



GREEN LIGHTING
&

LIGHTING EDUCATION



Dr. Prakash Barjatia, FISLE

Chairman

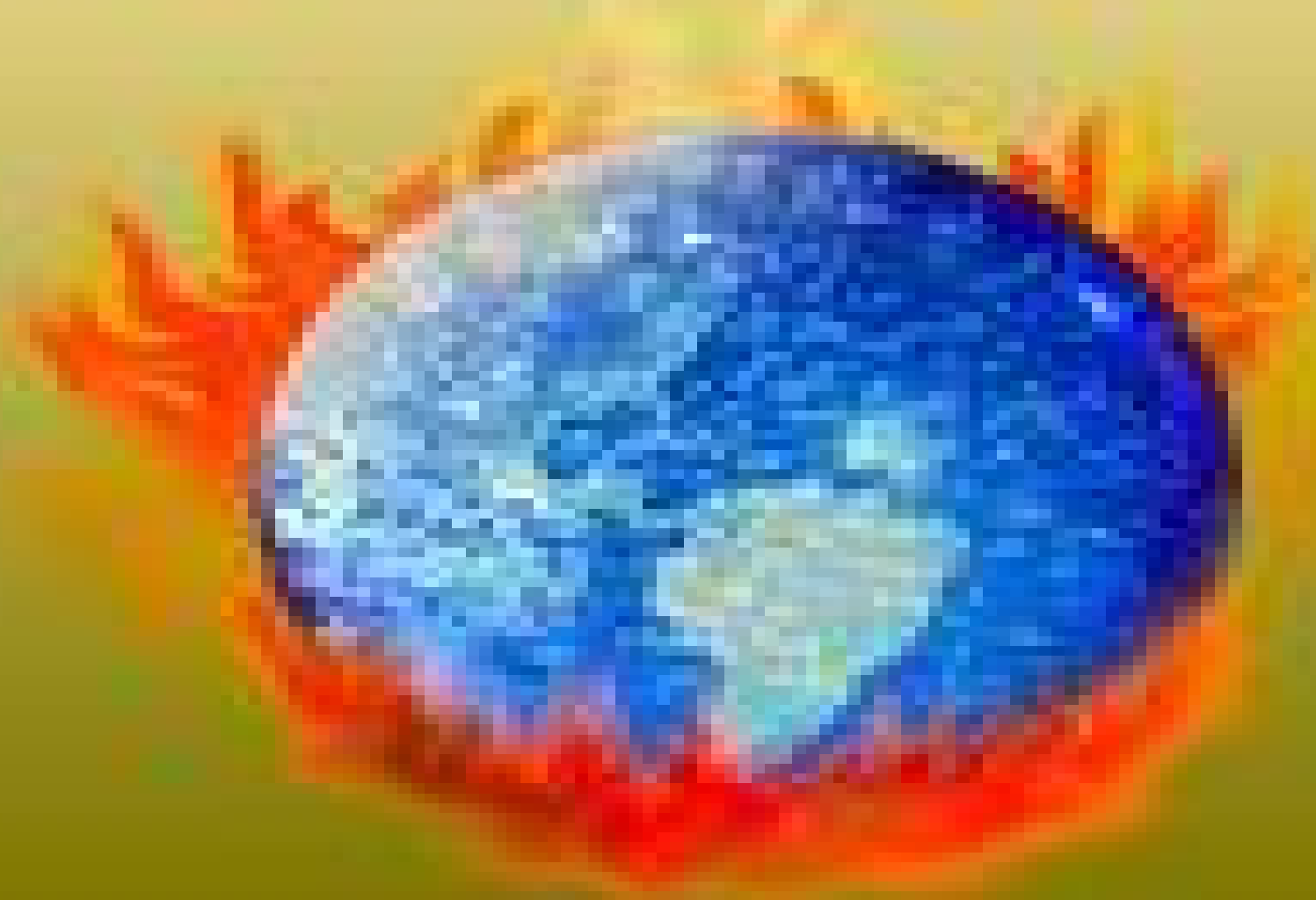
Indian Society of Lighting Engineers (ISLE)
(An Affiliate of International Commission on
Illumination – CIE) - **Mumbai State Centre**
(Maharashtra, Madhya Pradesh, Gujarat, Goa &
Chhatisgarh)

Director

MIT Lighting Research Academy, Pune

MIT School of Lighting & Management Studies,
Pune





GLOBAL WARMING

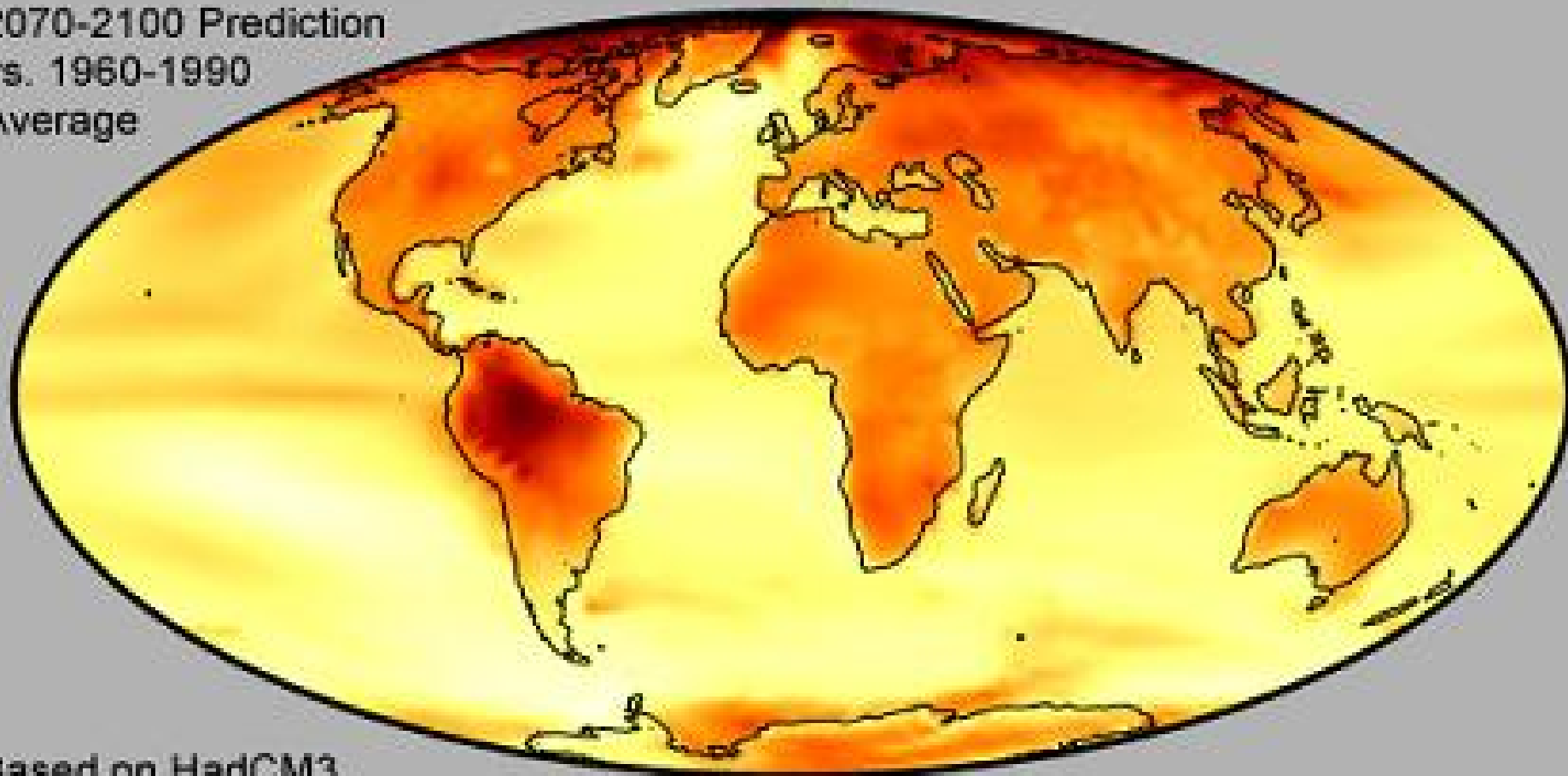
What it is ?

