

May 9, 1997

Representative Scott Gunderson, Chair
Assembly Urban & Local Affairs Committee
7 West - State Capitol

Dear Chairman Gunderson:

The lights could go out in Wisconsin early this summer. That is the word from the utilities industry. Have you read the papers? The utilities paint a bleak scenario; one in which they could shut off power first to business and then residential customers. The result of temporary blackouts will hurt businesses in this state, resulting in lost production, wages and profits. Some Wisconsin companies are considering transferring work to plants in other states to avoid lost production.

On March 25, 1997, Assembly Bill 88, relating to the regulation of outdoor light fixtures and bulbs or lamps used in outdoor light fixtures, received a public hearing in the Assembly Committee on Urban and Local Affairs. As you know, the bill promotes the wise use of nighttime lighting and energy savings. It was a long hearing on that Tuesday. AB 88 was the last one on the hearing agenda and the committee was tired.

On March 25, the pending energy crunch in Wisconsin had not been reported so the committee had little reason to look more than a few hours into the future. Well, an energy crunch is here! Hopefully, we can avoid others in the future but we will not unless we plan for the future.

This is an opportune time for the committee to take a step forward on energy savings and that can be done by your review and action upon the legislation presented to you as Assembly Bill 88. While some modifications may be needed in the proposed legislation, it is without question that saving nighttime energy and improved lighting can and will help Wisconsin now and in the future.

We are a society that often waits until something breaks before we react -- then sometimes we over react. Assembly Bill 88 will set up standards that over time will put Wisconsin in a better competitive position.

Sincerely,

Jim Baumgart
State Representative
26th Assembly District

JB:ae
cc: Committee Members

May 9, 1997

Representative John Lehman
Assembly Urban & Local Affairs Committee
409 North -- State Capitol

Dear Representative Lehman:

Enclosed is a copy of a letter that I sent to Representative Gunderson, Chair of the Assembly Urban & Local Affairs Committee.

The letter is in regard to Assembly Bill 88, relating to the regulation of outdoor light fixtures and bulbs or lamps used in outdoor light fixtures. I believe the letter is self-explanatory.

Sincerely,

Jim Baumgart
State Representative
26th Assembly District

JB:ae
enclosure

May 9, 1997

Representative Robert Goetsch
Assembly Urban & Local Affairs Committee
314 North -- State Capitol

Dear Representative Goetsch:

Enclosed is a copy of a letter that I sent to Representative Gunderson, Chair of the Assembly Urban & Local Affairs Committee.

The letter is in regard to Assembly Bill 88, relating to the regulation of outdoor light fixtures and bulbs or lamps used in outdoor light fixtures. I believe the letter is self-explanatory.

Sincerely,

Jim Baumgart
State Representative
26th Assembly District

JB:ae
enclosure

May 9, 1997

Representative David Brandemuehl
Assembly Urban & Local Affairs Committee
314 North -- State Capitol

Dear Representative Brandemuehl:

Enclosed is a copy of a letter that I sent to
Representative Gunderson, Chair of the Assembly Urban & Local
Affairs Committee.

The letter is in regard to Assembly Bill 88, relating to the
regulation of outdoor light fixtures and bulbs or lamps used in
outdoor light fixtures. I believe the letter is self-explanatory.

Sincerely,

Jim Baumgart
State Representative
26th Assembly District

JB:ae
enclosure

May 9, 1997

Representative Antonio Riley
Assembly Urban & Local Affairs Committee
307 West -- State Capitol

Dear Representative Riley:

Enclosed is a copy of a letter that I sent to Representative Gunderson, Chair of the Assembly Urban & Local Affairs Committee.

The letter is in regard to Assembly Bill 88, relating to the regulation of outdoor light fixtures and bulbs or lamps used in outdoor light fixtures. I believe the letter is self-explanatory.

Sincerely,

Jim Baumgart
State Representative
26th Assembly District

JB:ae
enclosure

May 9, 1997

Representative Tony Staskunas
Assembly Urban & Local Affairs Committee
303 North -- State Capitol

Dear Representative Staskunas:

Enclosed is a copy of a letter that I sent to Representative Gunderson, Chair of the Assembly Urban & Local Affairs Committee.

The letter is in regard to Assembly Bill 88, relating to the regulation of outdoor light fixtures and bulbs or lamps used in outdoor light fixtures. I believe the letter is self-explanatory.

Sincerely,

Jim Baumgart
State Representative
26th Assembly District

JB:ae
enclosure

May 9, 1997

Representative Chuck Schafer, Vice-Chair
Assembly Urban & Local Affairs Committee
4 West North -- State Capitol

Dear Representative Schafer:

Enclosed is a copy of a letter that I sent to
Representative Gunderson, Chair of the Assembly Urban & Local
Affairs Committee.

The letter is in regard to Assembly Bill 88, relating to the
regulation of outdoor light fixtures and bulbs or lamps used in
outdoor light fixtures. I believe the letter is self-explanatory.

Sincerely,

Jim Baumgart
State Representative
26th Assembly District

JB:ae
enclosure

May 9, 1997

Representative Steve Wieckert
Assembly Urban & Local Affairs Committee
9 North -- State Capitol

Dear Representative Wieckert:

Enclosed is a copy of a letter that I sent to
Representative Gunderson, Chair of the Assembly Urban & Local
Affairs Committee.

The letter is in regard to Assembly Bill 88, relating to the
regulation of outdoor light fixtures and bulbs or lamps used in
outdoor light fixtures. I believe the letter is self-explanatory.

Sincerely,

Jim Baumgart
State Representative
26th Assembly District

JB:ae
enclosure

May 9, 1997

Representative Annette "Polly" Williams
Assembly Urban & Local Affairs Committee
17 East -- State Capitol

Dear Representative Williams:

Enclosed is a copy of a letter that I sent to Representative Gunderson, Chair of the Assembly Urban & Local Affairs Committee.

The letter is in regard to Assembly Bill 88, relating to the regulation of outdoor light fixtures and bulbs or lamps used in outdoor light fixtures. I believe the letter is self-explanatory.

Sincerely,

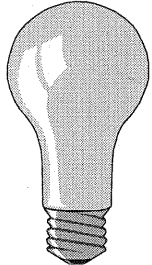
Jim Baumgart
State Representative
26th Assembly District

JB:ae
enclosure



State Representative
James R. Baumgart

26th Assembly District:
City of Sheboygan-
Wards 1-3,5,6,9,11-16
City of Sheboygan Falls
Village of Kohler
Town of Sheboygan
Town of Sheboygan Falls
Ward 4



February 26, 1997

MEMO

TO: INTERESTED & CONCERNED CITIZENS

FROM: REPRESENTATIVE JAMES BAUMGART

Re: **“DARK SKY” and “ENERGY SAVING”
LEGISLATION -- 1997 ASSEMBLY BILL 88**

On February 12, 1997, I introduced 1997 Assembly Bill 88 (AB 88), relating to the regulation of outdoor light fixtures and bulbs or lamps used in outdoor light fixtures.

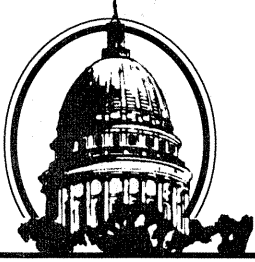
AB 88 was referred to the Assembly Committee on Urban and Local Affairs, chaired by Representative Scott Gunderson. A Public Hearing is scheduled on the bill for Tuesday, March 25, 1997, at 10:00 A. M., in Room 415 NW at the State Capitol.

The public hearing is the first step in the legislative process. It is very important that supporters of the bill attend the hearing and testify and/or register for the bill.

Enclosed is a copy of Assembly Bill 88 and a list of the members of the Assembly Committee on Urban Affairs.

In addition to contacting the members of the above committee, supporters should begin to make contact with their own legislators, asking for their support of the bill not only in committee, but on the Assembly Floor.

This bill is not a secret! Organize! Tell your friends and be sure to stress the importance of saving energy and stopping wasteful lighting!



State Representative
James R. Baumgart

26th Assembly District:
City of Sheboygan-
Wards 1-3,5,6,9,11-16
City of Sheboygan Falls
Village of Kohler
Town of Sheboygan
Town of Sheboygan Falls
Ward 4

TO: ALL LEGISLATORS
FROM: REPRESENTATIVE JIM BAMGART
DATE: JANUARY 3, 1997
RE: COSPONSORING LRB0316/1

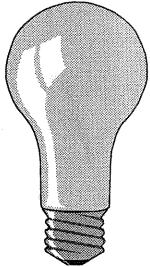
I will be introducing the following legislation, LRB0316/1, which promulgates rules regulating the design and installation of outdoor lighting to improve energy efficiency and to reduce inappropriate lighting. It will also make for darker skies. The lighting changes would occur during construction or remodeling. **If you have any questions or need further information on this energy efficiency legislation, or wish to sign on the bill, please call my office, 266-0656 by Friday, January 17, 1997.**

Analysis by the Legislative Reference Bureau

This bill requires the department of commerce to promulgate rules regulating the design and installation of lighting to improve energy efficiency and to reduce inappropriate lighting.

The bill also allows a city, village, town or county to enact outdoor lighting standards that are stricter than those promulgated by the department. Finally, the bill allows a city, village, town or county to apply its standards to outdoor light fixtures installed or constructed before the date on which those standards become effective.

For further information see the **state and local** fiscal estimate, which will be printed as an appendix to this bill.



February 26, 1997

M E M O

TO: INTERESTED & CONCERNED CITIZENS

FROM: REPRESENTATIVE JAMES BAUMGART

Re: **“DARK SKY” and “ENERGY SAVING”
LEGISLATION -- 1997 ASSEMBLY BILL 88**

On February 12, 1997, I introduced 1997 Assembly Bill 88 (AB 88), relating to the regulation of outdoor light fixtures and bulbs or lamps used in outdoor light fixtures.

