An Energy Efficiency Workshop & Exposition

Palm Springs, California

WHAT THEY REFUSED TO TELL YOU RULES OF THUMB II

DON JUHASZ MEME/CEM

State Energy Manager

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What they refused to tell you RULES OF THUMB II

- **MYTHS OF ENERGY SAVINGS**
- **ELECTRICAL RULES**
- **HVAC RULES**
- **ECO's RANGES**
- **DISCUSSION/QUESTIONS**

What they refused to tell you
RULES OF THUMB II

MYTHS OF ENERGY SAVINGS

- I am not paying the bill so it really does not matter how much I use.
- It takes more energy to reheat a building than to just leave it at a constant temperature
- It costs more to turn lights off and on than to just leave them on.
- Computers will wear out faster if turned on and off. Plus, updates only occur after hours.
- Refrigerating Batteries will lengthen their live.

What they refused to tell you
RULES OF THUMB II

"Consumer Reports" said in its December 1999 issue "refrigeration, we've found, only slightly extends shelf life". The real concern is heat. Heat will shorten the life of battery. Simply store alkaline batteries at normal room temperature. Rayovac.

"Energizer recommends storing batteries in a cool dry place. Normal room temperature of 70-72 degrees Fahrenheit.
The concern with batteries is that high heat and high humidity will shorten shelf life. The recommendation is to keep batteries in a low humidity environment at room temperature." Energizer

What they refused to tell you
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ELECTRICAL

- T-12 to T-8 conversions-reduce one bulb per fixture if existing light levels are adequate. NLT-2 bulbs / fixture except in hallways.
- Compact fluorescent conversions from incandescent -use a 3 or 4 to 1 wattage ratio. I.E. 120W = 40W CF.
- Government subsidizes vending machines.

What they refused to tell you
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ELECTRICAL Continued

- Circulation pumps very seldom need to run 24 hr / day.
- Refrigerators (used for storage) cost more to operate than any benefit received by increase in battery or film life.
- Controlling Outside Lighting is one of the highest percentage payback items.

What they refused to tell you
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HVAC

- 1% SAVINGS PER°F SET POINT ADJUSTMENT FOR EACH 8 HOURS HEATING
- 2% SAVINGS PER°F SET POINT ADJUSTMENT FOR EACH 8 HOURS COOLING
- Air Handlers very seldom need to run 24 hours a day, 7 days a week.
- Failing to change the air conditioning refrigerate filters every several years will decrease compressor average life by a third.

What they refused to tell you
RULES OF THUMB II

ECO's

- PROGRAMMABLE THERMOSTATS - 2 to 7
- LIGHTING RETROFITS - 3 to 5 Year Payback
- ENERGY MANAGEMENT SYSTEMS - 6 to 15
- ROOF INSULATION - 9 to 16 Year Payback
- WALL INSULATION - 13 to 20 Year Payback
- WINDOW REPLACEMENT - 15 to 25 Years
- OCCUPANCY SENSORS - 1 Year to 25 Years

What they would'nt tell you
RULES OF THUMB II

DISCUSSION

Utility Bills
1) Taxes / Assessments - State and or local
2) Wrong bill for the facility.
3) Submetering of a quantity of co-located facilities.
4) Wrong meter conversion factor.
5) Incorrect rate schedule
6) Improperly sized equipment.

What they would'nt tell you
RULES OF THUMB II

DISCUSSION continued

- TEMPERATURE AVERAGE SETTINGS BELL CURVE AVERAGES
  - MEN 67°F to 73°F
  - WOMEN 71°F to 75°F
  - Add 1°F for every 10 years over 30 years old.
- ECOLOGICAL FLORESCENT TUBES (GREEN TIPS) IS THERE REALLY A SAVINGS?

What they would'nt tell you
RULES OF THUMB II

DISCUSSION continued

- OUTSIDE LIGHTING - security or night contamination?
  - Motioned Sensor / Photo eyed controls
  - Delite or Timer controls with overrides
- RESISTANCE HEATERS-People will find a way to be comfortable.
  - Authorization letter and agreement
  - Motion sensor plug in strip for control
- **INCENTIVES WORK-TIME or MONEY**

What they refused to tell you
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QUESTIONS?

