Ave Portland, OR
Boise:	Idaho Power 1221 W Idaho St Boise ID	Seattle:	Lighting Design Lab 400 E Pine St Suite 100 Seattle WA
Eugene:	EWEB Community Room 500 E 4th Ave Eugene OR	Spokane:	WSU Spokane Phase I Classroom Bldg 668 N Riverpoint Blvd Spokane WA
Missoula:	January 20 - Univ. of Montana Continuing Education Todd Building Room 203 Missoula MT		
	March 24 - Class Location TBA		

registration form.

Winter 2005 Classes

PAYMENT POLICY: Fees Must Be Paid In Advance before attending class. Purchase Orders, checks, and credit cards are accepted. Complete and fax this form to 206-329-9532. Class fees are waived for university students and employees of sponsoring electric Utilities. **No Payment or Registration Will Be Accepted At The Door.**

Secure On-line registration is available at <http://www.lightingdesignlab.com/classes>

registration fee paid by (circle one)

credit card • enclosed check • purchase order • Utility employee fee waiver • university student fee waiver

registration information.

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Company • _____

Profession • _____

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billing information. (must be complete to process card transactions)

Phone • _____ Fax • _____

E-Mail • _____

Address • _____

City, State, Zip • _____

Credit Card Number (VISA & MasterCard ONLY) • Please include your CVV Code - last 3 digits of the number on the back of your card near your signature

Expiration Date • _____

please check the circles of the class(es) and event(s) you wish to attend (on-line registration available).
event locations on page 5.

1 • Hospitality Lighting. \$30

- Billings: Tues 1/18 • 1:00pm - 4:00pm
- Missoula: Thurs 1/20 • 1:00pm - 4:00pm
- Portland: Mon 2/7 • 2:00pm - 5:00pm
- Eugene: Tues 2/8 • 2:00pm - 5:00pm
- Spokane: Wed 2/9 • 2:00pm - 5:00pm
- Boise: Wed 2/16 • 2:00pm - 5:00pm
- Seattle: Wed 2/23 • 2:00pm - 5:00pm

2 • Medical Clinics. \$30

- Eugene: Tue 3/8 • 2:00pm - 5:00pm
- Portland: Wed 3/9 • 2:00pm - 5:00pm
- Billings: Mon 3/21 • 1:00pm - 4:00pm
- Missoula: Thurs 3/24 • 1:00pm - 4:00pm
- Boise: Wed 4/20 • 2:00pm - 5:00pm
- Seattle: Wed 4/20 • 2:00pm - 5:00pm
- Spokane: Thurs 4/28 • 2:00pm - 5:00pm

3 • Product Knowledge Day. no charge.

- Seattle: Tues 3/15 • 4:00pm - 5:00pm

4 • Sun, Wind & Light. no charge.

- Seattle: Tues 1/18 • 11:00am - 1:00pm

You can register instantly and securely on-line. Payment is accepted by credit card, check and purchase order.
www.lightingdesignlab.com/classes

buying fluorescent lamps.

by Randal Smith



Image courtesy Philips Lighting

Few things are less thrilling than shopping for light bulbs (aka lamps). But today some less-than-scrupulous companies are selling fluorescent lamps using less than completely forthright claims. Here are some facts to keep in mind when you are faced with a hard sell for fluorescent lamps. Most of these tips are from the ANSI standards for fluorescent lamps.

• **Rated Life**

Unlike incandescent lamps, which burn out based on the amount of time they are operated, fluorescent lamps are rated based on

how frequently they are started. The more frequently a fluorescent lamp is started, the more quickly it will wear out. In order to standardize life ratings, all fluorescent lamps are supposed to be rated on the “3-hour burn”. This means that the fluorescent lamp is run for 3 hours, turn off for a few minutes, then restarted. So, the life rating of 20,000 hours on a typical fluorescent lamp is based on it being on at least, but no more than 3 hours every time it is started.

If a fluorescent lamp is started less frequently than 3 hours, it should last longer, or less long if started more frequently. But the 3 hour burn is the standard for testing fluorescent lamp life. Beware when pitched a fluorescent lamp that lasts many times longer than the standard — they are probably basing the claims on much longer burns than 3 hours. Ask for the fine print.

A fluorescent lamp that is rated at 20,000 hours on the standard testing time of 3 hours has a reasonable expectation of lasting over 30,000 hours on a 24 hour testing cycle. So, when you hear claims of super-duper lamps lasting nearly 40,000 hours, demand to know the details of the testing cycle of these lamps.

• **Guaranteed Hours**

The life rating of an electric lamp is **never** a guarantee the lamp will operate for that amount of time. When a lamp is rated for 20,000 hours (or any other time period) it means that of a large statistical sample of that product, 50% of the lamps **will be burned** out at that time. It does NOT mean that the lamps are guaranteed to last that long. Many lamp manufacturers offer very good warranties on their lamps, but they can not guarantee that your lamp will still be running at 19,999 hours. You should be skeptical of “guarantees” of lamp life.

• **“Free Replacements”**

We heard of a sales gimmick on a seemingly magic lamp that cost \$18 that normally sells for \$2. If the lamp burns out early, you get a “free” replacement that you have to install yourself. Let’s see — most of the cost of relamping is in the labor, not in the cost of the lamp. With a markup of 900%, there seems to be nothing free about it since you paid the cost of 9 lamps and only get 2 lamps. Paying \$16 more is not free.

Caveat emptor—let the buyer beware. Arm yourself with information to guard against the hard sell.

lighting odds and ends.

by Randal Smith

• **Lighting Research Center**

Reports from the National Lighting Product Information Program (www.lrc.rpi.edu)

Light Sources and Color

Parking Lot and Area Luminaires

Daylighting Dividends Case Study:

Smith Middle School

• **Advanced Buildings**

Joint effort of the New Buildings Institute, the Energy Center of Wisconsin and many others (www.poweryourdesign.com)

High Performance Building Class Calendar

Sourcebooks and Guides

Benchmarks

• **Implement—Seattle’s Sustainable**

Building Tool (www2.ci.seattle.wa.us/Implementation)

A practical guide to designing sustainable buildings. Offers design toolbox and a best practices guide.

• **LightNow**

(www.lightsearch.com/lightnow/) A Regular email newsletter that is produced in conjunction with Lightsearch and the Lighting Controls Association. Provides a timely update of products, programs and economic forecast.

• **California Lighting Technology Center**

(cltc.ucdavis.edu/cltc/) The mission of the CLTC is to foster the application of energy-efficient lighting by facilitating technology demonstrations, development, outreach and educational activities, in partnership with the lighting industry, lighting professionals, and the electric utility community.

• **Energy Ideas Clearinghouse Calendar**

(www.energyideas.org/) The most comprehensive and timely listing of energy training events for our region. Calendar events can be sorted by date, type and topic. You can add your own events quickly and easily.



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Tacoma Power
British Columbia Hydro
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State of Alaska

BetterBricks is a nonprofit initiative of the Northwest Energy Efficiency Alliance. Our free service connects commercial building professionals with the information, tools, training and consultation needed to design and construct high performance buildings. To learn more about our services, call 1.888.216.5357 or visit our website at BetterBricks.com.

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