

PHILIPS

sense **and** simplicity

Improving people's lives through
meaningful innovations

Green Lighting

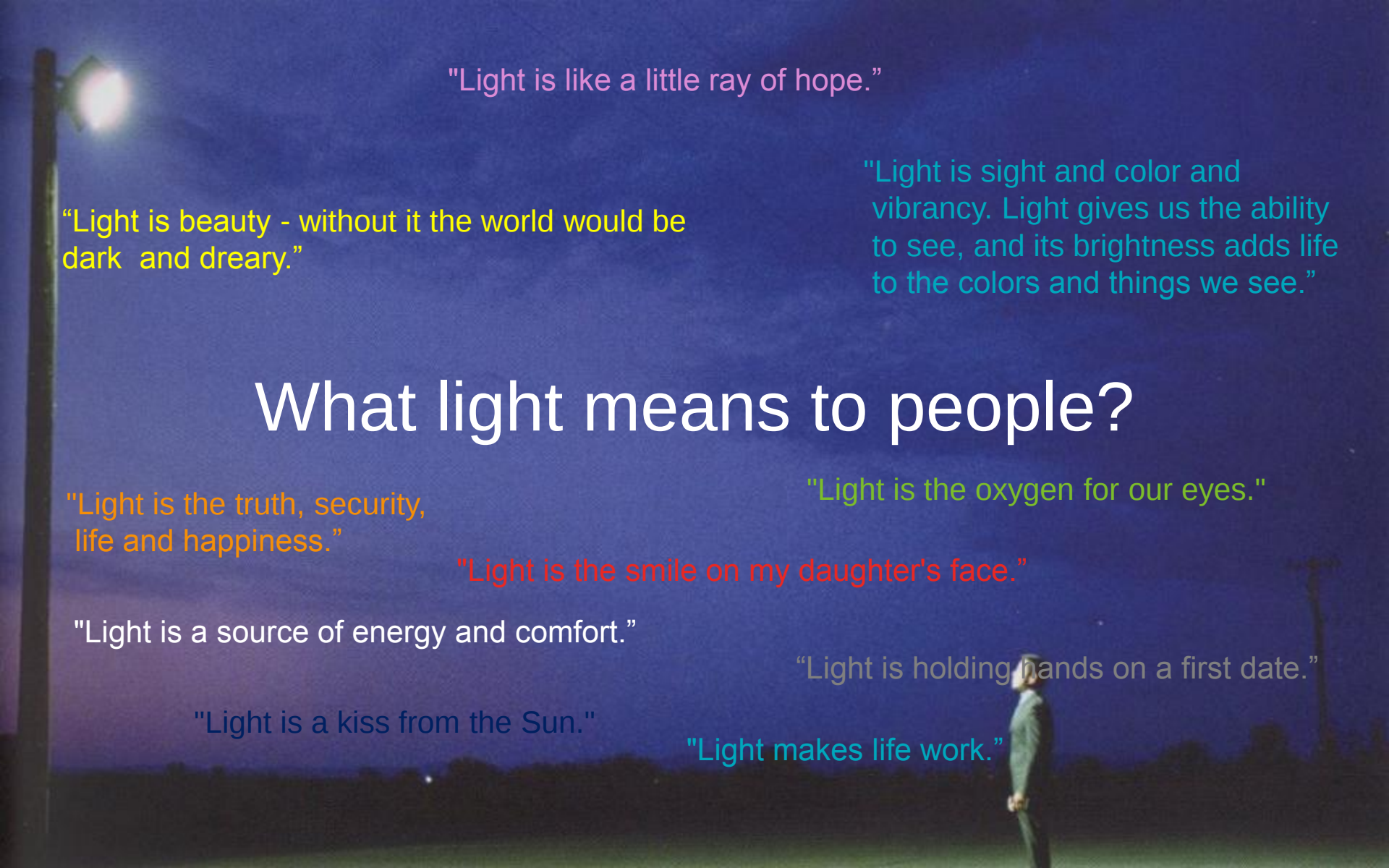
Ashish Bahal, Architect, Lighting Application Services



Content

- Lighting & Green Agenda
- Green Building & Lighting
- Recommended Green lighting solutions
- Green Lighting & Philips





"Light is like a little ray of hope."

"Light is beauty - without it the world would be dark and dreary."

"Light is sight and color and vibrancy. Light gives us the ability to see, and its brightness adds life to the colors and things we see."

What light means to people?

"Light is the truth, security, life and happiness."

"Light is the oxygen for our eyes."

"Light is the smile on my daughter's face."

"Light is a source of energy and comfort."

"Light is holding hands on a first date."

"Light is a kiss from the Sun."

"Light makes life work."