AB 88 was referred to the Assembly Committee on Urban and Local Affairs, chaired by Representative Scott Gunderson. A Public Hearing is scheduled on the bill for Tuesday, March 25, 1997, at 10:00 A. M., in Room 415 NW at the State Capitol.

The public hearing is the first step in the legislative process. It is very important that supporters of the bill attend the hearing and testify and/or register for the bill.

Enclosed is a copy of Assembly Bill 88 and a list of the members of the Assembly Committee on Urban Affairs.

In addition to contacting the members of the above committee, supporters should begin to make contact with their own legislators, asking for their support of the bill not only in committee, but on the Assembly Floor.

This bill is not a secret! Organize! Tell your friends and be sure to stress the importance of saving energy and stopping wasteful lighting!

Eskeitz, Anne

From: Stolzenberg, John
Sent: Friday, March 21, 1997 7:58 PM
To: Eskeitz, Anne
Subject: AB 88 Information

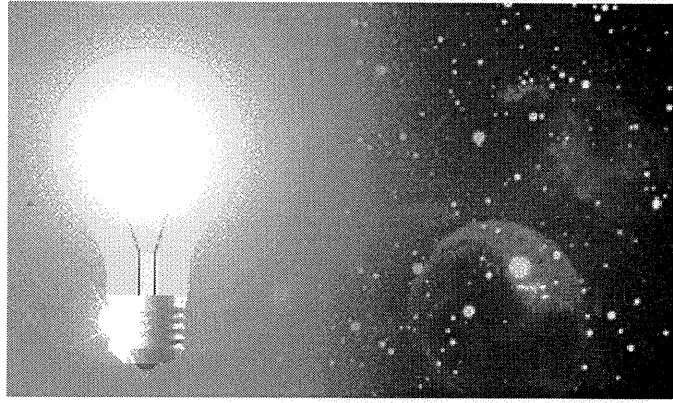
Anne,

Re Jim's request for information on the energy savings under AB 88, I asked Pat Meyer at the DOA Energy Bureau if he had any analysis of these savings. He responded that it would not be possible to develop an accurate estimate of the savings because the bill relies upon rules to implement it, and until the rules are promulgated, it is not known how tight the regulations will be. His staff is preparing a few scenarios, such as, if the bill results in a savings of 10% of the night time lighting energy, then X amount of energy savings results. I asked him to forward the results directly to you.

Also, I checked a few of the links at the International Dark-Sky's home page for leads to related energy conservation information. I'm sending you via page next Monday copies of 3 of these links.

John

John Stolzenberg, Legislative Council Staff Scientist
Phone: 608-266-2988 Fax: 608-266-3830
Email: john.stolzenberg@legis.state.wi.us
InterD Mail: 1 East Main St., Suite 401
US Mail: P.O. Box 2536, Madison, WI 53701-2536



Fred Schaaf's Light-Pollution Notes

Stargazers today face a problem that barely existed only a generation ago. *Light pollution* has spread so much in the last few decades that it compromises our view of the stars. For about half of us, the stars no longer really come out at all.

Yet most light pollution is unnecessary. It is not an inevitable result of having well-lit streets and cities. As much as three fourths of the murky glow you see in the sky at night is waste light beamed directly skyward from poorly designed or improperly installed light fixtures.

A standard security light, for instance, may send roughly half its rays above horizontal -- directly into the sky -- rather than down toward the ground where the light does any good. The upward half is pure waste. If the fixture is replaced with a well-designed, "full-cutoff shielded" fixture of various types now available -- one that directs all the light down where it's supposed to go -- the bulb wattage can be cut by half for a big savings of electricity and money. The quality of illumination is actually improved because of the reduction in glare, the near-horizontal beams that dazzle your eyes directly from a bulb. And we regain some of the lost starry heavens.

America wastes about \$1.5 billion per year in electricity bills needlessly spilling light into the sky, according to a study by the International Dark-Sky Association (IDA), a nonprofit group founded to educate the public and industry about light pollution. More on light pollution is available from the IDA at 3545 N. Stewart, Tucson, AZ 85716, U.S.A. Or point your Web browser to <http://www.darksky.org/~ida>.

Sky & Telescope contributing editor Fred Schaaf keeps a close watch on the light-pollution problem -- and its solutions -- and writes on the topic regularly in the magazine. Here are his collected Light-Pollution Notes, in reverse chronological order; new ones will be added as they are published. Schaaf welcomes mail at 681 Port Elizabeth-Cumberland Road, Millville, NJ 08332, U.S.A. You can send him e-mail at fschaaf@aol.com.

Fred Schaaf's Light-Pollution Notes	
September 1996	<u>Comet-Tail Photometers</u>
July 1996	<u>Learn Those Acronyms</u>
May 1996	<u>Ad Sign Lighting</u>
March 1996	<u>Decorative Lights</u>
January 1996	<u>1995's Good News</u>
November 1995	<u>What Not To Do</u>
September 1995	<u>Lighting for Visibility</u>
August 1995	<u>The Reply to "More Lights!"</u>
June 1995	<u>No Sky Tonight</u>
April 1995	<u>Down with Mercury Vapor</u>
February 1995	<u>Defining the Parts</u>
December 1994	<u>Many Ways to Act</u>
October 1994	<u>Getting Organized</u>
August 1994	<u>International Progress</u>
June 1994	<u>Naming the Beast</u>
May 1994	<u>The Near Sky: Sulfate Haze</u>
April 1994	<u>The Role of Air Pollution</u>
February 1994	<u>A Year of Awakening</u>
December 1993	<u>A Many-Pronged Approach</u>
October 1993	<u>Join the IDA!</u>
August 1993	<u>State Legislative News</u>
June 1993	<u>The "New Light" Threat</u>
April 1993	<u>State Laws for Dark Skies</u>
February 1993	<u>Light Pollution: A Winning Strategy</u>

Comet-Tail Photometers

Adapted from *Sky & Telescope*, Sept. 1996

Comet tails are sensitive indicators of sky quality. It's almost as if the tail were a sort of thermometer; but instead of measuring temperature, the length of the visible column measures the darkness of the sky.

The long tail of Comet Hyakutake last March provided some dramatic opportunities for documenting the effects of light pollution. Particularly striking to show the public would be photographs of the comet taken at the same time and revealing the vastly differing tail lengths at various distances from a city. The tail was a stubby 1° long as seen from many urban centers and up to 80° long in the country.

I'd like to receive comet photographs showing various degrees of light pollution. Please include all pertinent information about them. Perhaps we can develop a more scientific plan to document the effects on Comet Hale-Bopp next spring! Ideally the only variable would be sky brightness due to light pollution, not haze, moonlight, or altitude. And of course the camera settings, film, and development should be the same. Any volunteers?

[Return to Table of Contents](#)

Learn Those Acronyms

Adapted from Sky & Telescope, July 1996

Today's world is full of acronyms, and the field of light pollution is no exception. To begin with, there's no more important acronym in this area than IDA.

The International Dark-Sky Association is the largest and most effective group educating the public, government, and industry about light-pollution problems and solutions. Its work in the last decade has changed the light-pollution struggle from hopeless to winnable. For information write to the IDA, 3545 N. Stewart, Tucson, AZ 85716, U.S.A., or check out its home page at <http://www.darksky.org/~ida>. The IDA's existence depends on dues-paying supporters; basic membership is \$20 per year.

Can you recognize HPS and LPS lights? HPS stands for high-pressure sodium; these bulbs produce the pinkish golden, peach-colored light widely used at night. LPS stands for low-pressure sodium. LPS light is a monochromatic, deep yellow that renders colors poorly but is very energy-efficient. LPS is favored near observatories because it can be filtered out almost completely. When the city of Tucson, Arizona, began converting to LPS lights, area amateurs reported that their nebula filters started working better.

Finally, more amateur astronomers need to know about the organizations that set the standards for lighting engineers. IESNA (or just IES) is the Illuminating Engineering Society of North America. CIE is the Commission Internationale de l'Eclairage. The IDA has worked with both to promote the commercial availability of full-cutoff shielded (nonpolluting) fixtures.

[Return to Table of Contents](#)

Ad Sign Lighting

Adapted from *Sky & Telescope*, May 1996

Carelessly illuminated signs produce a significant portion of the light pollution over some cities. Look at a billboard from the side on a foggy night. You'll probably see that most of the rays from bottom-mounted lights miss the billboard altogether and beam directly into the sky.

Amateur astronomer Tom Buchanan singlehandedly got the city of Atlanta to pass a law in December 1994 allowing only top-mounted (downward-pointing) lights on new billboards. If one man can accomplish this in a city preparing to host the Summer Olympics, shouldn't all of us try?

One way to reduce light pollution from signs is to suggest the use of predominantly dark coloration -- bright lettering on a dark background rather than vice versa. And point out the electric-bill savings from putting the sign on a timer switch to turn it off at 11 or midnight, or at whatever hour the streets become empty of anyone to see it.

[Return to Table of Contents](#)

Decorative Lights

Adapted from *Sky & Telescope*, March 1996

Building façades and other structures are often brightly lit at night as the result of someone's vague hope of civic beautification or increasing a business's attractiveness. Much of this lighting is ugly and clearly should be eliminated. More than 15 years ago I attended a talk by consumer activist and environmental defender Ralph Nader, at which he joked that the only purpose for most such light on the outside of hotels is for people who want to stick a book out their window to read.

Good zoning rules prohibit such uglification. Unfortunately, a few years ago the casino industry near me in Atlantic City, New Jersey, pushed through a zoning change to allow a much larger percentage of a building's façade to be lit. Maybe gambling houses and other night spots need to look garish. But compromises can still be made. One of the casinos uses little upward lighting yet still has an attention-getting appearance.

