



SUSTAINABLE LIGHTING PRODUCTS

**ENERGY USE AND TOXIC CONTENT-
CHOICES FOR SUSTAINABILITY**

Paul Walitsky

North American Environmental Affairs Manager

SUSTAINABLE LIGHTING

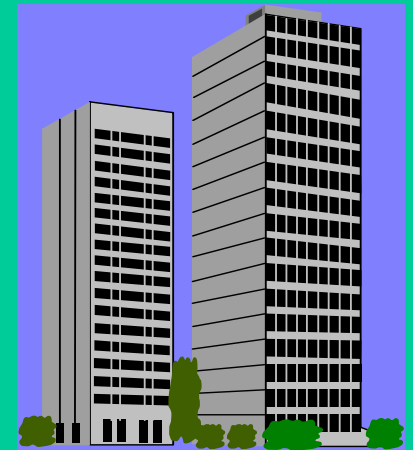
Philips *Alto Lamp* is very energy efficient and contains the lowest mercury levels.

Why is this important to State Energy Offices?



SUSTAINABLE LIGHTING

- LIGHTING CONSUMES ABOUT 40-50% OF ENERGY USE IN TYPICAL OFFICE BUILDING
- SUSTAINABLE PRODUCTS MEASUREABLY REDUCE GLOBAL WARMING GASES



SUSTAINABLE LIGHTING

- ENERGY USE FOR OPERATION USES 640 KWH
- EUROPEAN WORK SHOWS THAT ENERGY FOR MANUFACTURE IS ABOUT 7% OF OPERATIONAL ENERGY (~45 KWH)
- DISPOSAL TAKES ABOUT 3% OF OPERATIONAL ENERGY (~19 KWH)