The average facade temperature of the globe has augmented more than 1 degree Fahrenheit since 1900 and the speed of warming has been almost three folds the century long average since 1970. This increase in earth's average temperature is called **Global Warming**.



Global Warming Predictions

2070-2100 Prediction
vs. 1960-1990
Average



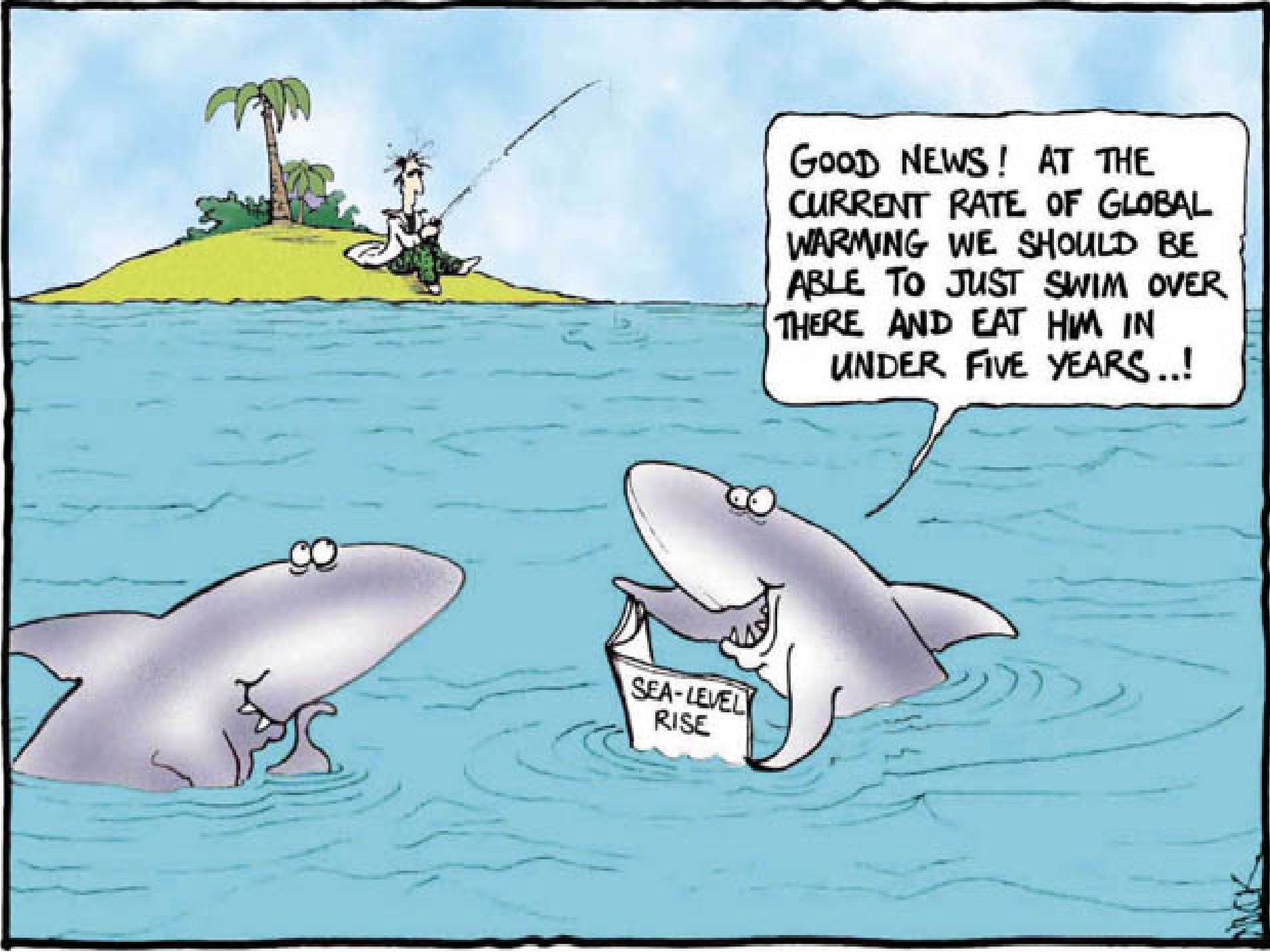
Based on HadCM3



GLOBAL WARMING

The global warming has led to **increase in mean earth surface temperature and thus melting of polar ice**. There are frequent melt down of glaciers that result in floods and other natural calamities. The melting of ice at the poles had led the mean sea level. And further increase in temperature may further melt the ice and lead to further increase in mean sea level, which will engulf low lying countries.





GOOD NEWS! AT THE
CURRENT RATE OF GLOBAL
WARMING WE SHOULD BE
ABLE TO JUST SWIM OVER
THERE AND EAT HIM IN
UNDER FIVE YEARS..!