On the positive side, I was recently pleased to see the beautiful, even, glare-free illumination provided by the full-cutoff fixtures on the Delaware Memorial Bridge, which is used by millions of East Coast travelers. The dazzling decoration on other great bridges is likely to be distracting and dangerous to motorists. Traffic accidents, an enormous waste of electricity, and the adverse environmental effects of what power plants do to produce that electricity are a high price to pay for a someone's idea of glitz.

[Return to Table of Contents](#)

1995's Good News

Adapted from *Sky & Telescope*, Jan. 1996

The uphill battle against light pollution continued to have its victories in 1995. If these were not always broad or conclusive, they were significant and encouraging.

Connecticut passed a state law much like that of Maine, generally requiring the state to buy only full-cutoff shielded lights for most locations. Full-cutoff shielding is the most critical step toward darkening the skies. It also improves the aesthetics of lit areas, prevents vision-hindering glare, and offers the potential for electricity savings.

Texans also tried launching a state bill, and activists in Massachusetts continued efforts on one. The New Jersey Light Pollution Study Commission, on which I sit, finally began meeting to make recommendations to the state.

More cities are converting to full-cutoff fixtures, either slowly or swiftly. Milwaukee and Denver have joined the ranks. Atlanta-area amateurs give one of their number, Tom Buchanan, the lion's share of the credit for getting a city law passed that allows only top-down lighting on all future advertising signs there.

Both the IDA (International Dark-Sky Association) and NELPAG (the New England Light Pollution Advisory Group) established World Wide Web home pages, allowing greatly improved access to light-pollution resources. Check them out at <http://www.darksky.org/~ida> and <http://cfa-www.harvard.edu/cfa/ps/nelpag.html>, respectively.

My own plan to produce a "light-pollution atlas" of the United States is coming closer to fruition. My friend Steve Albers continues to refine a computer program that will use U.S. census data to make light-pollution maps and estimate the sky's limiting magnitude at any U.S. site.

[Return to Table of Contents](#)

What Not to Do

Adapted from *Sky & Telescope*, Nov. 1995

This bimonthly column often concerns what amateur astronomers can do about light pollution. Here are some things they shouldn't do.

Don't dwell on astronomy as your central or only issue when discussing light pollution with officials or the public. Energy waste, annoying glare, and the dangerously poor visibility that results from glare carry more weight. Talk money and safety. It's fine to mention humanity's loss of the stars, but if you push this topic first, you may be dismissed as representing a tiny special-interest group.

Don't think big changes necessarily require a major involvement by many people. In some places they may. But to judge from my experience in New Jersey and what I know about other cases, a serious, protracted effort by three or four people can often get an amazing job done. Each victory sets a precedent for use elsewhere and makes the job easier for others who can copy your work instead of reinventing it. Victories against light pollution are being won, and the pace of success is quickening.

[Return to Table of Contents](#)

Lighting for Visibility

Adapted from *Sky & Telescope*, Sept. 1995

Last month in this space I discussed how to reply to those who think "more lights" is the answer to every outdoor lighting problem. Tell them what they actually want is not more lights but better visibility.

Explaining this distinction is a matter of common sense. Point out that we all know there can be too much of a good thing. If a good thing is overdone in the wrong place, it becomes a bad thing. Light sent in unnecessary directions, or excessive amounts of it, can be distracting and even disabling. Maybe an increase in the total light will help us see better. But more often what's needed is better shielding or pointing so that you can better see people and terrain, not the dazzling surfaces of light bulbs.

Give examples. Ask someone how often they have been driving along a dark road and been blinded by dazzling floodlights shining into their eyes from a parking lot or car dealership. Such lights on a rain-streaked windshield can turn the road totally invisible. That's a case where more light obviously means less visibility.

Lights should be shielded so that you see *no bright bulbs*, only *lit ground*. That's good visibility. It's also just what astronomers need to keep most light pollution out of the sky.

[Return to Table of Contents](#)

The Reply to "More Lights!"

Adapted from *Sky & Telescope*, Aug. 1995

"We need more lights!" That is what lovers of the night sky most dread hearing, and what they hear most often from neighbors fearful of crime, darkness, and the unknown.

How can you possibly counter this statement? The idea that light is good is deeply rooted in all of us; we're daytime animals. But there is a reply so clear and simple that it can convert all but the most irrational. Here it is: "What we need is not more lights but better visibility."

What is the distinction between more lights and better visibility? Your listener can't help but want to know.

Anyone concerned about light pollution has to be able to explain this distinction. If you know enough to define "glare" as dazzling light that shines directly from a bulb into your eye and hinders vision, and "full-cutoff shielding" as what a fixture needs to prevent glare and aim all its light down where it does some good, you're most of the way there. I'll discuss more about how we can best make this distinction next month.

[Return to Table of Contents](#)

No Sky Tonight

Adapted from *Sky & Telescope*, June 1995

When light pollution empties a sky of almost all its stellar riches, the result may be worse than even that deep impoverishment. We may lose the awareness that there is such a thing as the sky at all.

In the daytime, the city dweller who looks up between the buildings may glimpse only a monotonous flatness. The blue of a sunny sky has a variety of shades and brightnesses, all meaningful, that change through the day -- as do different parts of the sky, very beautifully, in twilight. Little of this gets noticed if even part of it is blocked.

But things are much worse at night. Avid astronomers, driven by fascination with the outer universe, use telescopes, filters, and expert finding skills to locate subdued wonders through the city skyglow. But most people, when deprived of the stars, cease to think of them as part of the real world at all.

A few years ago the *Philadelphia Inquirer* told of a novice skywatcher's attempt to show his son the wonders of the heavens from a bright suburban site. The attempt failed, for there was virtually nothing to see. The young boy, who had seen the sky by day, wanted to know where the sky had gone. The title of the article was "No Sky Tonight."

[Return to Table of Contents](#)

Down with Mercury Vapor

Adapted from *Sky & Telescope*, April 1995

As streetlights, they were almost entirely replaced by more efficient sodium-vapor lamps in the 1970s and 1980s. But the bluish-white glare of mercury vapor bulbs is still spreading in the form of badly designed dusk-to-dawn yard lights.

Mercury-vapor lamps are inherently wasteful. More than half the energy they consume goes into non-visible wavelengths. Unlike high-pressure sodium (HPS) and low-pressure sodium (LPS) lights, mercury vapor bulbs never die -- but that's not good because they do fade away. Their light output falls off by half about every five years, but since they don't really quit many people leave them up indefinitely, using just as much electricity for less and less illumination.

Mercury vapor lights are wasteful in another way too, one that's murder on astronomy. Like many yard lights, mercury vapor fixtures are almost always poorly shielded and directed, sending a large part of their light uselessly sideways and up. That's also bad news if you're using one of these lights for security. Dazzling horizontal glare in your eyes often makes it harder for you to see a burglar than for him to see you! The city of Tucson, Arizona, outlawed mercury vapor lights several years ago, a practice that should be extended everywhere.

What's a better way to light your property, assuming you need to at all? Look for an LPS light with full-cutoff shielding: a hood that cuts off horizontal rays and directs all the light at least 20° below the horizon. Look for one that you can restrict further to light only the areas you want. Better yet is a properly

shielded and pointed floodlight with an infrared motion sensor. I'll discuss these alternatives in an upcoming column.

[Return to Table of Contents](#)

Defining the Parts

Adapted from *Sky & Telescope*, Feb. 1995

Last June I defined light pollution as either "excessive or misdirected outdoor lighting" or as "any adverse effect of manmade light." But we can be more precise. The components of light pollution are defined in fact sheets of the International Dark-Sky Association, such as sheets 9 and 22. Here are the basics:

Skyglow (usually urban) is artificial light scattered back down toward the ground from the atmosphere. *Waste lighting* is light that pours needlessly upward or horizontally out of poorly designed fixtures. The rule of thumb is that only rays directed 20° or more below horizontal generally serve any useful purpose. Waste lighting also refers to needless overillumination. *Light trespass* is nuisance light that crosses property lines to fall where someone objects, such as into a bedroom window or onto your observing site.

Glare is light going directly to your eye from a bulb brilliant enough to interfere with your vision. Glare creates an ugly, uncomfortable environment. Contrary to most people's unconscious belief, directly viewing a light bulb does not increase your safety or security. The car you want to avoid hitting, the burglar you want to deter, are not tap-dancing up on the surface of the bulb like moths. They're down on the ground, which is the only place you should see illumination. The basic rule of good outdoor lighting is that no one should ever see a bright bulb. How many millions of times it's violated!

[Return to Table of Contents](#)

Many Ways to Act

Adapted from *Sky & Telescope*, Dec. 1994

My home state of New Jersey is probably the most light-polluted in the United States. But amateur astronomers here are working in a variety of ways to change that.

We wrote and helped pass a law forming a state light-pollution study commission. After long delays the commission, which includes an amateur astronomer (myself), should have started business by the time you read this. We intend to write statewide guidelines in a variety of areas to promote the triple benefit of less light pollution, less energy wasted lighting the sky, and better-quality illumination on the ground.

John Batinsey of Eatontown, New Jersey, wrote and got passed a city light-pollution ordinance so interesting that it is now offered by the International Dark-Sky Association (IDA) as a fact sheet. Batinsey's guide to adapting the ordinance to your own city is a separate fact sheet. Write to the IDA at 3545 N. Stewart, Tucson, AZ 85716, U.S.A., or go to <http://www.darksky.org/~ida>.

Last summer the New Jersey Department of Transportation (DOT) began removing numerous highway lights shining on road signs that were determined to be adequately reflectorized already. The annual saving from just this limited change is expected to be almost \$1 million.

One new tack may be to determine whether and how light pollution disrupts wildlife habitats. We have plans for doing that in New Jersey, and I will discuss this large topic in a future installment of this column.