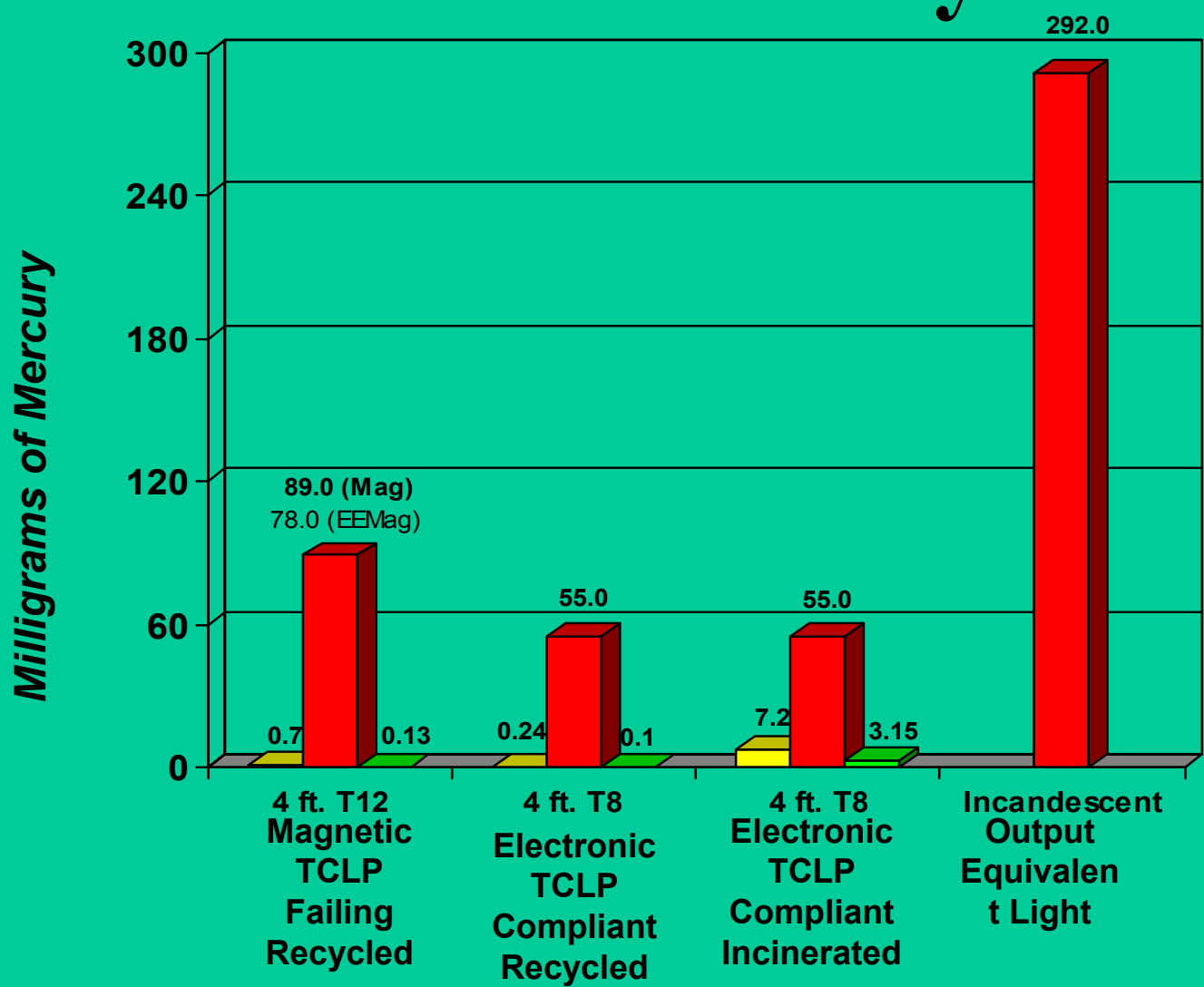


SUSTAINABLE LIGHTING

- RESULTS OF EUROPEAN LCA MAY USE DIFFERENT FACTORS, i.e. FUEL MIX, PACKAGING DIFFERENCES ETC.
- THE EFFECTS OF ENERGY EFFICIENCY ARE SO OVERWHELMING THAT NO MATTER WHAT ELSE WE LOOK AT ENERGY EFFICIENCY REMAINS DOMINANT.



Lifetime Mercury Emissions*



KEY

- Hg Released During Disposal
- Hg Released From Power Generation
- Hg Rel ALTO

CONCLUSIONS

- *Hg from lamp disposal is small compared to Hg released from power generation required to operate lamp*
- *Incandescent lamps contain no mercury but result in the highest Hg emissions*