Simply enhancing life with light

The Philips Lighting difference



People focused



Partners in
innovation



Meaningful
solutions

New innovations radically transform
the way we consume energy



Unique, fully-integrated lighting solutions
enable and enhance our lives



Identity and expression can be explored
in entirely new ways with light



We are living in a time where **Energy and Climate Challenges** are increasingly capturing the world's attention.



Facts and Trends – Buildings

- More than 25% of world's **new buildings** are going to be **built in India** within coming 10 yrs.
- People have **longest working hours** in India
- Indian leaders are committed to **reduce carbon** intensity emission
- Adherence to **LEED/ global standards** and its local adaptation –GRIHA, IGBC, GBC
- Being Green is a way to **realize CSR** and to differentiate from competitors





What can we do with lighting?

- 17 - 20% of the world's energy costs are towards Lighting
- More than 80% of current lighting in use in the world is based on antiquated technology which consumes more energy and indirectly causes more CO² emissions
- Even if we convert 20% of the current lighting to energy efficient lighting, we will save nearly 50 Billion Euro globally in energy costs



What can we do with lighting NOW?

- More energy efficient and environment friendly technologies exist than are currently used.
- Latest lighting solutions can help save our environment.
- Hazardous materials in lamps (Mercury) also have to be kept within limits to prevent polluting our ecosystems.
- Energy efficient and environment friendly lighting solutions are not only good for the planet, they also save money.

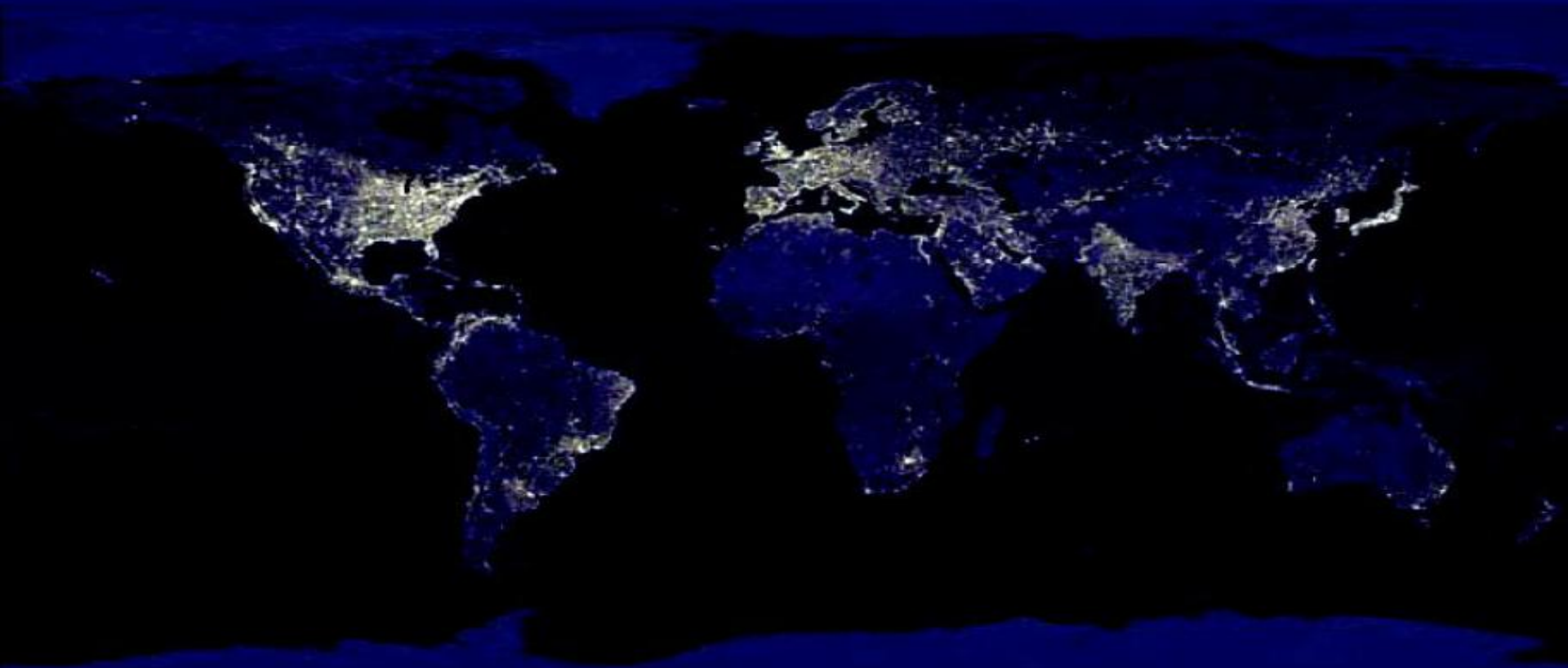
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Lighting, a significant consumer of energy-

Almost 20% of global electricity consumption is used for lighting



Ce

**Turning off the photocopier at the end of the workday
saves 1.2% ⁱⁿ on energy and CO₂ emissions.**

**Switching on energy efficient
lighting saves up to 75%.^{**}**

Cur



Switching computer equipment off at the end of the workday
saves 0.5%* in energy and CO₂ emissions.