SEA-LEVEL
RISE

WACK

GLOBAL WARMING

The effect of global warming can be felt on **seasons** too. There is **shift in season cycle**, as the **summers are getting longer than the winters**. This has affected the animals and made them to change their lifestyle accordingly, and those who failed to do so have perished or on the verge of extinction.



GLOBAL WARMING

The global warming is also responsible for the **introduction of some new diseases**. The **bacteria are more effective and multiply much faster in warmer temperatures compared to cold temperatures**. The increase in temperature has led to increase in the microbes that cause diseases.



GLOBAL WARMING

As a matter of fact, **because of global warming, the earth's atmosphere is getting more unpredictable with heavy rains in the areas**, which have scanty rainfall or drought in the areas, which received good annual rainfall. The months of rainfall has also getting affected.



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Light Pollution

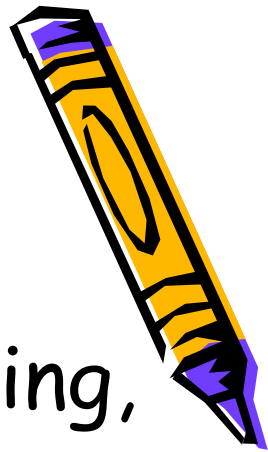
What it is?

Light that is annoying, wasteful or harmful caused by inefficient, unappealing or unnecessary use of artificial light



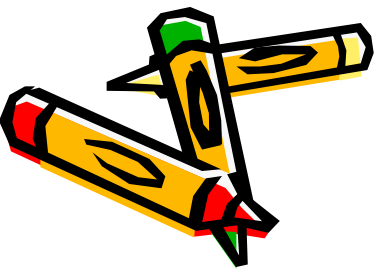
SOURCES

- Building exterior and interior lighting, advertising, commercial properties, offices, factories, streetlights, and illuminated sporting venues
- Most severe in highly industrialized, densely populated





TYPES OF LIGHT POLLUTION



LIGHT TRESPASS

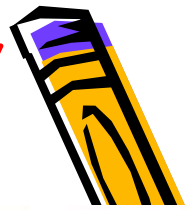
- Unwanted light enters one's property
- Strong light enters the window of one's home from outside, causing problems such as sleep deprivation or the blocking of an evening view



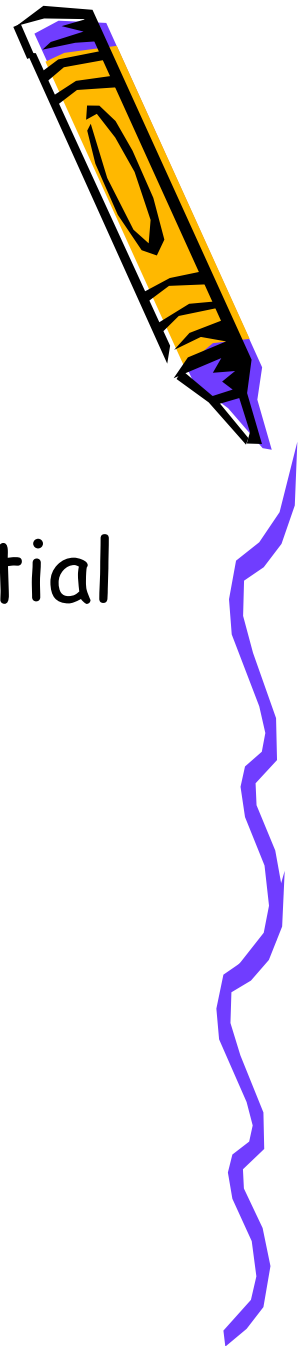
Example of Light Trespass



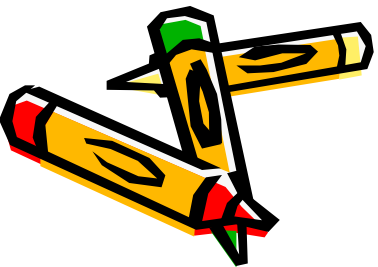
Example of Light Trespass from a floodlight installed by a hotel that casts light onto a house across the street



OVER ILLUMINATION



- Excessive use of light
- Over 30 percent consumed by commercial, industrial and residential sectors
- About 30 to 60 percent of energy consumed in lighting is unneeded



PHARMACY

HEALTH &

HOME OFFICE

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MARKET

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save

GIRLS

Smith & Henderson

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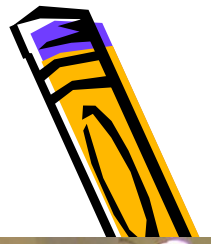
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NEW RELEASE

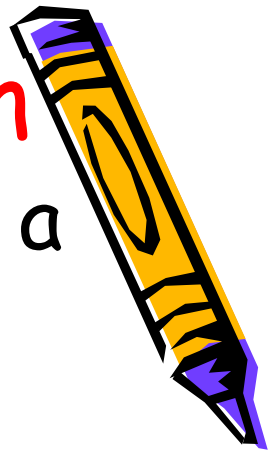


This Cosmetic Store has lighting levels over twice recommended levels



Causes of Over-illumination

- Higher levels of light than needed for a given task
- Incorrect choice of Light Sources & Fixtures
- Not using timers, sensors or other controls
- Improper selection of hardware to utilize more energy than needed
- Incomplete training of building managers and occupants to use lighting systems efficiently.
- Inadequate lighting maintenance



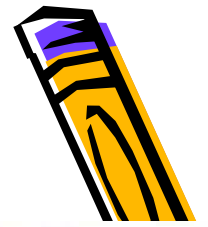
SKY GLOW

Combination of light reflected from what it has illuminated and from all of the badly directed light in that area, being refracted in the surrounding atmosphere.

Sky glow is of most concern to astronomers because it reduces their ability to view celestial objects. Sky glow increases the brightness of the dark areas of the sky, which reduces the contrast of stars or other celestial objects against the dark sky background.