DON JUHASZ

(208) 288-1345

don.juhasz@mactec.com

What they refused to tell you
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THE END

There are few electrically powered devices today that waste as much of their generated product as many common outdoor lighting fixtures do. The night sky over most communities is aglow with wasted illumination from misdirected or overdone lighting. More often than not, lighting is generously applied to an area or subject, with little attention paid to containing light within the task area. The resulting light intrusion into areas outside the task area have created modern-day afflictions called Light Pollution and Light Trespass.

Security lighting... or Insecurity lighting?
Lighting is often installed to deter or prevent crime. For site security, "maximum coverage" fixtures are typically used like dusk-to-dawn floodlights and unshielded wallpacks. The glare from such lighting causes extreme contrast and promotes low peripheral visibility, thereby defeating its purpose. Although static dusk-to-dawn lighting "feels" like a protective measure, it can actually assist criminals more than deter them. Major studies on security lighting's effect on deterring crime are at best inconclusive. (See footnotes).

So, what are the solutions?
Many of these problems associated with outdoor lighting can be solved by using a little common sense.

* Simply put, efficient use of energy in lighting is that which: (1) applies all or most of its generated light to the task at hand. (2) Uses no more light or energy than is necessary for safety in the task area. (3) Has controls that only have the light on when it is needed.
* In the security industry today, professionals will attest that if lighting is used to prevent theft, motion or infrared-sensored lighting would be more successful than static floodlighting. Since motion or infrared-sensored lighting creates an alerting "change of environment", it draws attention to any activity at a site.
* We must increase awareness. The way to achieve better outdoor lighting is through education. To ignore these many problems and continue pandering to society's "perception" of good lighting is irresponsible.
* The physiology of the human eye must be taken into account when designing outdoor lighting. To best facilitate peripheral vision at night, "contrast" between light sources, lit areas and dark surroundings must be reduced. Softer, more transitional light levels, which are as consistent as possible from area to area, should be employed. (Recommended levels set by the IESNA should not be exceeded-see footnote). Also, fully-shielded/recessed light sources or "full cutoff" type (FCO) fixtures should be the prevailing choice in all outside installations. Such fixtures and light sources available from most manufacturers.

There is no excuse for glare, and it should be avoided in all applications. This is easily achieved by specifying fully-shielded/recessed light sources or FCO type fixtures. Any fixture that presents a viewable light source as part of its functional appearance is going to affect visual perception at night by varying degrees. Epitomizing the problem of outdoor glare is floodlighting. No matter how it is aimed, floodlighting always produces glare, even from extremely off-axis angles. The wide broadcast of light produced by floodlighting regularly affects neighboring areas, roadways and the night sky - even across large distances. Given its lack of redeeming qualities, floodlighting should ultimately become obsolete.

* Unnecessary and hazardous overlighting, as in commercial "lumen wars" can be avoided by responsibly following guidelines for the maintained illumination levels and uniformity ratios recommended by the IESNA. Again, glare from these sites is avoided by specifying fully-shielded/recessed light sources or FCO type fixtures.

In Summary.

At this juncture, we must look at where we are and learn from our mistakes. Our goal for the future must be to balance the functional needs of lighting with the unchangeable givens of nature's design. Five-hundred years ago, a Renaissance challenged convention and illuminated the world. In the next millennium, our challenge is to illuminate it wisely and only when needed.

Footnotes

"Preventing Crime, What Works, What Doesn't, What's Promising" A report to the United States Congress / The National Institute of Justice <http://www.ncjrs.org/works/wholedoc.htm>

"Outdoor Parking Lot Lighting" Nancy Clanton and James Benya. An E Source Report. E Source, Inc. 1033 Walnut St. Boulder CO 80302-5114, <www.esource.com>

"Study of Streetlighting and Crime" 7/77 by James M. Tien / US Dept. of Justice, <http://www.darksky.org/ida/ida_2/info63.html>

"Light, Sight and Photobiology" Peter Boyce from Lighting Futures publication/Lighting Research Center, Rennselaer Polytechnic Institute. <http://www.lrc.rpi.edu/Futures/LF-Photobiology/index.html>

"Does Light Have a Dark Side" Janet Raloff, Science News Magazine, October 17, 1998 Science News, 1719 N St. N.W., Washington, DC 20036 <http://www.sciserv.org/>

Lighting Handbook, Illuminating Engineering Society of North America. 120 Wall St., Floor 17, NY NY 100005-4001 / 212-248-5000,