**Switching on energy
efficient lighting saves up to 75%.***

Cancel

Shut Down

75%

savings

... an opportunity not to be missed ...

PHILIPS

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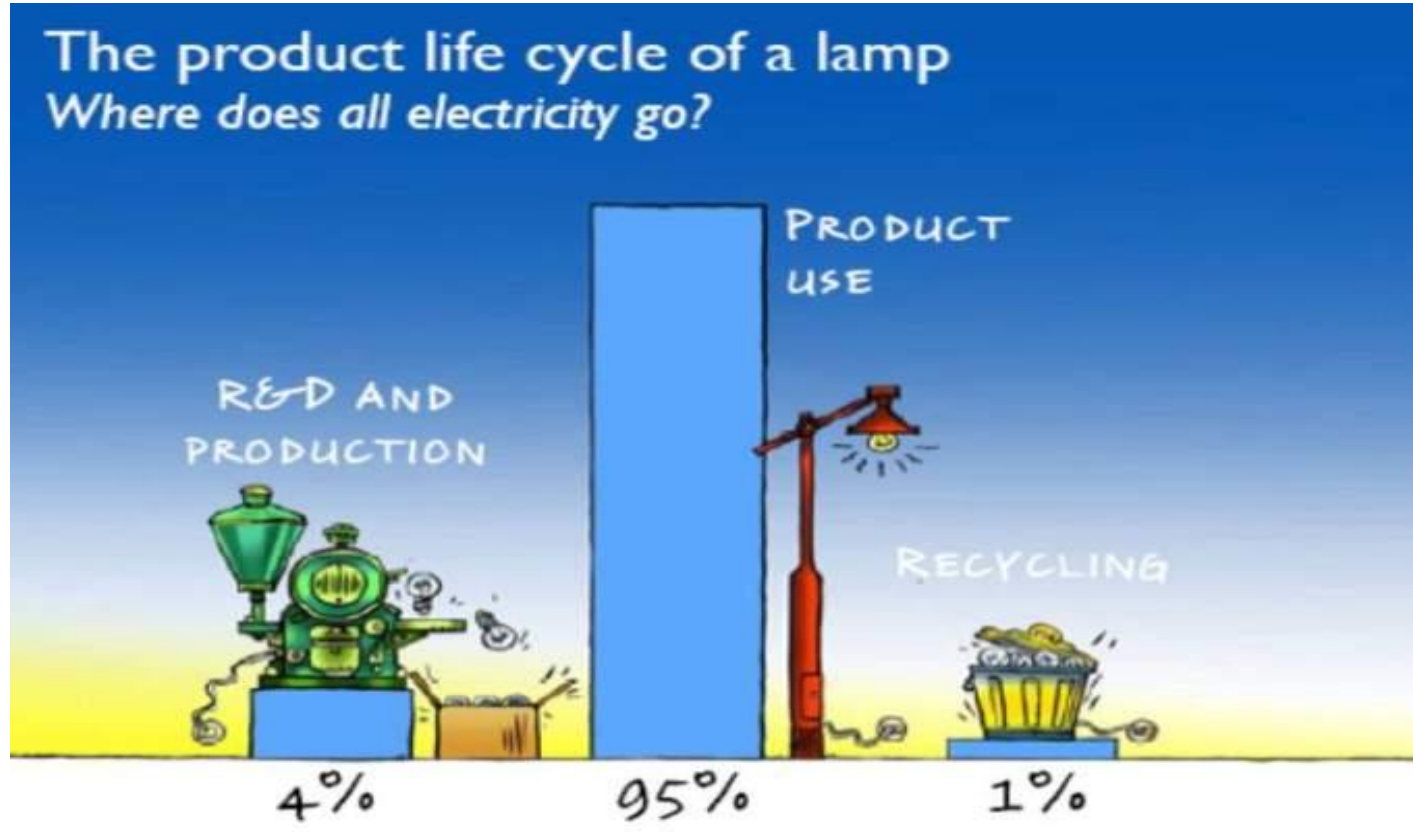
Green Lighting Approach

1. Green Product Approach
2. Efficient Product Approach
3. Energy Saving System Approach
4. Light Pollution Reduction
5. Renewable Energy Approach