[Return to Table of Contents](#)

Getting Organized

Adapted from *Sky & Telescope*, Oct. 1994

There's not only strength in numbers; there's opportunity for sharing talents, information, and solutions.

The first light-pollution organization that every amateur astronomer, club, and astronomy-related company should join is the International Dark-Sky Association (IDA). As of July the IDA had about 1,500 members worldwide. It has produced several slide sets and almost 100 useful fact sheets on light pollution and quality outdoor lighting. The address is 3545 N. Stewart, Tucson, AZ 85716, U.S.A. Basic membership is \$20 per year.

There may be a local section of the IDA in your area, and the IDA is also a good place to find out about other groups. One example is NELPAG, the New England Light Pollution Advisory Group. Unlike IDA sections, NELPAG can lobby for legislation. To get its newsletter send self-addressed stamped envelopes to Daniel W. E. Green, Harvard-Smithsonian Center for Astrophysics, 60 Garden St., Cambridge, MA 02138, U.S.A., or send your request by e-mail via NELPAG's World Wide Web site at <http://cfa-www.harvard.edu/cfa/ps/nelpag.html>. From NELPAG you can also learn about EJASA, the *Electronic Journal* of the Astronomical Society of the Atlantic, which often has interesting articles on light pollution.

Finally, there's no excuse today for any but the most rural of astronomy clubs not to have an active light-pollution committee. If you want to know what you can accomplish and how, IDA can provide plenty of ideas.

[Return to Table of Contents](#)

International Progress

Adapted from *Sky & Telescope*, Aug. 1994

The United States is not the only country where activism against light pollution is a stir.

In the United Kingdom, the Campaign for Dark Skies (CfDS) is active as a joint project of the British Astronomical Association and the International Dark-Sky Association (IDA). I'm impressed with its accomplishments and its literature; dark-sky advocates everywhere can benefit from studying its methods.

The coordinator of CfDS is Bob Mizon, 38 The Vineries, Colehill, Wimborne, Dorset BH21 2PX, United Kingdom. Or visit CfDS's Web site at <http://www.u-net.com/ph/cfds>.

Efforts to reduce light pollution are also being mounted in Quebec, Japan, Australia, Belgium, Denmark, Italy, Spain, Hungary, Brazil, and surely other countries. We are still in the early stages of the battle, but the movement for good lighting is growing rapidly.

[Return to Table of Contents](#)

Naming the Beast

Adapted from Sky & Telescope, June 1994

Choosing the right name for something gives us a certain power over it -- at least the power of understanding, and that is potent. Therefore, how should we name and define the problem most often called "light pollution"?

On one of its fact sheets, the International Dark-Sky Association (IDA) defines light pollution as "any adverse effect of manmade light." This is a most inclusive definition. But should we consider light pollution as the troublesome *result* of some lighting, or as the offending lighting itself? Both, I think, are legitimate. I usually define light pollution as excessive or misdirected outdoor lighting.

Is "pollution" too strong a description of what excessive or misdirected lighting does to the dark? I think not. What can we gather from comparing our term to similar ones such as air pollution and noise pollution?

Many other terms describe particular kinds of light pollution. I'll look at them in a future column.

[Return to Table of Contents](#)

The Near Sky: Sulfate Haze

Adapted from Sky & Telescope, May 1994

In last month's Light Pollution Notes I discussed the role of air pollution in worsening the skyglow from artificial lights. The worst offender in industrial countries is not smoke from local sources but high-altitude sulfate aerosols produced mostly by coal-burning power plants and industries far away.

Humidity alone does not make the sky hazy. There must be particles in the air to act as condensation nuclei for water vapor. Solid and liquid sulfate aerosols fill this role very effectively. They can stimulate the formation of tiny droplets that are extremely efficient at scattering sunlight or light pollution. As the humidity nears 100 percent the aerosols fall out of the sky as acid rain. But at about 60 or 70 percent humidity, they produce tiny droplets that can float for days as haze. Water in this form is a million times more effective than pure air at scattering light!

Fortunately, sulfur emissions in the United States peaked in 1970 and have since been reduced by about 30 percent. More reductions can be expected as further legislation against air pollution and acid rain is implemented and enforced. Welcome side effects should include bluer skies, improved summer daytime visibility, and night skies darker than they would otherwise be.

[Return to Table of Contents](#)

The Role of Air Pollution

Adapted from *Sky & Telescope*, April 1994

The amount of artificial light you see in the sky depends upon not just how much light shines upward within a few dozen miles of you, but also on how much stuff there is in the air to scatter it back down. Air pollution plays a more important role in this regard than you might think. One proof is how incredibly many more stars you can see from a city on those rare nights when a very clean air mass sweeps through.

It's not ordinary smog that does the damage, at least not over most of the continent for most of the year. Nor is it high humidity -- water vapor -- though this will come as a surprise to observers in the eastern United States, who find themselves blanketed by milky white skies during the humid summer months.

What scatters most sunlight, starlight, and light pollution in industrial parts of the world is liquid and solid sulfate aerosols, largely produced by coal-burning plants hundreds of miles or more away. Humid air doesn't become hazy without sulfate particles for the water vapor to condense on, notes the June-July 1993 *Weatherwise* magazine. In next month's column here, "The Near Sky," I'll discuss more on this topic, including hopeful news for all of us who want to see less skyglow -- and breathe a little more freely.

[Return to Table of Contents](#)

A Year of Awakening

Adapted from *Sky & Telescope*, Feb. 1994

The first installment of this bimonthly light-pollution column appeared one year ago. The year has seen new threats from proposed space mirrors and an angry step backward to more high-pressure-sodium lighting in San Diego. But the positive developments have been much more numerous and, I think, more significant.

New state light-pollution laws were passed in New Jersey, Michigan, and New Mexico, and bills were launched in other states. My offer to send copies of the laws and bills to readers prompted more than 80 requests from 30 states and six foreign countries. A second wave of state laws should be brewing, and in a future column I'll tell about several important new city laws.

Meanwhile, other light-pollution solutions are going into effect. Several major electric utilities across Canada have embarked on good-lighting programs that have *actually darkened the skies* near some cities!

The tide is turning, perhaps has already turned. Stay tuned -- and get involved.

[Return to Table of Contents](#)

A Many-Pronged Approach

Adapted from *Sky & Telescope*, Dec. 1993

Where's the best place to start if you want to get light pollution reduced? That depends on where you live. In Arizona, where cities are few and generally far apart, concentrating on changing local laws city by city has paid off. Here in New Jersey, where over 500 bright municipalities practically overlap, state legislation has been especially important.

The best approach is to seek action on many fronts. Get involved in efforts for both state and municipal legislation. Try also for direct administrative action -- for instance, by your state's department of energy or environmental protection to reduce energy waste from fixtures sending light needlessly sideways or up into the sky. Another route is to begin courteous discussions with electric utilities in your area.

Ask your state transportation department and your town's department of public works to switch to properly shielded, "full cutoff" streetlights, which direct all their light toward the ground, every time they replace a bulb. Tell them of the fast payback in energy savings, and back it up with fact sheets from the International Dark-Sky Association (3545 N. Stewart Ave., Tucson, AZ 85716, U.S.A.). Business organizations may take an interest too.

Different efforts build upon each other. All help to create a climate in which waste light in the sky is noticed and action against it is deemed both possible and desirable.

[Return to Table of Contents](#)

Join the IDA!

Adapted from *Sky & Telescope*, Oct. 1993

When someone asks "What can I do about light pollution?", I usually reply, "Have you joined the IDA?" The International Dark-Sky Association, founded five years ago, gathers and disseminates light-pollution information and solutions on many fronts. It has played a central role in the current slow but real turning of the tide in the light-pollution war.

For decades astronomers were pitifully ineffective against the spread of waste light. Few even saw the point of speaking up. Now the IDA is winning over key sectors of the nonastronomical public -- including government bodies, parts of the lighting industry, and a few electric utilities -- with its arguments that good lighting for astronomers means energy savings and more attractive surroundings for everyone else.

The IDA's work is funded by its 1,300 contributing members, and more are needed. For every amateur astronomer who has joined, several hundred haven't. Many of them spend thousands of dollars on private

equipment but balk at paying \$20 a year toward public solutions to help preserve the use and value of that equipment.

In addition to its leadership with government and industry, the IDA provides essential resources for individuals tackling light pollution in their communities. Among these are its informative newsletter and a wide variety of useful fact sheets to pass out to neighbors, the public, and lighting decision-makers.

You can send your \$20 membership check to IDA, 3545 N. Stewart Ave., Tucson, AZ 85716, U.S.A..

[Return to Table of Contents](#)

State Legislative News

Adapted from *Sky & Telescope*, Aug. 1993

In the April issue I mentioned Maine's new light-pollution law and New Jersey's bill to study and develop statewide lighting regulations. I asked interested people to write, and the response was impressive.

I received copies of light-pollution bills that have already been introduced in Massachusetts and Michigan. I learned of people eager to start the ball rolling in Iowa and Connecticut and of city officials interested in ways to reduce light wastage locally. Other information requests came from all across the United States and from Canada, Belgium, Germany, and Spain.

Since then the New Jersey bill has been enacted; I expect to work with the commission it establishes. Anyone who wants copies of any of the state light-pollution laws or proposals, or related information, can send me a long self-addressed stamped envelope: Fred Schaaf, R. D. 2 Box 468, Millville, NJ 08332.

[Return to Table of Contents](#)

The "New Light" Threat

Adapted from *Sky & Telescope*, June 1993

A frightening potential advance in light pollution was unfurled last February, as reported on page 13. Russian cosmonauts deployed a 20-meter space mirror to direct sunlight to the ground at night in a preliminary test of Russia's New Light program. Plans for New Light, its director says, envision 100 orbiting mirrors 400 meters in diameter. Each would be able to illuminate a spot several kilometers wide with dozens of times the light of the full Moon.