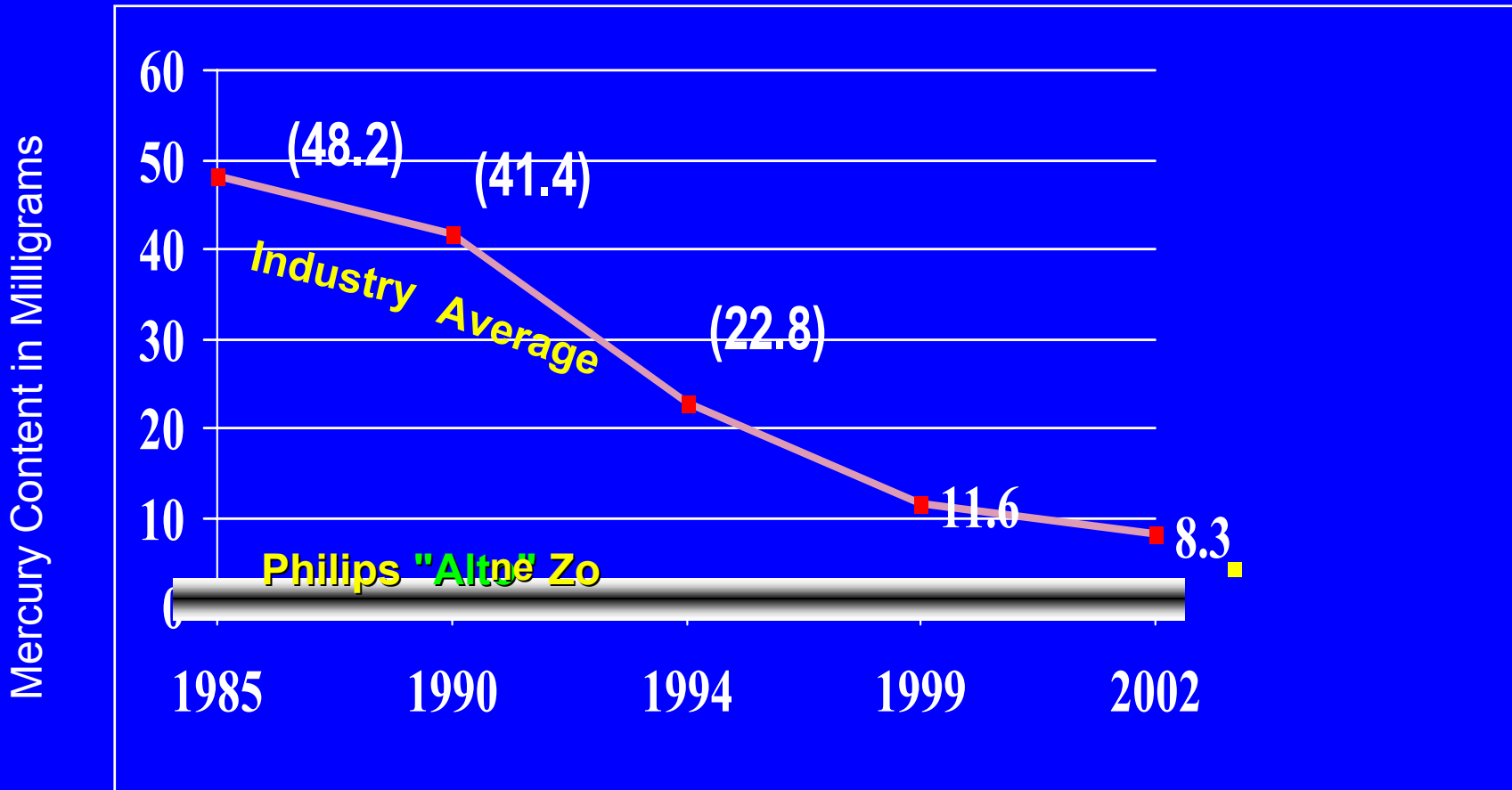
*Based on 20K burning hours, Hg content of 23 mg per T12 lamp, and 8 mg per T8 lamp. Hg content of fuels is the US weighted average for fossil and non-fossil fuels, calculated from "Environmental and Health Aspects of Lighting: Mercury" J.IES 1994. Disposal emissions assume 3% in residuals of recycling, 90% from incinerators.

SUSTAINABLE LIGHTING

How does your low mercury
energy efficient lamp
compare to conventional
lamps on the market?



SOLUTION - Alto



: Philips Lighting Company and the National Electrical Manufacturers Association, based on the study of standard four-foot, 40-watt T-12 fluorescent lamps