Total life cycle impact of lighting

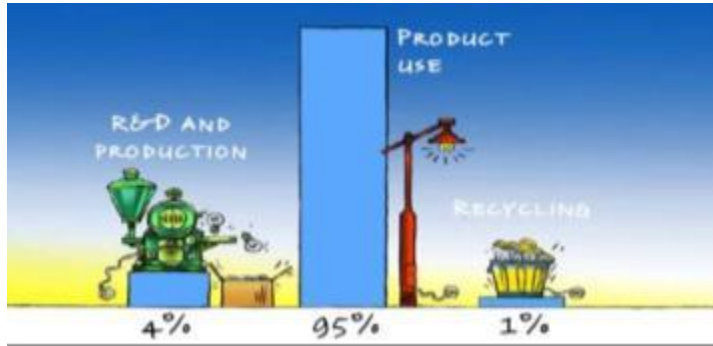
Up to 95% during the user phase



EcoDesign



Life Cycle approach



Energy Efficiency

- 10% less energy usage
- (e.g. efficacy, LOR or total power consumption)

Packaging

- > 10% less packaging in volume or weight

Hazardous Substance

- >10% less weight of one of the substances of the restricted and relevant substance list
- >10% radiation dose reduction

Weight

- >10 % less product weight (incl. accessories), measured in Kg.

Recycling and Disposal

- >10% higher content of material that can be recycled;
- Product that contains > 30% recycled material

Lifetime Reliability

- >10% life time improvement

Philips Green Focal Areas



One or more of our GFAs must be significantly better resulting in a lower total environmental impact.

Life Cycle Analysis of 3 competing technologies

Comparison basis

Number of lamps needed for 25k hr of usage

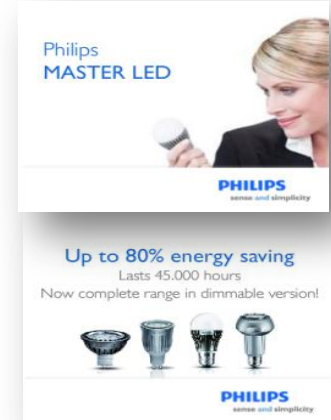
EnduraLED 12W (25k hr)



Twister T2 14W (8k hr)