Seen from the side, these spotlight beams coming down through the atmosphere might compromise the night for over 100 km in all directions.

We worry, with good reason, about the destruction of the rain forests and other biomes and the resulting effects on the Earth's natural balances. But in one sense night is a larger environment than any of these. The day-night cycle is almost as basic to life as air, water, and sun. A large fraction of the Earth's animals

are nocturnal. I've seen documented damaging and fatal effects of light pollution on whole populations of birds, reptiles, and plants. And I believe that the natural darkness of night resonates with a deep part of the human psyche or soul.

"Night is a right," says the astronomer's bumper sticker. Write to the major environmental organizations and tell them that disastrous effects could result if space mirrors are developed and used carelessly. Write also to the Planetary Society (65 N. Catalina Ave., Pasadena, CA 91106, U.S.A.), since it may have as much influence as anyone on the Russian company that plans to market the use of the mirrors.

[Return to Table of Contents](#)

State Laws for Dark Skies

Adapted from *Sky & Telescope*, April 1993

After decades of hopeless inaction, the bandwagon against light pollution is rolling. Last year the state of Maine enacted a law requiring full-cutoff shielding for lights on all state highways and other state land. "Full-cutoff" should become the astronomer's mantra; it refers to fixtures that direct all their light downward where it belongs. A similar and possibly tougher bill in Kansas was defeated in 1992 but may pass this year now that its main political opponent has retired.

In New Jersey, where I live, our bill to set up a Light Pollution Study Commission is moving toward passage. Such a commission could propose many effective changes in outdoor lighting to the state legislature -- to save not just the stars but energy bills and power-plant pollution by reducing waste light that shines needlessly upward. Activists in Maryland and California have expressed interest in our bill. The Florida legislature may also consider statewide action.

Much of the light-pollution problem will have to be tackled at the city and town level; more on that in an upcoming column. But these state laws can lead the way to some significant reductions of skyglow soon. Anyone who knows of other state light-pollution legislation, or wants more information on what I've mentioned here, can write to me at fschaaf@aol.com.

[Return to Table of Contents](#)

Light Pollution: A Winning Strategy

Adapted from *Sky & Telescope*, Feb. 1993

The world wants and needs good outdoor lighting. So how much light pollution can we ever realistically get rid of? Amazingly, about three-fourths of it. Lighting experts estimate that this much skyglow can be eliminated while maintaining good illumination on the ground.

The reason is that most skyglow comes from fixtures *wasting* light by sending it directly into the sky rather than down toward the ground where people want it. In the United States alone this waste amounts to \$1 to \$2 billion a year in needless electric bills, and the energy equivalent of tens of millions of barrels of oil.

These facts are the first that you as an astronomer should present to officials and the public in your area. Will they listen? When astronomers take the money-saving tack, they sometimes find red carpets rolling out for them in cash-starved legislatures and city halls.

In Arizona, every county and most cities now have some kind of light-pollution ordinance, and every one passed unanimously. Maine has a strong new law against light pollution on state property, and other states are considering such laws. My article on light pollution in the 1993 *Old Farmer's Almanac* gives the address of the International Dark-Sky Association (3545 N. Stewart, Tucson, AZ 85716, U.S.A.; dues \$20 a year) and could be read by millions of people.

We're just getting started. Send your light pollution news to *Sky & Telescope*, and watch this column for reports from the battlefield.

[Return to Table of Contents](#)



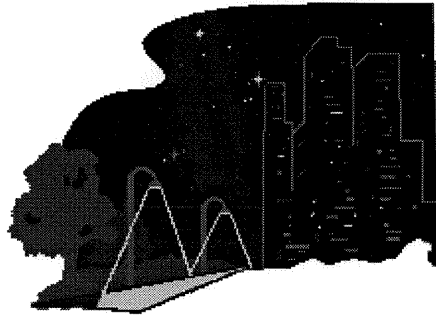
[[SKY Online Home Page](#) | [Sky & Telescope](#) | [CCD Astronomy](#) | [Search SKY Online](#)]

Copyright © 1996 Sky Publishing Corporation, All Rights Reserved.

This material may not be reproduced in any form without permission.

For more information contact Sky Publishing Corp., P.O. Box 9111, Belmont, MA 02178-9111, USA.

Phone: +1-617-864-7360. Fax: +1-617-576-0336 (editorial only), +1-617-864-6117 (all other). Or send e-mail to webmaster@skypub.com.



International Dark-Sky Association

3545 N. Stewart Ave., Tucson AZ 85716 U.S.A.

E-mail: crawford@darksky.org

WWW: <http://www.darksky.org>

Operating Data and the Economics of Different Lamps

Information Sheet 4, January 1990

Assume:

- 4100 hours of use per year (average nighttime hours, dusk to dawn)
- 8¢ as the cost per KWH (Kilowatt hour, the power rate)

Low Pressure Sodium

	180W	135W	90W	55W	35W	18W
Initial Lumens	33000	22500	13500	8000	4800	1800
Mean Lumens	33000	22500	13500	8000	4800	1800
Lamp Wattage	180	135	90	55	35	18
Circuit Wattage	220	180	125	80	60	30
Intial Lum/watt	150	125	108	100	80	60
Mean Lum/watt	150	125	108	100	80	60
Annual KWH Use	902	738	513	328	246	123
Annual Oper Cost	\$72.16	\$59.04	\$41.00	\$26.24	\$19.68	\$9.84

High Pressure Sodium

	400W	250W	200W	150W	100W	70W	50W
Initial Lumens	50000	27500	22000	16000	9500	6000	4000
Mean Lumens	45000	24750	19800	14400	8550	5500	3600
Lamp Wattage	400	250	200	150	100	70	50
Circuit Wattage	465	294	246	193	130	100	66

Initial Lum/watt	108	94	89	83	73	60	61
Mean Lum/watt	97	84	80	75	66	55	55
Annual KWH Use	1907	1205	1009	791	533	410	271
Annual Oper Cost	\$152.52	\$96.43	\$80.69	\$63.30	\$42.64	\$32.80	\$21.65

Mercury Vapor

	1000W	700W	400W	250W	175W	100W
Initial Lumens	55000	36400	20500	11850	7850	4100
Mean Lumens	46200	29850	18570	10540	7140	3230
Lamp Wattage	1000	700	400	250	175	100
Circuit Wattage	1090	765	455	285	205	135
Initial Lum/watt	50	48	45	42	38	30
Mean Lum/watt	42	39	41	37	35	24
Annual KWH Use	4469	3137	1866	1169	841	554
Annual Oper Cost	\$357.52	\$250.92	\$149.24	\$93.48	\$67.24	\$44.28

Metal Halide

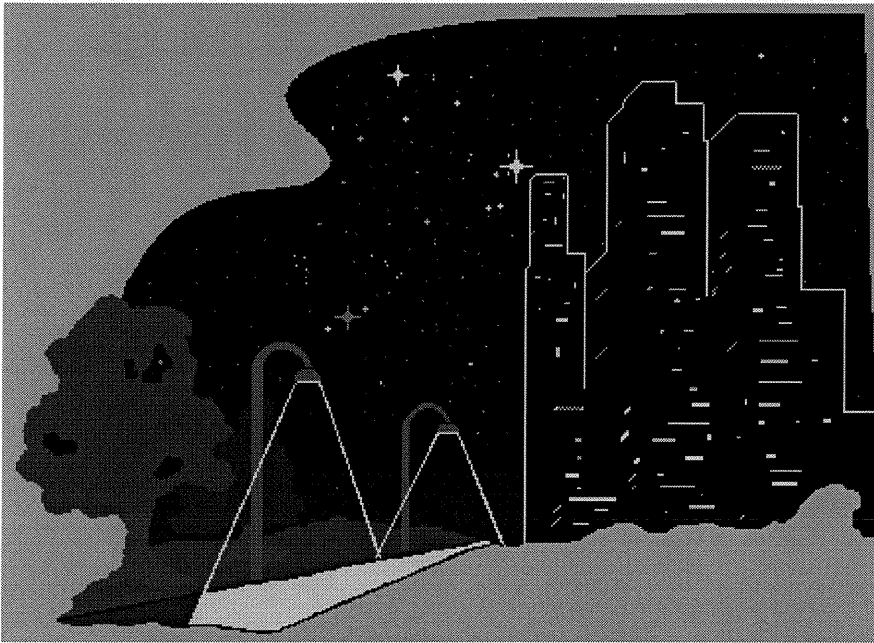
	1000W	400W	250W	175W	Incandescent		
					300W	200W	150W
Initial Lumens	110000	34000	19500	14000	6360	4000	2880
Mean Lumens	88000	25600	17000	10800	6360	4000	2880
Lamp Wattage	1000	400	250	175	300	200	150
Circuit Wattage	1140	465	295	220	300	200	150
Initial Lum/watt	96	73	66	64	21	20	19
Mean Lum/watt	77	55	58	49	21	20	19
Annual KWH Use	4674	1907	1210	902	1230	820	615
Annual Oper Cost	\$373.92	\$152.52	\$96.76	\$72.16	\$98.40	\$65.60	\$49.20

Most columns are lined up at nearly equal lumen output, to show the relative energy & cost savings.

This material is copyrighted (©) by the **IDA**, or others as noted. It may be reproduced for non-commercial usage provided that credit is given to **IDA**.

[Go back to the IS list](#)

[Go back to the **IDA** homepage](#)



International Dark-Sky Association

3545 N. Stewart Ave., Tucson AZ 85716 U.S.A.

Theft of the Night

Text of a December 1989 National Academy of Sciences Op-Ed Press Release by David L. Crawford

A priceless part of our human heritage is fading into the night sky.

Most Americans are growing up unable to see the stars their grandparents knew so well. They see the night sky only in pictures or at planetariums. This is true not only in cities, but also in many suburbs where street lamps and other sources of "light pollution" have obscured our view of constellations, meteor showers, and planets.