US Green Building Council

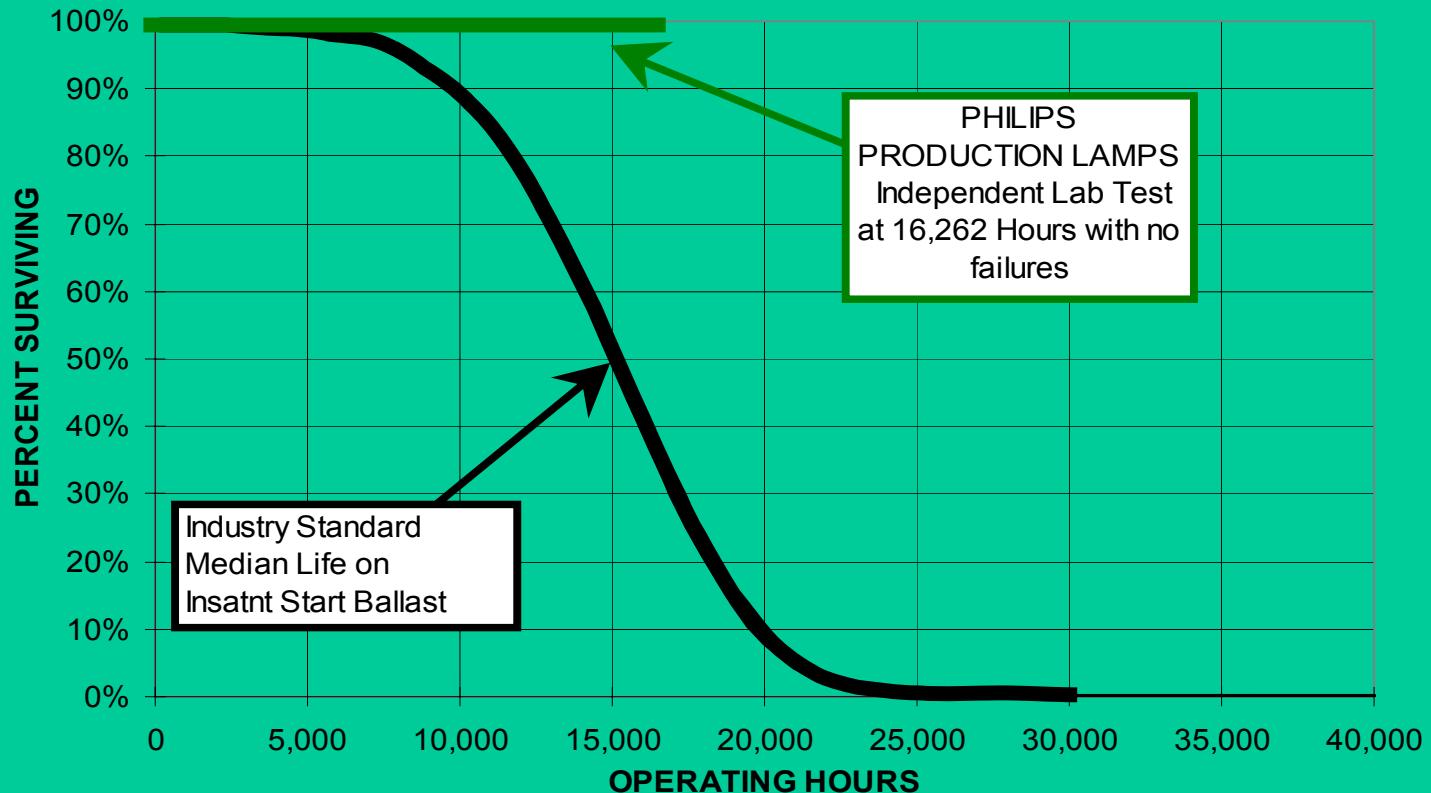
- Nationwide non profit developing
- Standards for “Green Building Design”
- Energy Efficiency
- Site Design
- Recycling & Recycled materials
- Use of Green materials

US Green Building Council

- Leadership Excellence in Environmental Design (LEED)
- LEED-Existing Buildings
- Waste Management Module Prerequisite
- Mercury to average below 25 ppm in lighting products

T8 PHILIPS ALTO Fluorescent Lamps

Mortality Curve - Weibull



Life testing **ONGOING** at **INTERTEK TESTING SERVICES**
certified to ISO 9001, using IES LM40 approved life testing methods

Rev.7 updated May 30, 2002

SUSTAINABLE LIGHTING

- INCANDESCENT LAMPS 10-15 L/W
- HALOGEN LAMPS 15-20 L/W
- FLUORESCENT LAMPS 70-100 L/W
- MERCURY VAPOR 60-70 L/W
- HIGH PRESSURE SODIUM
& METAL HALIDE 80-110 L/W
- LOW PRESSURE SODIUM 200 L/W



SUSTAINABLE LIGHTING

- USE MOST EFFICIENT LIGHTING CONSISTENT WITH APPLICATION
- HALOGEN OR COMPACT FLUORESCENT FOR INCANDESCENT
- T-8 LAMPS FOR T-12 (electronic ballasts for electro-mechanical)



SUSTAINABLE LIGHTING

- Halogen lamps contribute to sustainability by longer life & increased efficiency.
Halogen lamps are a “bulb within a bulb”
Increase in heat not a factor
- Life increased by factor of 2-3
- Packaging Reduction
- Shipping reduction
- Materials reduction



SUSTAINABLE LIGHTING

Can you discuss some of the life cycle effects of Philips products and what that means to consumers?