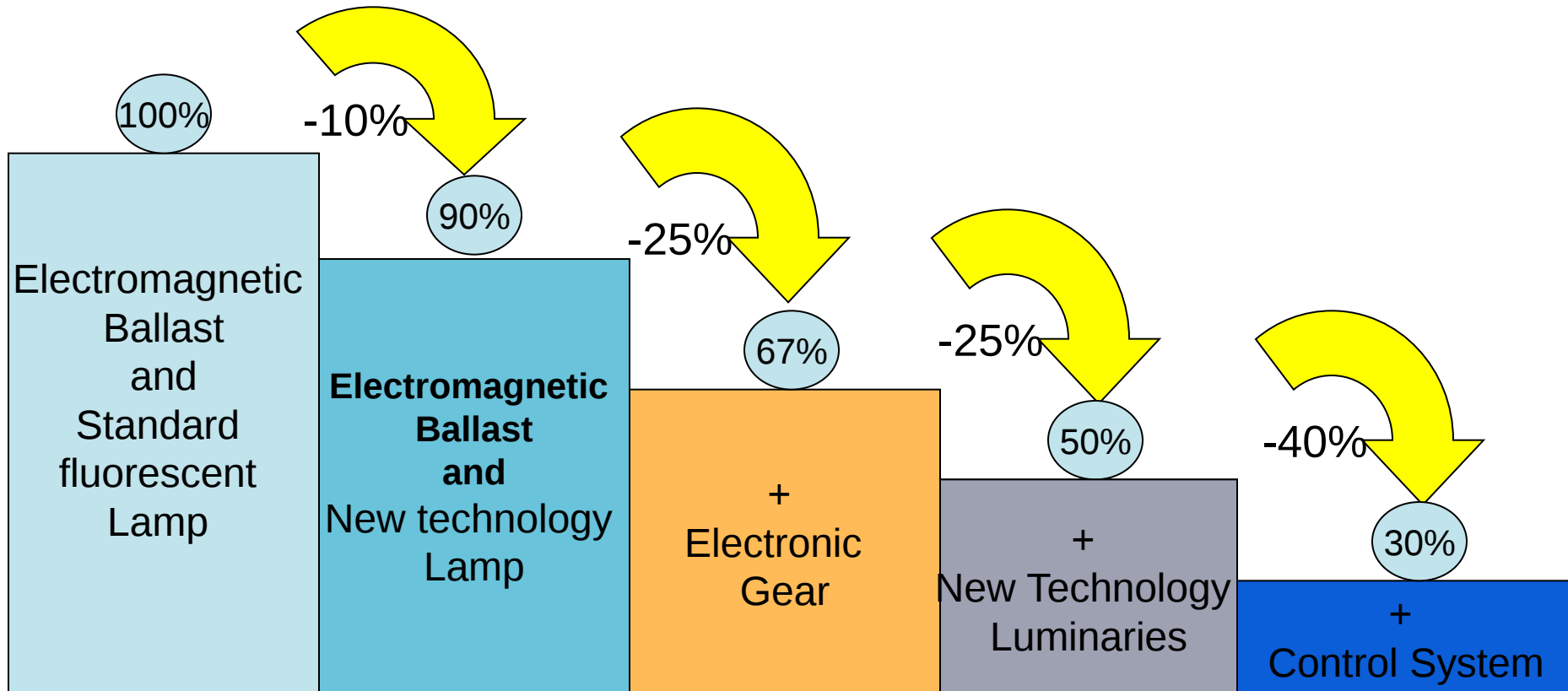


Incandescent 60W (1k hr)



Solutions overview

Possible energy saving in offices by using new technology



Green Lighting solutions

- Total system strategy to reduce lighting energy consumption, incl. efficient lamp, electronic driver, high performance luminaires & LED luminaires
- Controls is a must for earning more Green building points!



Strategy 1+2- Up-lamping + Up-gearing

T5
CDM

- T5 lamps have **low mercury** content over 50% reduction (vs. T8)
- T5 lamps are **22% more efficient** than standard T8 lamp
- New T5 Eco has additional 10% saving vs. T5 ;highest efficacy
- CDM lamps have **low mercury**, no lead
- CDM Elite is available for 20-70W, **2~4 times higher efficiency** than halogen
- **Crisp white light** with excellent colour rendering (Ra 90) and stable colour performance during lifetime
- **Reduce maintenance/** disruption **cost**-Long lifetime 12,000 hrs (avg of 20,000 hrs)



MASTERColour CDM Elite MW



T5 Eco

HFPIII



MASTERColour CDM Elite

Strategy 3- Luminaire efficiency upgrade

- **Upto 25% greener** (CO2 emission reduction)
- **High** luminaire integral **efficacy**
- It offers **15% energy saving**
- **Totally mercury free** - Hazardous material (RoHS compliant)
- **Maintenance free**- Lifetime 50,000
- **High efficiency** LED downlights luminaire
- It offers **50% energy saving** vs. std CFL-I downlights
- **Smaller size** of LED lighting source allow sleek luminaire choices



-



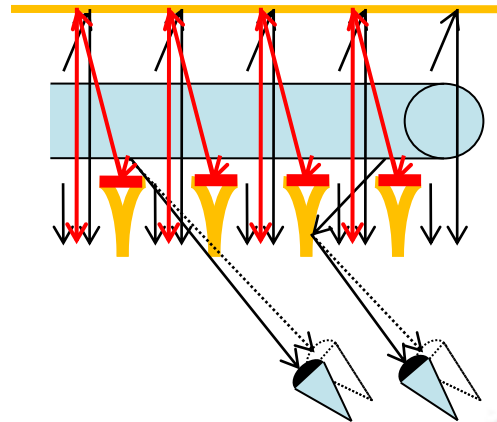
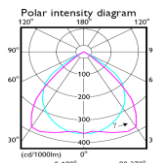
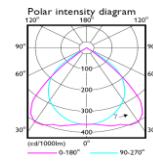
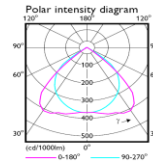
8 series