Indeed, many youngsters may now say, after viewing the night sky in a rural area for the first time, that "it looks just like the planetarium".

Light pollution is not a matter of life and death. Yet it is important nonetheless, profoundly so. We human beings lose something of ourselves when we can no longer look up and see our place in the universe. It is like never again hearing the laughter of children; we give up part of what we are.

Such a loss might be acceptable if light pollution were the inevitable price of progress, but it's not. Most sky glow, as scientists call it, is unnecessary. The light that obscures our view of the night sky comes mainly from inefficient lighting sources that do little to increase nighttime safety, utility or security. It produces only glare and clutter, costing more than \$1 billion annually in wasted energy in the United States alone.

For science, the impact has been even more tangible and adverse. Astronomers require observations of extremely faint objects that can be made only with large telescopes at sites free of air pollution and urban sky glow. For example, scientists interested in how the universe was formed may study the light of galaxies and quasars at incredibly vast distances from Earth. These images offer information about faraway corners of the universe, helping us understand how our own world was formed. Yet, after traveling countless light years, the light from these objects can be lost at the end of its journey in the glare of our own sky.

Space-based telescopes, such as the Hubble Space Telescope scheduled to be launched by the shuttle in March 1990, offer one way around the problem. However, large telescopes on Earth will always be used, if only because they are accessible, cost much less than orbiting devices, and can do many jobs more cheaply.

In fact, our experience over the past two decades has shown that space-based astronomy, far from reducing the need for ground-based observations, actually increases the demand for these facilities. New telescopes now planned or under construction on Earth will complement the knowledge we gain from telescopes in space -- but only if they are not compromised by encroaching light pollution, as has occurred at Mount Wilson, near Los Angeles, and several other older observatories.

Reducing light pollution is not difficult, but it does require public officials and ordinary citizens be aware of the problem and act to counter it. Low pressure sodium light, for example, can replace existing fixtures for most streets, parking lots, and other locations. They reduce glare and save money.

Another fairly painless way to reduce light pollution is with outdoor lighting control ordinances, over 50 of which have been enacted throughout Arizona and in several key cities and counties in California and Hawaii. These measures typically require communities to prohibit inefficient, low-quality lighting. Not only do they help preserve dark skies, but they also enhance energy efficiency. An outdoor light system recently installed at a prison in Arizona, for example, improved security and reduced light pollution while cutting energy costs by 50 percent. There is no reason that all communities should not have such efficient lighting.

On an individual level, people can help reduce sky glow by using night lighting only when necessary, choosing well shielded fixtures and turning off lights when they are not needed.

Curing light pollution saves money while reducing glare. Unlike other issues involving pollution, it presents us with a rare case where we should strive to be kept in the dark. The stars above us are a priceless heritage -- not only for scientific knowledge, but also for our identity as human beings.

More of our children -- and their children -- should be able to look up at night and see the Milky Way isn't only a candy bar.

National Academy of Sciences

[Go back to IS list](#)

[Go back to IDA homepage](#)

An address to the Assembly Committee on Urban & Local Affairs,
Tuesday, March 25, 1997

Mr. Chairman, members of the committee.

My name is Kevin Zimmermann. I would like to speak in support of AB88. I am past president of the Sheboygan Astronomical Society and, along with many others have pursued the establishment of "dark skies" legislation for the past few years through Representative Baumgart, former Representatives Susan Vergeront & Wilfred Turba, as well as Senator Calvin Potter. I am grateful for the opportunity to address this important issue.

The legislation being considered today has more than one important goal. That goal of conserving energy is not a new one, but a goal that has been muted as our energy supplies continue a pattern of relative affordability, even as we draw our limited resources to inevitable exhaustion. This aspect alone should be enough to pursue a direction which judiciously manages our resources.

The aspect which most interests me, and the goal that motivates me to address this committee today is that of restoring Wisconsin skies to a condition that has slowly, incessantly been diluted until it can rarely be found. This goal was restated recently while guiding some novice observers to a view of comet Hale-Bopp. It is hard to imagine that, while this is perhaps the brightest comet most will ever view, and that a comet of this magnitude during the middle ages would have been viewed throughout civilization as portending the fall of empires, it had to be explained that this seeming feeble light was only perceived as such because we have diluted it with light from the ground; that, were it not for our liberal application of light energy, we will now only imagine, and not realize why such an object had such an impact in earlier times.

I wonder how many of you remember newsreels of amazing new inventions from the earlier part of this century; how many seemingly good ideas proved in the end to be impractical or outdated.

Just as we are now phasing out Tom Edison's 1879 model incandescent lamp in favor of more efficient light sources, it is time to introduce a degree of common sense to the management of this light, and to retire the practice of haphazardly scattering light to illuminate only a small area under its influence. At the heart of this effort, AB88 will serve to reduce the wasteful emission of light, to replace inefficient sources with up-to-date, energy-saving lamps, and to establish standards of illumination that ensure a safe nighttime environment for all and to preserve the dark skies necessary to conduct astronomical research. Also, by doing this our utilities will be burdened

less by the need to expand generating capacity, contributing to Wisconsin's stability for all segments of society; public, private, business and industry. And greenhouse gas emissions can be reduced as well.

As an amateur astronomer, I have already boasted to many from elsewhere in the country about the night sky from some parts in Wisconsin. Yet our sky is far from its former glory and without planning, will deteriorate further. I don't know if you are aware of the fact, but right here in Wisconsin, amateur astronomers have led the development of tools & techniques available to astronomers everywhere that are producing valuable information for research. For instance, amateurs now monitor many galaxies per night, searching for rare supernovae that, once detected, can be studied by the professionals that are too burdened to undertake the discovery phase of research. Dark skies are critical for many such endeavors.

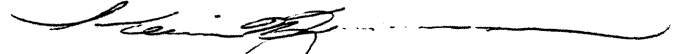
We realize the need for lights in creating a safe urban and rural environment. No one promoting dark skies legislation is attempting to "turn out the lights". We're simply trying to direct light where it is needed and to keep it away from where it is neither useful nor wanted.

Imagine if you will, a plant in your office that needs watering. Will you bring in a garden sprinkler and shower the room with water, knowing that some will eventually land in the flower pot? Yet this is the kind of senseless practice employed too often for outdoor lighting. Poorly installed & designed lighting wastes energy, produces glare that can be counterproductive for security purposes, and bothers all within line-of-sight, like it, or not. It should not be so. Wisconsin passed a law restricting sound energy from auto stereos to prevent acoustic energy trespass. Should light trespass enjoy special treatment?

Finally, as we consider why this bill is needed, think of an "intangible" for a moment. Our generation now in this room is the first in the history of the world that has been denied easy access to a view of the heavens above. Our skies today are a sad leftover of a past that inspired great men and women to think..to explore..to dream. Would Vincent Van Gogh in 1997 be laboring over a canvas, trying to capture a starry night in oils? Would Gustav Holst write the symphonic poem "The Planets" under a milky haze? Or would the Winnebago and Oneida and other Native Americans have any stories & legends to relate once their signposts in the sky are drowned out by the signposts lining the nearby freeway? Wisconsinites pride themselves in having a state where natural resources are treasured & jealously guarded. A dark night sky deserves its place among these things that make Wisconsin a special place. I urge the passage of AB88 so that we can continue to lead the nation in preserving this endangered

aspect of the good Wisconsin Life. Thank you for your kind consideration.

Sincerely,

A handwritten signature in cursive script, appearing to read "Kevin Zimmermann", written over a horizontal line.

Kevin Zimmermann

STATEMENT TO ASSEMBLY URBAN AND LOCAL AFFAIRS
COMMITTEE -- MARCH 25, 1997 -- ASSEMBLY BILL 88

MR. CHAIRMAN AND MEMBERS OF THE COMMITTEE

Thank you for the opportunity to speak to you on Assembly Bill 88.

As you or may or may not know, Wisconsin is an energy poor state (no coal, oil or gas) with 6-7 billions of dollars being sent out-of-state each year. We know that poorly directed and/or inefficient lighting wastes substantial dollars. These are dollars that certainly could be better used by this state and its citizens in our very competitive world market.

James Thurber, U.S. humorist, illustrator and writer said:

“There are two kinds of light
The glow that illumines
And the glare that obscures”

The intent of Assembly Bill 88 is to save energy, improve lighting and to be dollar user friendly. It provides for energy-saving and cost-efficient lighting through rules promulgated by the Department of Commerce -- these rules being substantially similar to many regulations contained in building codes adopted by the Department. To give flexibility, at the local level, the bill allows counties, cities, villages or towns, in order to meet specific needs, to enact ordinances that are more restrictive than state standards. It gives or keeps some local control and direct involvement.

Page 2

For astronomers, this bill has the added benefit that improved lighting would limit diffused skyward reflection and darken the sky by controlling light loss and improving the view of the sky.

Wisconsin has not done the kind of job on good lighting that its citizens deserve. Arizona has enacted legislation that enables cities and counties to adopt outdoor lighting control ordinances and all counties and most cities in that state have done so. The Tucson ordinance has been in effect for almost 20 years and the city has won several energy savings' awards due to its improved lighting, new and retrofitted. The states of Maine, Texas and Virginia regulate outdoor lighting. California and Hawaii have local controls that seem to be working well. Wisconsin, an "energy poor state", needs to make every effort to improve its energy conservation standards that will take us into the 21st Century.

A statement put out by the International Dark-Sky Association, of Tucson, Arizona, sums it all up -- "Quality lighting will give us all a more efficient, safer, aesthetic nighttime environment. We also save a great deal of energy and money by using the light, not wasting it. We all win!"

It is my hope that we can all work together to improve the effective energy and outdoor lighting use in Wisconsin.