SUSTAINABLE LIGHTING

- FLUORESCENT ENERGY EFFICIENT LAMPS LOWEST MERCURY AT 3.5 MG
- MEETS CALIFORNIA NONHAZARDOUS STATUS (<20 ppm Hg)+OTHER TESTS
- QL-INDUCTION LIGHTING 100,000 HRS LIFE (reduces disposal & maintenance)
- T-5 SMALLER BULB SAME EFFICIENCY



Philips QL Induction System

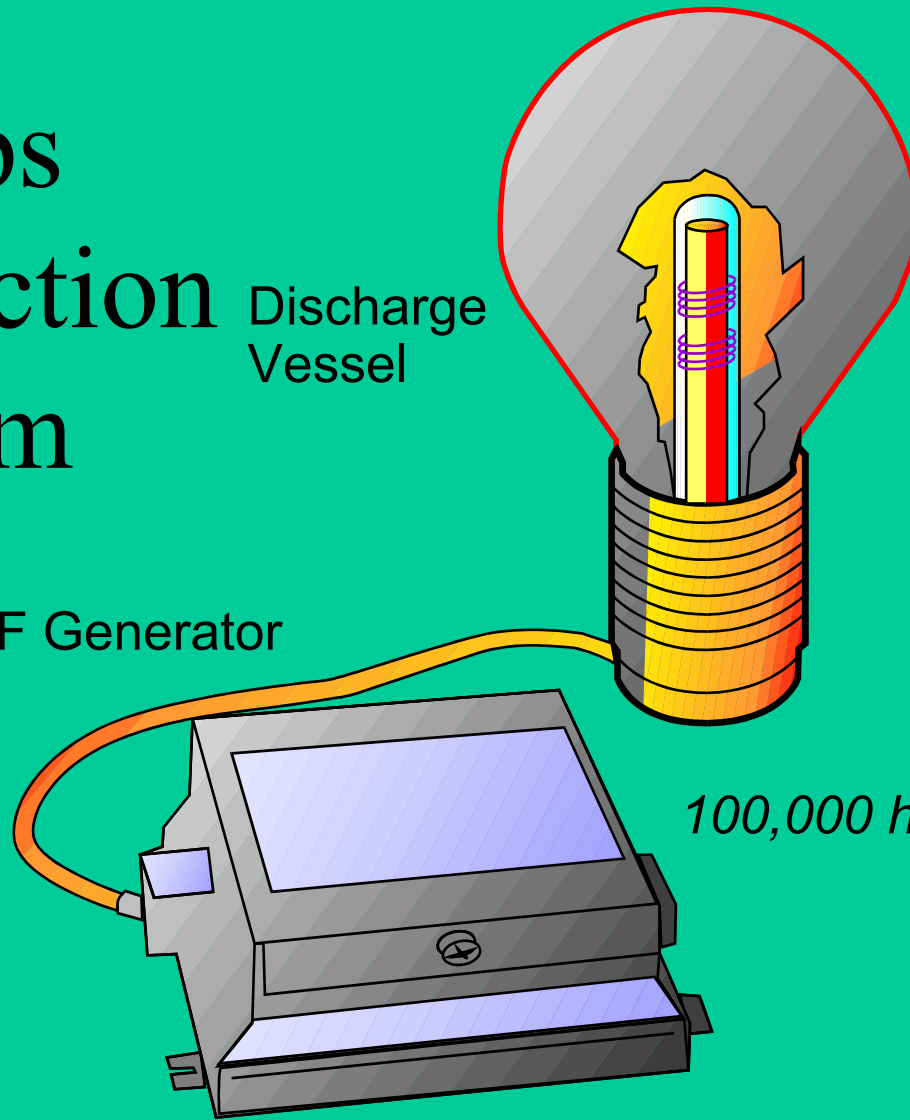
Discharge
Vessel

Power
Antenna

HF Generator

100,000 hours life

55W - 3500 lm
85W - 6000 lm
165W - 12000 lm



SUSTAINABLE LIGHTING

For Philips, what are the most important life cycle factors for consumers when choosing lamps?