Example of sky glow over a city



CONSEQUENCES OF LIGHT POLLUTION

- Energy Waste
- Effects on Human Health & Psychology
- Disruption of Ecosystems
- Loss of Safety
- Effect on Astronomy



EFFECTS

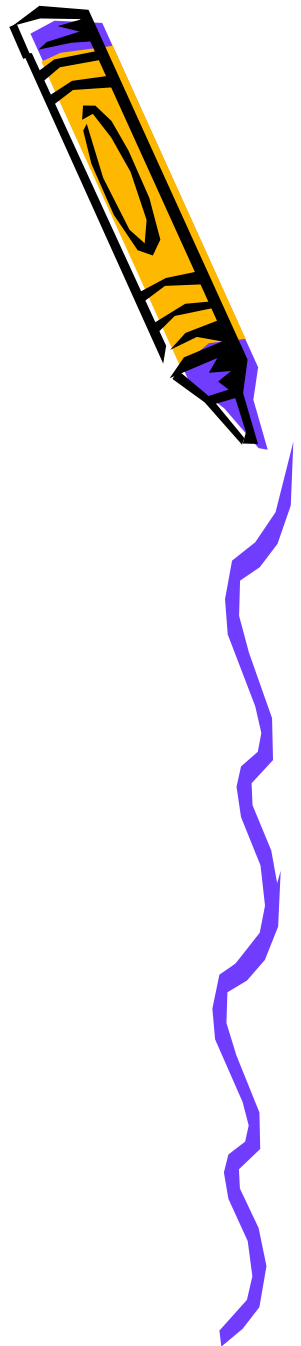
- Causes damage to the environment and health, as do other forms of pollution such as air pollution, noise pollution, water pollution and soil contamination
- It disrupts ecosystems, can cause adverse health effects, obscures the stars for city dwellers, interferes with astronomical observatories, and wastes

energy



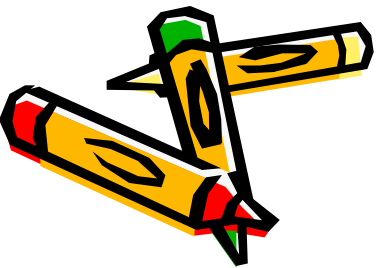
Health Effects

Induce loss in visual acuity,
hypertension, headaches and
increased incidence of carcinoma



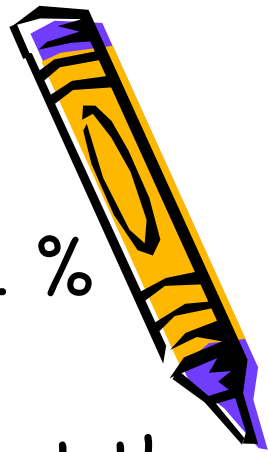
Social Effects

- Misuse of Light depriving other users for their basic necessities
- Heating of Environment leading to Global Warming



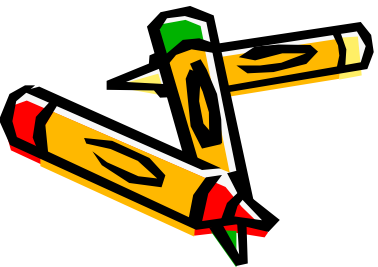
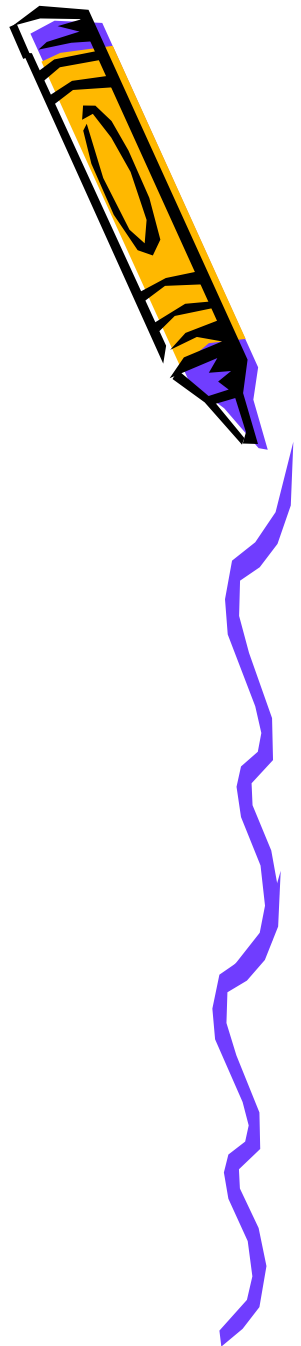
ELECTRICAL ENERGY SCENARIO IN INDIA

- » Demand is rising at the rate of 11 % per annum
- » Generating capacity is increasing at the rate of 6 % per annum
- » Gap between the demand and supply is widening at the rate of 5 % p.a.
- » Setting up of generating capacity costs approx. Rs. 7 Crore/MW and lead times are long
- » Virtually all States of the country are facing acute power shortages