ASSEMBLY URBAN AND LOCAL AFFAIRS COMMITTEE

Representative Scott Gunderson, Chair
7 West -- State Capitol
Telephone: 608-266-3363

Members:

Representative Chuck Schafer
4 West -- State Capitol
Telephone: 608-266-9172

Representative Robert Goetsch
314 North -- State Capitol
Telephone: 608-266-2540

Representative David Brandemuehl
317 North -- State Capitol
Telephone: 608-266-1170

Representative Steve Wieckert
9 North -- State Capitol
Telephone: 608-266-3070

Representative Antonio Riley
307 West -- State Capitol
Telephone: 608-266-0645

Representative Annette "Polly" Williams
17 East -- State Capitol
Telephone: 608-266-0960

Representative Tony Staskunas
303 North -- State Capitol
Telephone: 608-266-0620

Representative John Lehman
409 North -- State Capitol
Telephone No. 608-266-0634

Mailing Address for State Representatives:

P. O. Box 8952 (Last Name Beginning with A-L)
Madison, WI 53708

P. O. Box 8953 (Last Name Beginning with M-Z)
Madison, WI 53708

People may use the Legislative Hotline (toll-free) Number to contact the Legislator representing the district in which they live. That number is: 1-800-362-9472

**Citizens for a Better Environment
John Muir Chapter - Sierra Club
Madison Audubon Society
Wisconsin's Environmental Decade**

**IN SUPPORT of 1997 AB 88, Energy Efficient Lighting
Before the Assembly Committee on Urban and Local Affairs
March 25, 1997**

Citizens for a Better Environment, the John Muir Chapter - Sierra Club, the Madison Audubon Society, and Wisconsin's Environmental Decade, representing over 100,000 members and supporters statewide, urge your support of AB 88, Energy Efficient Lighting. We thank Rep. Jim Baumgart, the lead author, for again introducing this important energy conservation legislation. We hope that past educational efforts on the significant energy benefits of this proposal will lead to legislative adoption this session. We note that AB 88 includes the amendment requested last year to exempt seasonal holiday decorations between November 1 and January 31.

Improving the efficiency of energy use is the cheapest method of:

- reducing the rate of energy consumption
- reducing pollution associated with energy production and distribution
- reducing the costs of energy production
- reducing the need for construction of additional electrical generation capacity
- reducing the export of Wisconsin dollars for costly energy supplies.

AB 88 will ensure the sale and installation of energy efficient outdoor light fixtures and bulbs or lamps in outdoor light fixtures. The bill requires the Department of Commerce to promulgate rules regulating the design and installation of outdoor lighting to improve energy efficiency, provide better quality lighting and to reduce inappropriate lighting. AB 88 also allows municipalities to adopt and enforce more strict standards.

Electricity use for lighting, both indoor and outdoor, in the residential and commercial sectors has grown steadily in the past two decades. A surprising number of energy-inefficient fixtures are in common use. The impact of AB 88 will be to save homeowners and retailers electrical costs.

But cost savings is only one of the benefits of AB 88. Good outdoor lighting is designed for a purpose -- illuminating the ground for safety, utility at work sites or advertising, without blinding glare, energy waste, or offending the neighbors. Often outdoor lighting fixtures and bulbs waste light upward into the night sky. This wasted light does not serve the intended purposes of illumination and often offends neighbors. This wasted light also threatens astronomical research and educational family night sky viewing, as those of us who have been viewing Comet Hale-Bopp and Sunday's eclipse of the moon are only too aware.

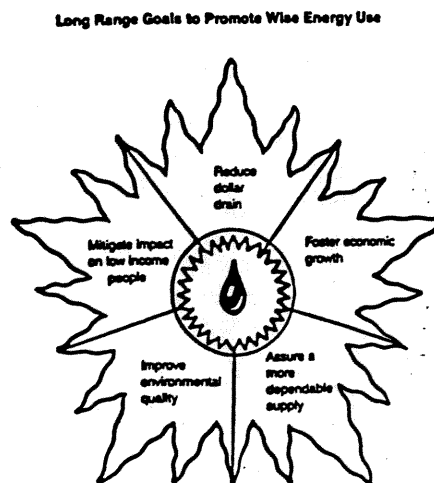
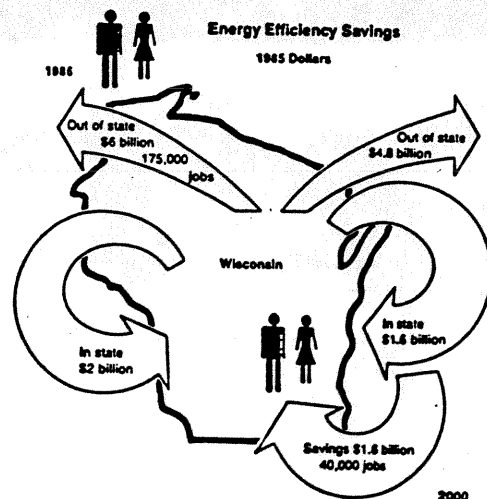
AB 88 enhances Wisconsin's environmental, economic and aesthetic health.

AB 88 is a simple way of increasing the productivity of costly imported energy supplies by squeezing more value out of less electrical energy. Increasing energy's productivity frees up dollars that would otherwise be exported from the state to pay for energy supplies. This enables retailers and homeowners to spend those dollars on goods and services that produce jobs in Wisconsin's economy, or to save those dollars, thus contributing to capital formation.

On the environmental side, efforts to reduce electrical energy production forestall the need for new generating capacity and the related problems of siting and operating generating stations with their waste products. Reduced energy production through conservation has a direct relationship to reduced air emissions of particulate and mercury and acid deposition into our lakes and streams. Particulate air pollution scatters light and further degrades the night sky. Pollution prevention is a first principle.

On the aesthetic front, light pollution is offensive to neighbors and destructive of night sky viewing. The spectacular view the sky offered our ancestors on dark clear nights is lost forever. The glow of urban centers and suburban and rural developments have overwhelmed the stars with their glow. Family outings to view comets, stars and planets are not always possible from the backyard anymore. Light pollution limits the opportunities for amateur and professional astronomical research which cannot be overcome by purchase of more sophisticated equipment.

Citizens for a Better Environment, Madison Audubon Society, the Sierra Club and Wisconsin's Environmental Decade urge this Assembly Committee to recommend adoption of AB 88 to the full Assembly. Thank you for this opportunity to share our viewpoint. Also, we have attached a publication of the International Dark-Sky Association, "Some Lighting Myths." For more information please contact, Caryl Terrell, SC-JMC 608-256-0565.



Graphics from Governor's Energy Efficiency Plan, State of Wisconsin, Oct. 1986.

Testimony prepared for Assembly Bill 88,
"Dark Sky and "Energy Saving" Legislation
by The Energy Center of Wisconsin
Public Hearing March 25, 1997

Our names are Rich Hackner, Associate Director, and Richard Hasselman, graduate intern with the Energy Center of Wisconsin. The Energy Center is a private, non-profit organization whose mission is to sponsor and conduct research in efficient use and management of energy and to develop demonstrate and transfer the results of that research to Wisconsin's energy service consumers and providers.

We believe that the proposed legislation complements our mission by emphasizing energy efficiency and consumer benefits. Further, we endorse the concepts and goals of the proposed legislation to achieve "a cost effective improvement in the energy efficiency of outdoor lighting."

Upon review of the proposed legislation there were several observations that we offer for the Assembly Committee on Urban and Local Affairs to consider:

There are two primary purposes to the proposed legislation: improving energy efficiency in outdoor lighting and preventing or reducing the levels of light pollution. We would like to discuss each of these issues separately.

Efficiency standards for exterior lighting already exist within the ASHRAE 90.1 Building codes. This industry standard applies to new commercial facilities. Indeed, our own state building code (ILHR Section 63.40, Subchapter V) makes use of the 90.1 maximum power level allowances and calculation procedures. Thus, the State is currently regulating the energy efficiency of outdoor lighting within new commercial construction. The proposed legislation is intended to extend to all forms of outdoor lighting and provisions to include existing lighting applications.

By virtue of the exterior lighting rules, there already exists a method which the proposed legislation can reference. Further, as technology changes and more efficient forms of lighting become available, the State has a convenient means to change the legal limits of outdoor lighting power allowances.

The existing rules, however, only cover the exterior lighting power limits, they do not address the issue of preventing or reducing the levels of light pollution. The National Lighting Product Information Program (NLPPI), a program that Wisconsin participates via the Energy Center) defines light pollution, or in their words "light trespass," as "the objectionable intrusion of light into a space ... either directly projected from a luminaire or reflected upward from nearby objects..." NLPPI recommends that to

minimize light trespass that light output be limited at high angles (>75 degrees) with respect to vertical. (Reference: NLRIP Specifier Report, Volume 1, Issue 4, "Parking Lot Luminaires")

We believe that the legislation does offer an opportunity to improve the energy efficiency of outdoor lighting and reduce light pollution. Wisconsin can look forward to the benefits that this energy efficiency legislation will provide. Further, we appreciate the opportunity to provide feedback on this important legislation.

Eskeitz, Anne

From: Greg Furtman[SMTP:gfurtman@Spacestar.Net]
Sent: Wednesday, April 16, 1997 2:35 PM
To: Eskeitz, Anne
Subject: Assembly Bill 88

Anne, Here is a copy of the letter that I emailed to Rep Gunderson.

Dear Representative Gunderson,

My name is Greg Furtman and I live in Northwestern Wisconsin between Webster and Spooner. I am an amateur astronomer and the Observatory Director at UW Center-Barron County in Rice Lake. I am writing in support of some sort of legislation to regulate outdoor lighting. I would like to state that I am not opposed to outdoor lighting, just poor (stupid) lighting. I would also like to pass on the beauty of the night skies to future generations.