The Philips Lighting Formula

An Energy Blueprint for the Nation

What is the *Philips Lighting Formula*—
An Energy Blueprint for the Nation?

As part of a national energy conservation initiative, Philips Lighting Company relamped Berkeley businesses and residences on Telegraph Avenue between Channing and Durant streets with energy-efficient light bulbs. The retrofit of this city block serves as a blueprint for the rest of the country, proving how simple it is to place energy-efficient practices into your home or business.

11 stores and 41 apartments

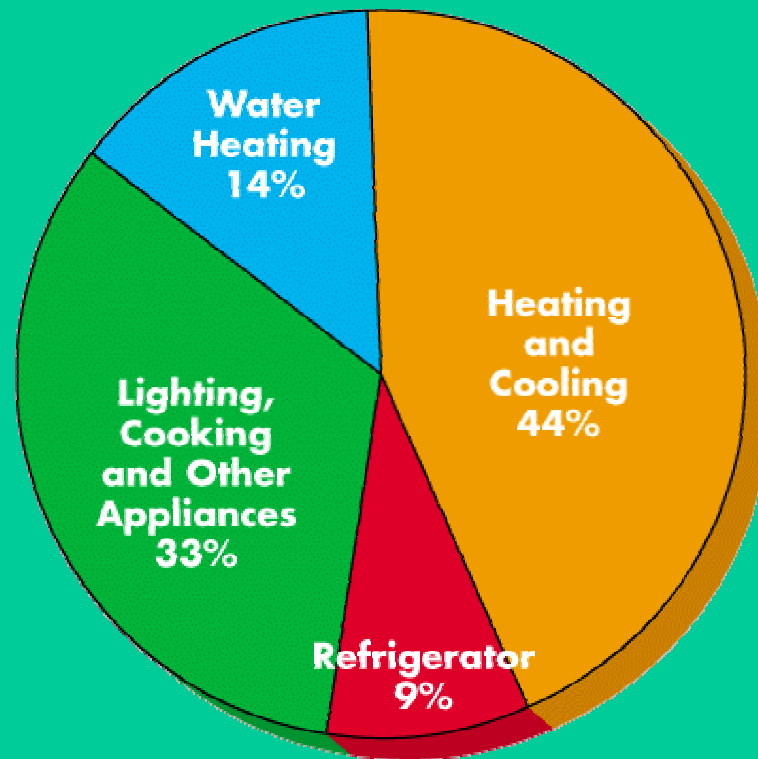
The Philips Lighting Formula

An Energy Blueprint for the Nation

How was this Executed?

- 1) Lighting Audit-Lawrence Berkeley Laboratory
Consent forms-Neighborhood association**
- 2) Lamps -Donated by Philips Lighting**
- 3) Installation-Donated by Amtech Lighting**
- 4) Recycling-Donated Earth Protection Services**
- 5) Follow-up Audit -Lawrence Berkeley**