6 series



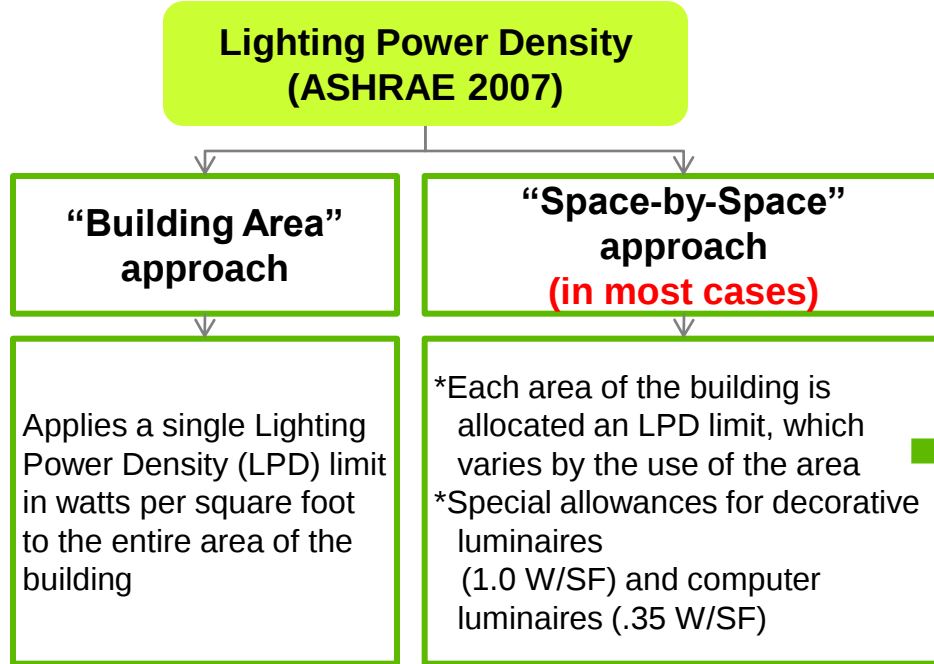
2 series



TBS 869

Lighting Power Density (LPD)

- ASHRAE 90.1-2007 provides guidance of Lighting Power Density (LPD)- the maximum amount of power that can be used for lighting. It varies by the use of the building or the spaces within it.
- Two methods for calculating the LPD-



Office Lighting Power Density under Standard 90.1		
	(W/SF)	Convert (W/sqm)
Space	2007 LPD	2007 LPD
Enclosed office	1.1	11.8
Open office	1.1	11.8
Conference/ Meeting	1.3	14.0
Training	1.4	15.1
Lobby	1.3	14.0
Atrium (1 st three floors)	0.6	6.5
Atrium (additional floors)	0.2	2.2
Corridor	0.5	5.4
Active stairway	0.6	6.5
Active storage	0.8	8.6
Restroom	0.9	9.7
Electrical/ Mechanical	1.5	16.1
Food preparation	1.2	12.9
Dining	0.9	9.7
Laboratory	1.4	15.1
Building area method	1.0	10.8

Strategy 4.1- Apply Lighting Control (<5,000 sqm)

- **Automatic saving-** Lighting are on when needed
- **DALI system** is the most widely used digital control system in the world

Motion detector

- Switch on or dim up when sensing occupants presence
- Up to 30% savings

Lights on when needed



OccuSwitch

Daylight linkage

- Reduce artificial lighting when daylight is sufficient
- Up to 30-35% savings

Perfect regulation for every area



LuxSense

Daylight integration

- Enable daylight to displace artificial lighting with sensitivity to occupants
- Up to 75% savings

Combination of Daylight & motion detector



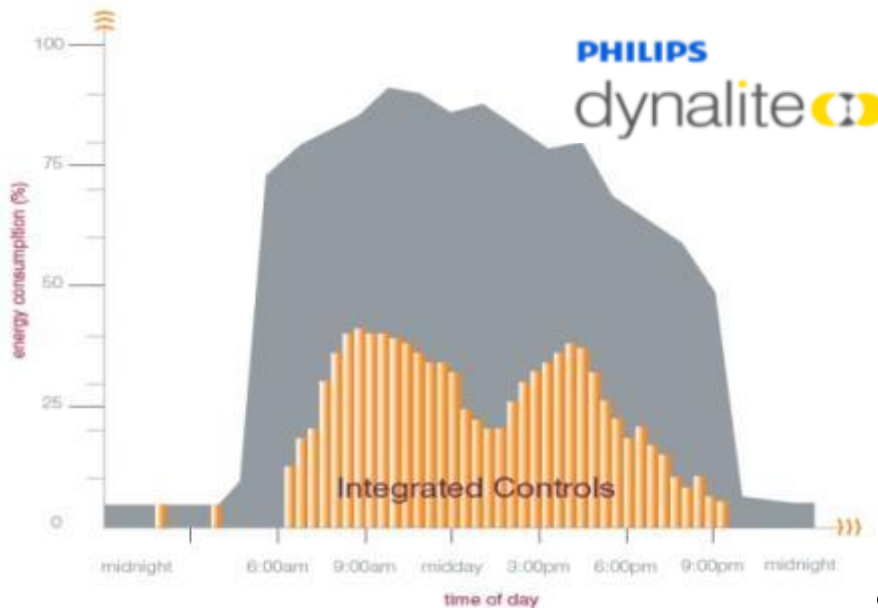
OccuPlus



Actilume

Strategy 4.2- Integrate with Energy Management System (>5,000 sqm; new construction)

- A comprehensive facility-wide **networked control solution** developed specifically for lighting control, for scaling and integrating extensively with HVAC, BMS, security, fire detection, access control, blinds, motors and other electrical loads systems to provide a comprehensive solution.