I live in the country and am finding that as the population increases in my area so is the light pollution. With almost every new building that goes up, an unshielded mercury vapor or high pressure sodium vapor light also goes up. The worst offenders seem to be car lots and gas stations. For example, at the campus in Rice Lake where the observatory is located, a new car dealership was built to the northwest about a mile away. It is overlit and none of its lights are shielded and now the entire sky in that direction is washed in light, making it very difficult to show the public that attend my observing sessions anything in that portion of the sky. About 1/2 mile to the east a Farm & Fleet recently remodeled and its new lights wash out the eastern sky.

What I would like to see is some kind of standards set for using fully shielded lights in instances like this. A fully shielded light is nothing more than a light that has a fixture around it that directs the light onto the ground where it is needed and not into the sky or off to the sides where it shines onto other people's property (light trespass). There are many types of this kind of light available. I would also like to see that power companies also use this sort of light when they install security lights at peoples homes, cabins, businesses, and other property. (If lights really stopped crime, all the big cities would be very safe places to be.) If you look into it, there is really no good reason why we can't have well lit cities and towns and still have dark skies. In my area tourism is the main economic source, and people from large cities are amazed at how dark our skies are, how many stars there are, and how beautiful it is. I'd like to somehow keep it that way .

Aside from the benefits to the night skies, there are other good reasons for intelligent lighting. If 50% to 75% of a light fixture's light is wasted lighting up the sky, that same amount of coal/oil is wasted. This means we have unnecessary air pollution. If it takes a 250 watt unshielded light to light an area, you could probably get by with a 125 watt light in the proper light fixture with a reflector to get the same amount of illumination on the ground. We are also wasting tax dollars that could be used for better purposes. Also, studies show that poor night lighting interferes with migrating birds and kills tens of thousands of them annually.

There is now all sorts of information available about good lighting. Many states and communities are passing lighting laws. I would like to see Wisconsin as one of the leaders in this area. One good source to contact for more information both about lighting and lighting laws being passed around the country would be the International Dark-Sky Association (The IDA, of which I am a member.) They can be reached at: 3545 N. Stewart,

Tuscon, AZ 85716. They also have an Internet site at <http://www.darksky.org>
Thank you for taking the time to read this and I would ask that you share
my letter with the rest of the Assembly Committee on Urban & Local Affairs.

Sincerely,

Gregory J Furtman
27426 County Rd H
Webster, WI 54893
(715) 635-7928
Greg Furtman
Furtman Woodwork & Design
27426 County Rd H
Webster, WI 54893
(715) 635-7928
gfurtman@spacestar.net

Custom woodworking, including cabinets, furniture, & millwork.

Eskeitz, Anne

From: Rindfleisch, Kelly
Sent: Friday, April 18, 1997 10:01 AM
To: Eskeitz, Anne
Subject: RE: Assembly Bill 88 - Dark Sky Bill

The usual procedure we follow is to gather all the correspondence we receive and distribute copies of everything a couple of days before an executive session on that bill. As no executive session has been scheduled for AB 88, we have not distributed the correspondence on that bill yet. If you would like, I have a distribution list on the e-mail for the committee. If you would forward the letter to me, I can send out an e-mail pretty easily.

From: Eskeitz, Anne
Sent: Friday, April 18, 1997 9:51 AM
To: Rindfleisch, Kelly
Subject: RE: Assembly Bill 88 - Dark Sky Bill

Jim was contacted by a Greg Furtman of Webster, WI, who sent us a copy of a letter he sent to Rep. Gunderson about AB 88. In that letter he asked Rep. Gunderson to share his letter with the members of the Assembly Committee on Urban & Local Affairs. I need to know if this letter was sent to the members of the committee. If not, he E-mail us a copy and asked that we distribute it. Thanks. Anne Eskeitz, Rep. Jim Baumgart's Office.

**ENERGY CRUNCH IS HERE!
BAUMGART ASKS COMMITTEE TO
TAKE ACTION ON HIS ENERGY SAVINGS
LEGISLATION, ASSEMBLY BILL 88**

**Jim Baumgart
State Representative
Sheboygan, WI 53081**

FOR IMMEDIATE RELEASE

May 9, 1997

Considering the predicted energy shortage in Wisconsin this summer, Representative Jim Baumgart (Sheboygan) asked the Assembly Committee on Urban and Local Affairs to review and act upon Assembly Bill 88, relating to the regulation of outdoor light fixtures and bulbs or lamps used in outdoor light fixtures. The intent of the legislation, introduced by Baumgart in February, promotes energy savings through the wise use of nighttime lighting. The committee has taken no action on the bill since a public hearing on March 25.

In testimony at the hearing, Baumgart said that Wisconsin is an "energy poor state". It needs to make every effort to improve its energy conservation standards. A good example is Arizona. That state enacted legislation enabling cities and counties to adopt outdoor lighting control ordinances with all counties and most cities doing so. A lighting ordinance in Tucson has been in effect for almost 20 years and the city has won several energy savings' awards due to its improved lighting, new and retrofitted.

A statement put out by the International Dark-Sky Association, of Tucson, Arizona, sums it all up -- "Quality lighting will give us all a more efficient, safer aesthetic nighttime environment. We also save a great deal of energy and money by using the light, not wasting it. We all win!" For astronomers, Assembly Bill 88 has an added benefit in that improved lighting would limit diffused skyward reflection and darken the sky by controlling light loss and improving the view of the sky.

In a recent letter to Representative Scott Gunderson, Chair, of the Committee, Baumgart pointed out that Wisconsin utilities have painted a bleak scenario for the summer. The energy shortage could result in power being shut off first to businesses and then to residential customers. The result of temporary blackouts will hurt businesses in this state, resulting in lost production, wages and profits. Some Wisconsin companies are considering transferring work to plants in other states to avoid lost production.

He also wrote, "This is an opportune time for the committee to take a step forward on energy savings and that can be done by your review and action upon the legislation presented to you as Assembly Bill 88."

According to Baumgart, the Kohler Company, located in his Assembly District, recently expressed concern about possible energy blackouts and complained about the failure of utilities to bring the nuclear plants back on line. Like every other industrial and residential power user, Kohler has seen an increase in rates because of the problems at the plants. Mike Potts, Supervising Engineer for the Kohler Company, recently stated, "If we are interrupted any more than normal, we will incur loss in production, which translates to loss in revenues, which translates to loss in earnings."

Eskeitz, Anne

From: Eskeitz, Anne
Sent: Wednesday, May 14, 1997 4:45 PM
To: 'Kevin Zimmermann'
Subject: Legislation -- Baumgart's "Dark-Sky" Memo referred to in prior fax

Baumgart's FAX No. 608-282-3626
E-Mail Address: Rep.Baumgart@legis.state.wi.us.

May 13, 1997

M E M O

TO: INTERESTED & CONCERNED CITIZENS
FROM: REPRESENTATIVE JIM BAUMGART
RE: STATUS OF "DARK SKY" and "ENERGY SAVING" LEGISLATION
1997 ASSEMBLY BILL 88

On March 25, Assembly Bill 88 (AB 88) received a public hearing before the Assembly Committee on Urban & Local Affairs. Unfortunately, the bill was the last one on the agenda that day and it was very late in the afternoon before testimony was heard. By that time, the committee was tired and some people who came to Madison to support the bill had to leave before testifying.

To date, Representative Scott Gunderson, Chair of the Urban and Local Affairs Committee, has not scheduled a committee vote on AB 88. This vote is the next step to move the bill forward through the legislative process.

On May 9, I wrote to Rep. Gunderson asking him to take further action on the "Dark Sky" Legislation. In that letter, I referred to the predicted energy shortage in Wisconsin this summer and pointed out that this would be an opportune time for the committee to take a step forward on energy savings by acting on Assembly Bill 88. A copy of the letter was sent to all committee members.

Enclosed are: 1. A copy of my recent press release on Assembly Bill 88. 2. A copy of the committee record showing appearances and/or registrations at the public hearing.

In February, I sent you a notice of the hearing date and a list of the committee members. Many of you contacted them then to express your support. I believe it's time to write the Chair and members again, urging action on Assembly Bill 88.

If you need further information, please feel free to contact me.

***Note:** The phone number for Rep. John Lehman was incorrect on the list. It should be 608-266-0634.

May 27, 1997

Pat Dobrinska
W1555 Cty Tk J
Green Lake, WI 54941

Dear Pat:

Thank you for contacting me about Assembly Bill 88, relating to the regulation of outdoor light fixtures and bulbs or lamps used in outdoor light fixtures.

Enclosed please find:

- Copy of Assembly Bill 88.
- History of Assembly Bill 88.
- Assembly Committee on Urban and Local Affairs - Committee Proceedings, showing appearances and registrations at the public hearing (both for and against).
- List of Members of Urban & Local Affairs Committee.
- Copy of Press Release, dated May 9, 1997.

Your name will be added to my list of people interested in Assembly Bill 88, the "Dark Sky" Legislation.

Sincerely,

Jim Baumgart
State Representative
26th Assembly District

JB:ae
Enclosures



If you have questions regarding privacy, please [read this](#).

Name	Address	Phone
Pat Dobrinska	W1555 Cty Tk J, Green Lake, WI 54941	(414)294-6804

Search Again

© 1997 MetroMail Corp.

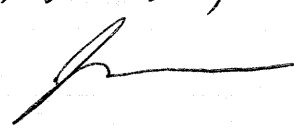
Results by 

*Copyright © 1996-7 Yahoo! All Rights Reserved.
Copyright MetroMail Corp. © 1996
Questions? Please see our [FAQ](#) and our [disclaimer](#).*

ANNE:

5-20-97

we have another "Dance
Sky supporter". please
send her a copy of the
bill, COMMITTEE MINUTES
(those who supported or opposed)
+ short letter.

MARK


♀

PAT DOBRINSKA
W1555 HWY J
GREEN LAKE, WI 54941
~~HE~~ 414-294-6804