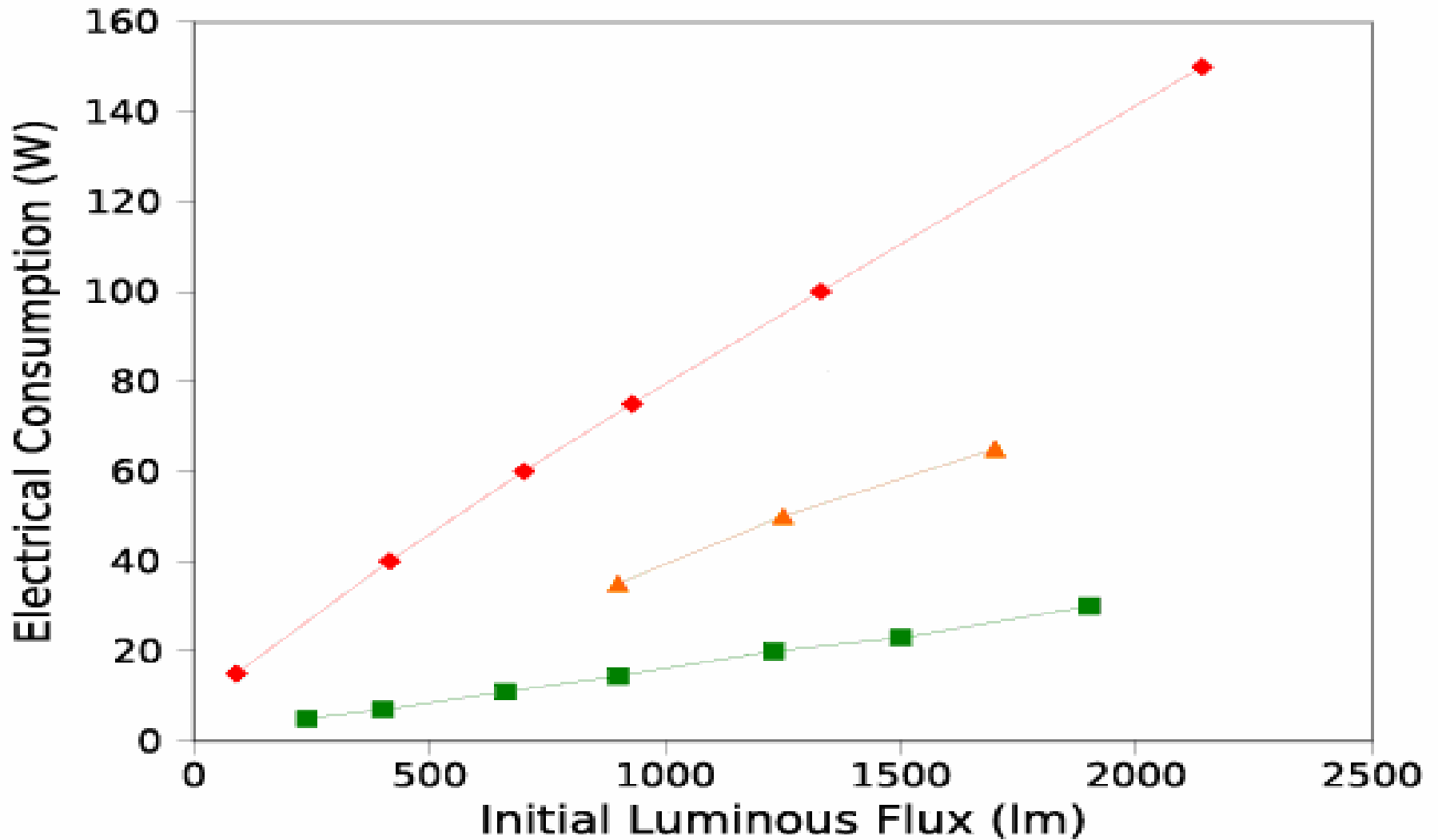


FACTORS FOR ENERGY SAVING

- Use of natural day light
- Use of most efficient light source
- Use of efficient luminaires
- Use of well designed lighting scheme
- Flexibility & control over switching operation
- Maintenance of lighting equipment
- Conducting illumination audit
- Use of light colour walls and ceiling
- Avoid use of glossy working surfaces



Electricity Use by Bulb Type



◆ Incandescent 240V ■ Compact Fluorescent
▲ Halogen

BENEFITS - 36W TFL Slim with Electronic Ballast

- Electrical Bill reduces by 58 %
- Light Effects are just like Day Light
- Works from 60 V to 340 V
- Efficiency is better than SV/MH Lamps
- EMI/RFI/PF/Surges as per international standards
- Reduces load on Air Conditioners
- Operates well in diverse temperature zones (-20 to + 50 Deg.C)
- Instant Start - No starter/capacitor is required - No flickering - No humming
- Very useful for inverter due to half load
- Excellent PF- More than 0.95
- Reduction of load on cable



BENEFITS

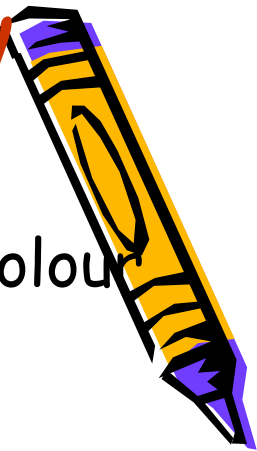
REDUCED MAINTENANCE

- Much higher life due to controlled current
- Four times life as compared to FTL
- 92 % Lumen Maintenance against 40 % depreciation of FTL
- 30 % Higher Lumen O/P saves equivalent electricity cost
- Almost *NIL* voltage fluctuation



ENERGY CONSERVATION MEASURES

- Use of most efficient lamps - Consistent & Colour Rendering
- Efficient use of light output from lamps
- Maintenance of lamps & fixtures
- Timely switching off
- Implementation of automatic control of lights (Timers/PV Cells)
- Best use of Natural Day Light
- Avoidance of absorption of light by surroundings
- Replacement of lamps which have exceeded their rated life
- Use of proper space to height ratio
- Use proper fittings, reflectors etc.
- Implementing ISO 14001 EMS



MEASURES FOR REDUCING LIGHT POLLUTION

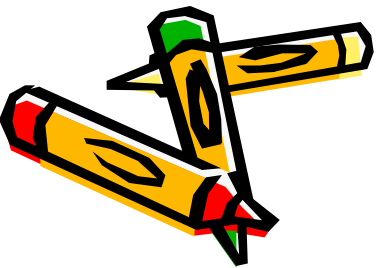
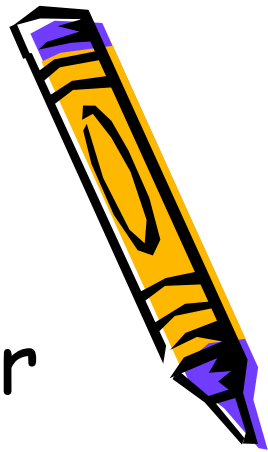
- Use of Appropriate Energy Efficient Light Sources
- Turning lights off using a timer or occupancy sensor or manually when not needed
- Improving lighting fixtures, so that they direct their light more accurately towards where it is needed, and with less side effects.
- Adjusting the type of lights used, so that the light waves emitted are those that are less likely to cause severe light pollution problems.
- Evaluating existing lighting plans, and re-designing some or all of the plans depending on whether existing light is actually needed

AWARENESS PROGRAMS

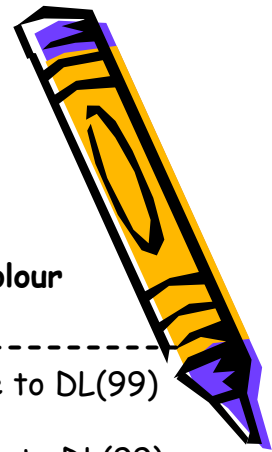


IGNORANCE

- Lighting is one which is taken for granted.
- Simplest thing of providing illumination by providing fixtures and light sources
- No such legislations curbing the present practices leading to pollution due to Lighting



COMPARISON OF LIGHT SOURCES



Type	Losses	Energy Consumption	Output (Lumens)	Output (L/W)	Efficacy (Hrs)	Av. Life (CRI)	Colour
100 W GLS	-	100 W	1200	12	1000	Close to DL(99)	
12V 50W Halogen	10-20 W	64 W	950	15	2000	Close to DL(99)	
13W CFL	6-10 W	20 W	900	45	2000-8000	Average(75)	
20W CFL(Electronic)	-	20 W	1200	60	2000-15000	Close to DL(99)	
150W SON-E(SV)	30-40 W	180 W	15500	86	15000	Yellow(25)	
250W MV(MercuryV)	30-40 W	280 W	12500	44.6	5000	More of B&G(45)	
250W Metal Halide	33-40 W	283 W	19000	67	6000-10000	Close to DL(80)	
40W FL	14-20 W	54 W	2450	45.5	5000	More of B&G(60)	
36W TFL Slim with Electronic Ballast	1 W (Due to HF) Ballast	32-33 W	3250	98.5	16000	Very close to Day Light(85)	