MapView – Building services control management software



Load control devices



User interfaces

4. Light Pollution Reduction

Uniform Illumination

- Uniformity vs. High Light Levels
- Attempt to maintain max 1.5fc for average illumination.

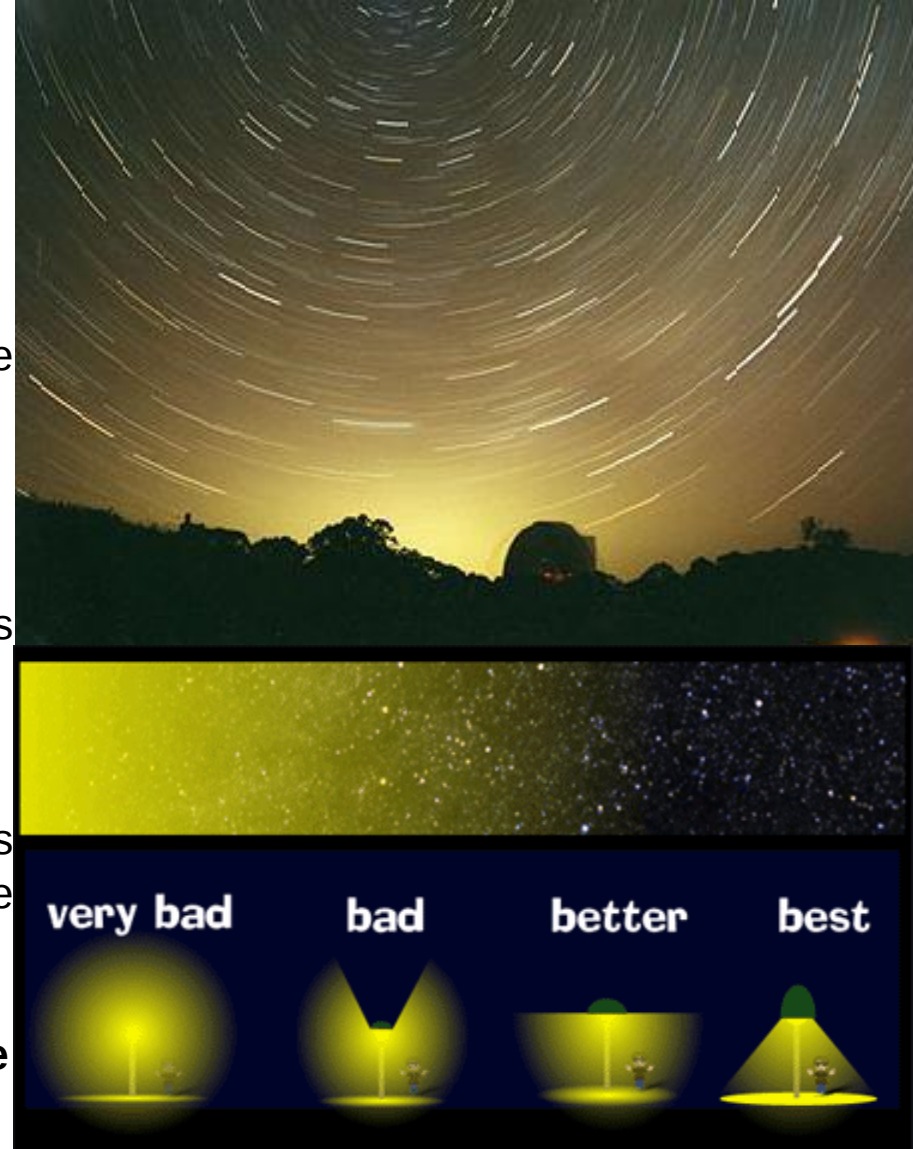
Zero Trespass at Project Boundaries

- Illumination at property lines should be 0fc.
- Exceptions made for areas of high brightness (street adjacency, etc.)

No Up-lighting of Trees, Etc.

- v2.1 allows for minimal up-lighting only in areas of high ambient brightness if all other criteria are met.