Top Energy Offenders For The Home



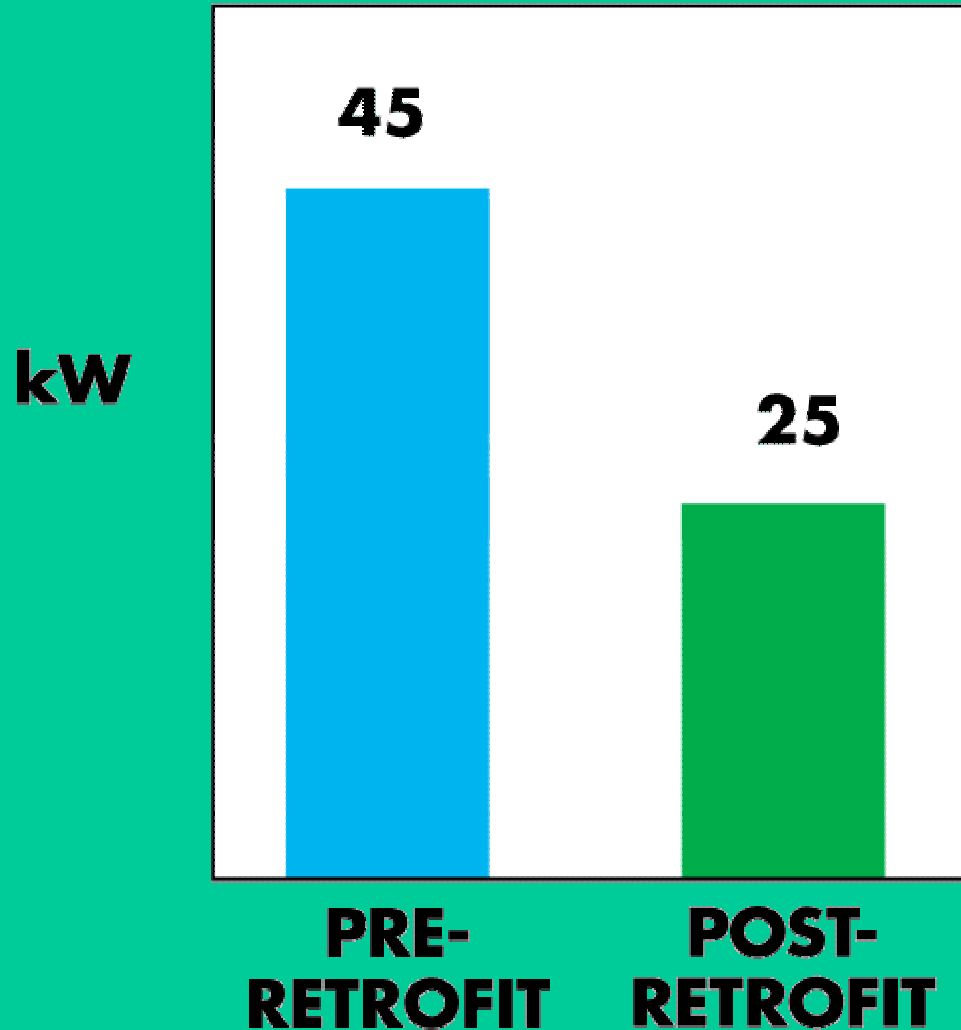
Lighting Falls into the Second Largest Energy Offender Category

* Source: Energy Star

The Philips Lighting Formula How One Block in Berkeley Will Impact the Energy Crisis

Current Energy Consumption	Post-Retrofit Consumption	Energy Savings
45 kW	25 kW	20 kW
147,800 kWh/yr	85,142 kWh/yr	62,712 kWh/yr
\$20,692 Annually	\$11,920 Annually	\$8,772 Annually

One Block In Berkeley



45%
Power Saved

Sustainability Support Programs

- EcoVision World Wide Program
- EcoDesign Products
- Partner-Rebuild America
- Ally & Partner in Energy Star
- Business Partner Flex Your Power
- Board Member New Jersey Sustainable Business Alliance
- Institute for Market Transformation to Sustainability



SUSTAINABLE LIGHTING



MasterColor®



Masterline™



Marathon™



ALTO®



PHILIPS
Halogená®



SUSTAINABLE LIGHTING

- ASSEMBLY OF ENERGY EFFICIENT FLUORESCENT LAMP USES 5.0 KWH (including manufacture of glass). OTHER COMPONENTS ADD ~10 KWH (plus Natural Gas).
- LCA TAKES INTO ACCOUNT ENERGY FOR PACKAGING, TRANSPORTATION, EXTRACTION