BAD



GOOD



AWARENESS PROGRAMS IN LIGHTING

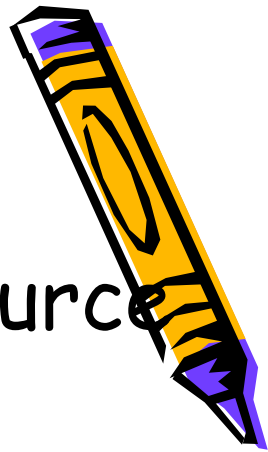
- Spreading the message of light through lighting education by different type / level of educational / awareness Programs
- Bringing awareness about the cost benefit analysis due to the use of Energy Efficient Light Sources
- Removing ignorance of the users about the benefits of switching over to such Energy Efficient Light Sources



Contd.....

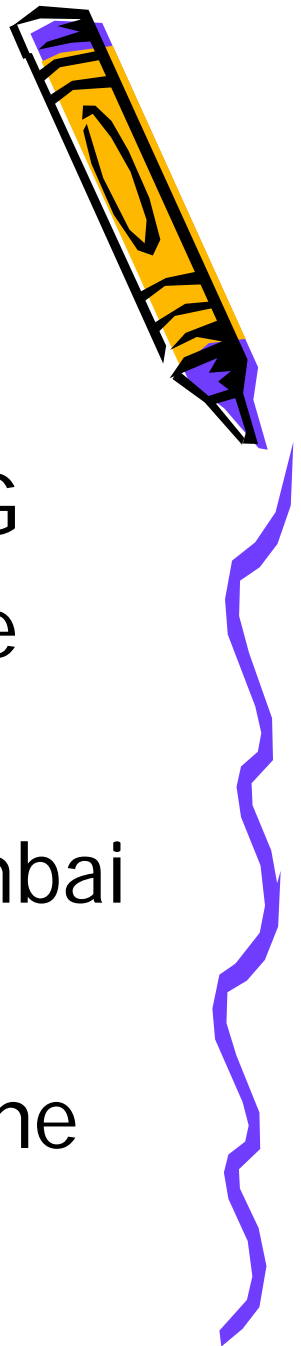
AWARENESS PROGRAMS IN LIGHTING

- It will result in saving of precious source of energy i.e. electricity
- Ultimately it will lead to saving in energy bill of common man, and thus improving the economical status
- It will save environment due to the use of efficient light sources
- It will save mankind from the harmful effects of global warming



LIGHTING EDUCATION IN INDIA

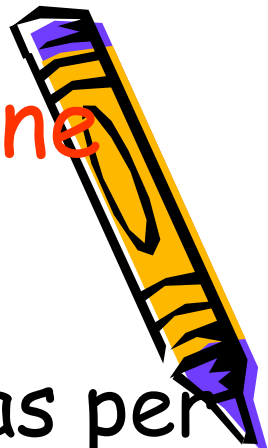
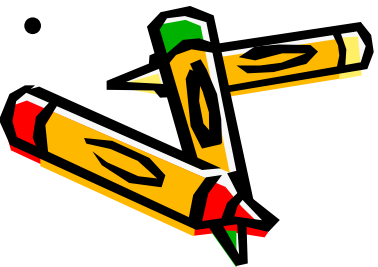
- Jadavpur University – Post Graduate
- Manipal Institute of Technology – PG
- Mumbai University – Under Graduate
- Indian Society of Lighting Engineers
- International Lighting Academy, Mumbai
- Other Institutes / Agencies
- MIT Lighting Research Academy, Pune



MIT Lighting Research Academy, Pune

OBJECTIVES

- Promoting Lighting Related Programs as per need of Lighting Industry
- Spreading message of Light through Seminars / Workshops / Conferences
- Conducting Short Term Courses / Distance Learning Programs for Architects / Interior Decorators / Working Professionals
- Promoting Applied Research Studies



Post Graduate (MBA) Program in Lighting Technology & Energy Management



- Lighting Technology 40 %
- Marketing Management 40 %
- Energy Management 20 %

Eligibility - B.Sc.(Physics / Electronics)
B.E. / M.Sc

Intake - 30

Duration - 2 years Full Time Semester Pattern



www.mitlra.com



MIT School of Lighting & Management Studies, Pune



GREEN LIGHT PROJECT

A MAEER's MITSOL Initiative



Green Pune
Commonwealth Youth Games 2008
Green Games & Environment
Programme

SPONSORS

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EVERYDAY SOLUTIONS



indian society of
lighting engineers

SARATHI

SAVE ELECTRICITY - N - ENVIRONMENT





Commonwealth Youth Games 2008

MIT School of Lighting & Management Studies, Pune
Commonwealth Youth Games 2008

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Commonwealth Youth Games 2008
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A CAREER'S MENTAL INITIATIVE
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Placement 2009 - Highlights