Maintain Façade Lighting On The Building Face



Solar Street Lighting System



System Offering

1. LED Solar Street Light with MPPT controller
2. Solar Panel
3. Battery
4. Battery Box
5. Galvanised Pole
6. Pole fixing piece

LEDs have many advantages

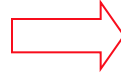
compared to other lighting sources

Conventional lighting sources

- Incandescent
- Halogen
- Fluorescent
- Gas-discharge
(example: neon)



NEON



Light Emitting Diode (LED)



- Advantages of LEDs
 - Long lasting and low maintenance
 - Energy efficient
 - Dynamic (digitally) color control
 - Small (design flexibility)
 - Directed light (= increased efficiency)
 - Robust and vibration proof
 - Turn on instantly
 - No IR and UV radiation in the beam
 - Cool beam of light
 - Low voltage
 - No mercury



Energy
Consumption



Hazardous
Substances



Less
Weight



Recycling
and
Disposal



Lifetime
Reliability

PCK iColor Cove & eW Cove

- iColor Cove MX & eW Cove
 - >Ambient and Lux level improved
 - >Hazardous material reduction/mercury free, apply RoHS



Corridors and stairways



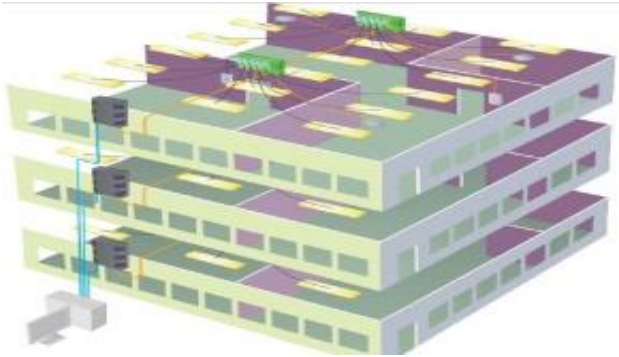
OccuSwitch, LuxSense, OccuPlus & ActiLume

- OccuSwitch is a **movement detector** with a build in switch, can switch any load up to 6A
- **Save up to 30%** of electrical energy by “square zone” presence detection
- Designed for use in office workspaces and similar applications including toilets, storage rooms etc
- LuxSense is the simplest **daylight harvesting control system** equipped with Philips HFR ballast
- Easy to install “Click-on”, real “Plug & Play” solution
- Constant light and **saves up to 30~35%**
- Cost effective, max. 19 lums can be slaved
- OccuPlus is a **combination of daylight** depending regulation, **occupancy control**, **local control** and with optional building management system; **Save up to 75%**
- ActiLume can maximum comfort and energy **saving up to 75%** (in fully automatic mode and when used in combination with Philips HFR and DALI ballast)



Philips Dynalite Lighting control system

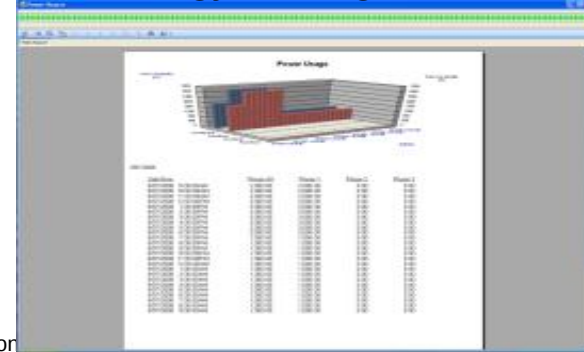
- One building management system to control multiple electronics systems
- Local control from individual user PC's



- MapView – Graphical “Front end” software to report system status
- Power monitoring for great on-time energy management



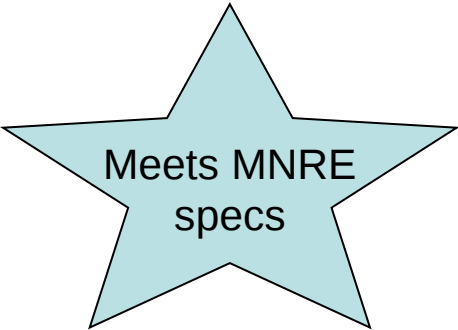
Lighting Application



Solar Street Light System



BRP 202/302



	8W /13 W/ 21 W/ 43 W
System Wattage	8W / 13 W/ 21 W/ 43 W
Lumen Output from fixture	730 lm / 900 lm
Ingress Protection	IP 65
Charge Controller	MPPT
Charge controller efficiency	> 90%
LED driver efficiency	> 90%
Duty Cycle	12 hrs auto
Solar Panel	45Wp / 60 Wp
Battery	40Ah / 60 Ah
Autonomy (battery backup)	3 days
Pole (Galvanised)	4m

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How can Philips serve your agenda?

A partnership designed around you



Focused
on people



Collaborative
innovation



Meaningful
solutions

We create partnerships to
discover the most relevant
approach.

Philips complete lighting solutions toolkit



Assessment of opportunity

- Energy assessment by Philips staff
- Certified ESCO audit

Products & system solutions

- Lighting design/ application support
- The most comprehensive product portfolio
- Installation
- Maintenance

Financial packages

- Financing

What to expect from Philips