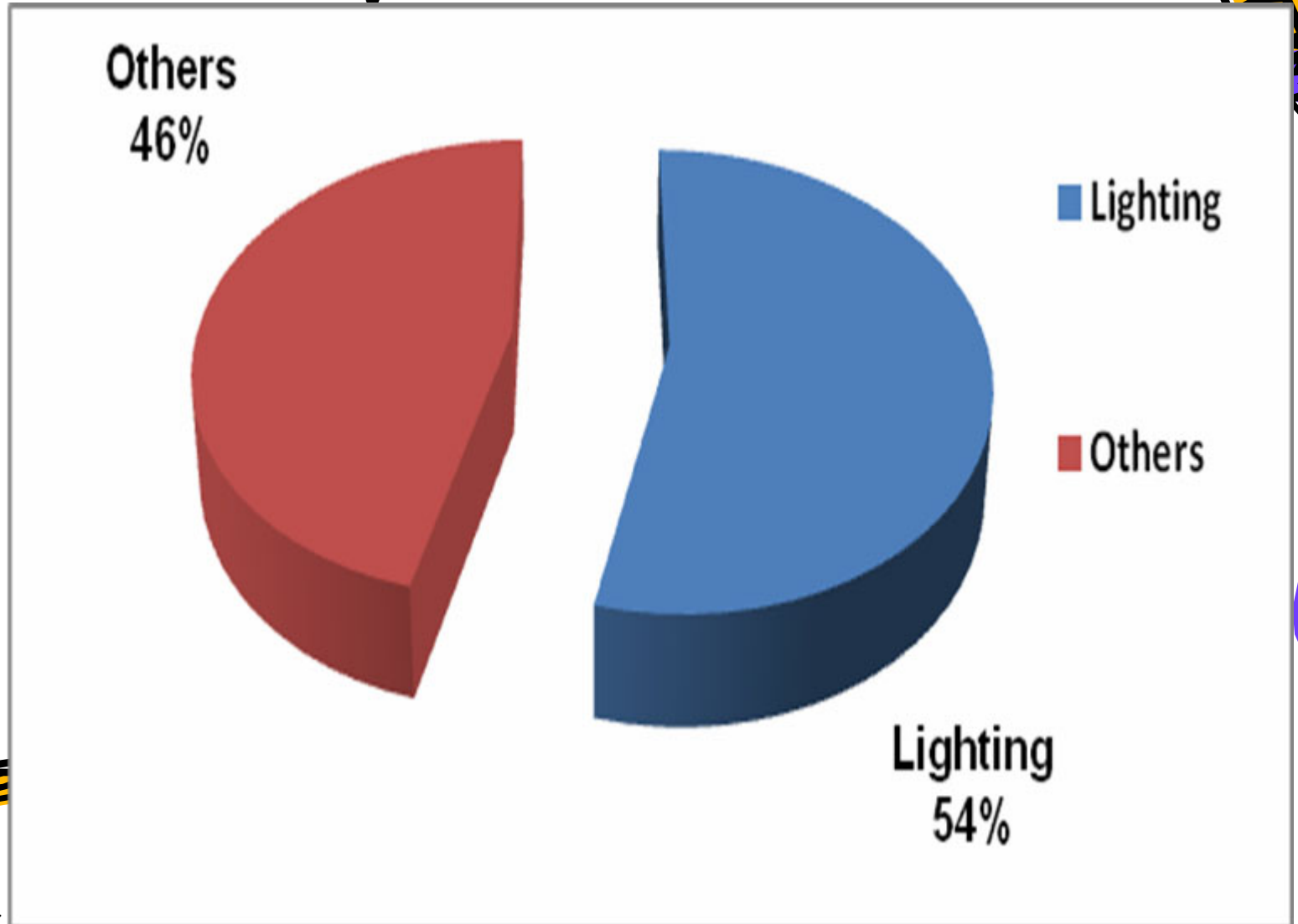
MIT SOL SETS A RECORD



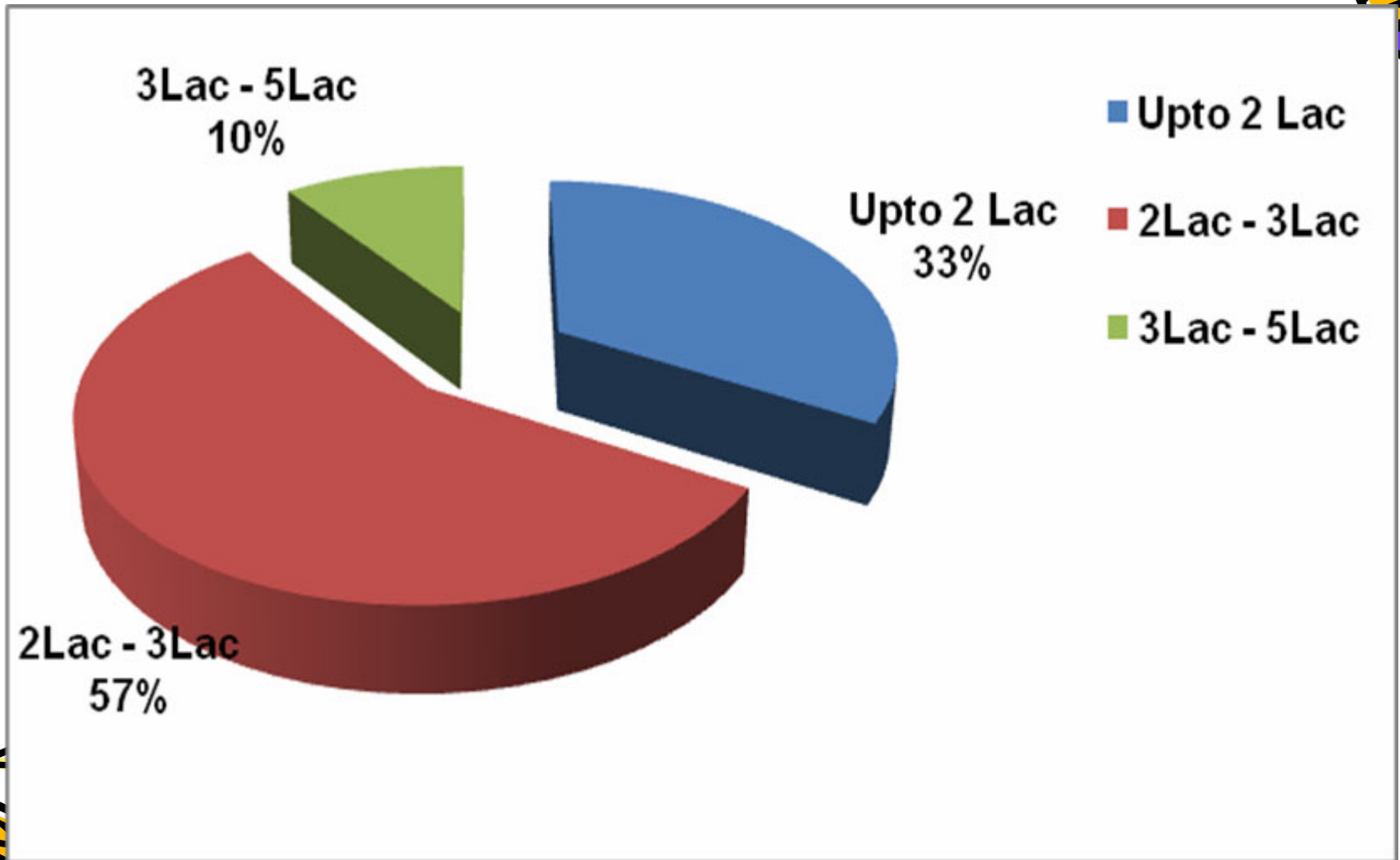
- 100% Placement
- 40 Offers to 30 students in 22 Companies
- 3 International Offers (Spaceage, UAE)
- Average pay package - 2.5 Lacs
- Highest salary offered - 36000
Dinham per year



Industry Sectorwise Status

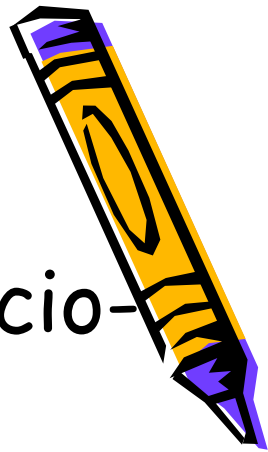


Rangewise Status



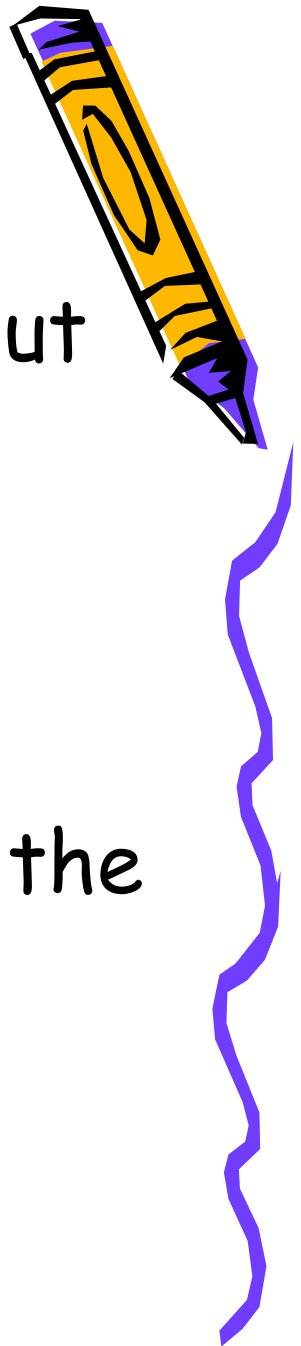
CONCLUSION

- Generation of employment opportunities, thus improving the socio-economic status of individuals
- Increase in number of such programs will motivate individuals to opt for teaching profession in Lighting, thus also improving employment opportunities
- Companies / Manufacturers will be able to expand their business because of the availability of competent educated manpower, thus improving the economy of the country



CONCLUSION

- It will help Govt. to frame Policy about different type of educational / awareness programs on Lighting
- To encourage NGOs / Institutes to embark upon such Educational / Awareness Programs on Lighting for the benefit of Society



O' Light !

Thou Art the *Bramha*
The Creator of the Universe
The Lord Almighty
Thou Art the indestructible Master of Energies
So, I install Thee
Bestow Peace on me

O' Light !

Do Good to all
Provide everyone with happiness, health and wealth
Let the enmity vanish

O' Light !

We salute Thee
To overcome the darkness of ignorance
To achieve knowledge and wisdom
For the well –being of the Universe
We pray Thee

O' Light !



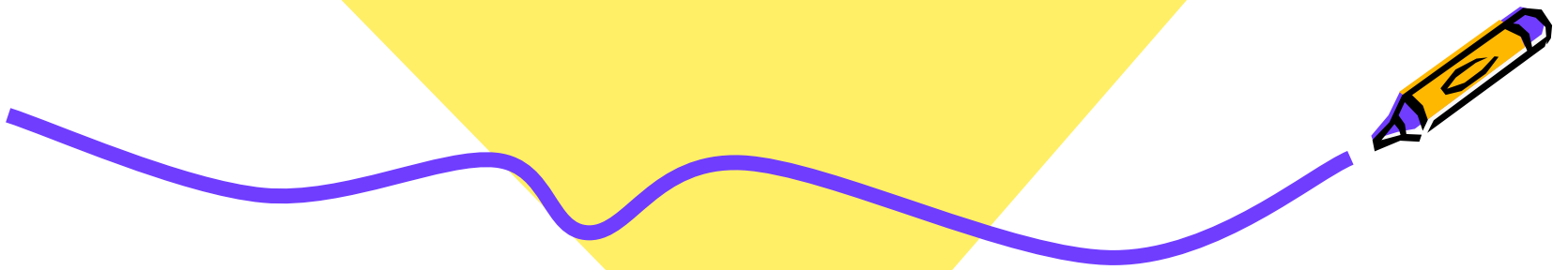
*Welcome to the World of
Lighting*

*Let us NOT take LIGHT -
Lightly*

Get Enlightened !



Thanks.....



Dr. Prakash Barjatia, FISLE

Director

MIT Lighting Research Academy, Pune

MIT School of Lighting & Management Studies, Pune

Chairman

Indian Society of Lighting Engineers (**ISLE**)

Mumbai State Centre

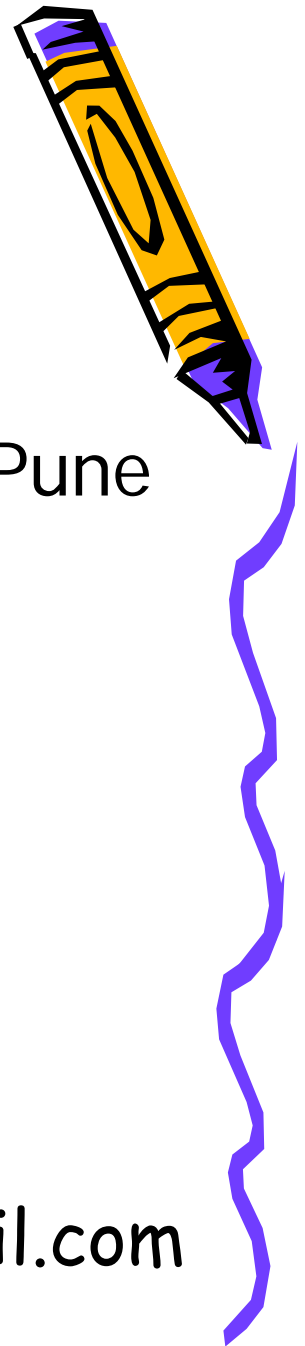
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www.mitlra.com



*Post Graduate (MBA) Program in
Lighting Technology & Energy Management*

- Lighting Technology - 40 %
- Marketing Management - 40 %
- Energy Management 20 %



Lighting / Energy Management Subjects

1. Introduction to Lighting Technology
2. Lighting & Its Measurement
3. Light Sources
4. Luminaires
5. Lighting Applications
6. Biological Effects of Light
7. Lighting Design
8. Lighting Management
9. Energy Management

