RNI Reg. No. DELENG/2001/4847

April 2010 Vol. X No. II

LIGHT the official NEWSLETTER

of the **indian society of lighting engineers**

Printed & Published by Mr. Harcharan S. Mamak, A 274, Defence Colony, New Delhi 110 024 on behalf of Indian Society of Lighting Engineers and printed by him at Graphic Point Pvt. Ltd., WZ-429 B, Naraina Village, New Delhi.

FROM THE PRESIDENT'S DESK

I have just returned from Indore where the active and vibrant Local Centre organised a very successful workshop on Lighting Trends and Technologies. The attendance of some 200 delegates who participated actively in the discussions and the eminent speakers from all over India who made the time to be there is evidence of a very enthusiastic environment for lighting in Indore.

This was the main event for the Silver Jubilee celebrations of the Society in Indore. Though other State Centres have already kicked off their own Silver Jubilee programmes, this was the first big event for the year.

The grassroots approach to increasing awareness in energy saving in lighting that Karnataka State Centre commenced last year is being continued successfully this year with a number of programmes already carried out and several more in the pipeline. While it is important to have national and international events, it is equally important to have these grassroots programmes.

These programmes can extend to a very varied audience. I recently gave a talk to some 150 students of class 7, 8 and 9 in Pune. While the approach required some tailoring to suit the children (it has to be more interactive), I was pleasantly surprised to see the how receptive the students were and how enthusiastically they got involved. I am happy to note that some State Centres have planned school level programmes this year (in the form of quiz programmes). In the past this has been overlooked. This is a good level to try and inculcate the principles of good lighting practice. And as I have mentioned in this column before, the home is where the least efficient lighting practice exists.

From July 11th through 16th a major Light Source Conference (LS-12) will be held in Eindoven, Netherlands. This once-in-three years event is a must attend to all those keen to learn about the latest in Science and Technology of Light Sources. I plan to attend it along

365 ways to light up your life

Crompton Greaves

EVERYDAY SOLUTIONS

CROMPTON GREAVES LTD.
LUMINAIRE DIVISION

Kanjurmarg (East), Mumbai - 400 042 (Maharashtra) India.
Tel.: (91) 022-55558429, 25782451 (Extn: 8447-52) Fax: 022-25787283
Website : http://www.cglonline.com Email : madhusudhan.panicker@.cgl.co.in.

with my colleagues and hope that there will be more participants from India.

It has always been tempting to just try and follow international trends in technical matters, more so today with the easy access provided by the internet. It is important however, to think things through and to this end I have made some suggestions in my article on an eco approach to lighting in India (on page 26). While Elcoma will be constituting a committee to discuss these issues, I very much look forward to your feedback and ideas.

Avinash D. Kulkarni
President
dradk@hotmail.com

EDITORIAL

This issue carries reports on activities from several State and Local Centres including the Indore Local Centre which recently organised the first of the big Silver Jubilee programme planned for this year. The level of activity is encouraging and is appropriate for our Silver Jubilee year.

As is the case elsewhere in the world of lighting this issue is dominated by discussion on LEDs. We are carrying an article by Prof. van Bommel which discusses the biological implications of replacing incandescent lamps with LEDs. There is a report on the lighting of the first 5 star hotel in India with LEDs by an Indian company. The WebWatch also column carries several items on this subject.

You will find reports on two international lighting events; Mr. Venkataramani's report on the CIE Conference in Vienna and my feedback on the Light + Build fair at Frankfurt.

In addition we have an excellent paper by the President, Dr. Avinash Kulkarni with suggestions on the direction the Indian lighting industry could take to be more eco friendly. Also published in this issue is the paper by Dr. Aithal, Dr. Adiga and Dr. Sarrakbettu presented at the 11th Lux Europa in Istanbul last year on bringing lighting to an underprivileged rural community in Karnataka.

It has been our attempt to use this newsletter to keep our members abreast of technical developments in the world of lighting. To this end it is important that there is a continuous flow of information to us both from India as well as internationally.

Visit to Light + Build, Frankfurt

I used to be a regular visitor in the 80s and 90s to the Hannover Lighting Fair (which later shifted to Frankfurt). This year I went again after a gap of more than 10 years. Since my last visit the lighting industry and the fair have changed tremendously. I give below some of my observations.

Walking through the Frankfurt Messe at the Light + Build Fair was like a walk through Fantasy Land. If you are a lighting enthusiast then you will enjoy this feast for your eyes. Different colours; both stationary and dynamic lighting; luminaires in varying sizes and shapes suspended; wall mounted or just floating in mid-air; a great variety of poles made in different materials; extraordinary lighting effects created by reflectors, mirrors, lenses, diffusers and other optical materials. Lighting controllers and electronic automatic systems played their role in ensuring the maximum advantage in quality lighting with the minimum usage of energy.

The greatest change of course was the overwhelming display of Solid State Lighting (SSL). More than 90% of the vast exhibition space of over 241,000 sq.mts was devoted to SSL in almost every conceivable application by 2200 exhibitors: Indoor, outdoor, decorative, utility, commercial, residential, professional etc. You name it and you would surely find the application on display with energy saving SSL.

It was impossible to cover the whole exhibition but I did visit about 100 stalls. The trend and the theme was clear - energy saving with cutting edge technology, which now is clearly SSL.

It was interesting to note that the focal point was not light sources but applications; luminares; lighting levels, lighting distribution and controllers were holding centre stage while SSL was almost the single source for light.

Though the display was 90% SSL, this segment accounts for 6% the total lighting business presently.

In order to give the reader a feel of the exhibition I want to group the exhibitors. First of all I want to state that contrary to my impression before I went to Frankfurt, the Messe did not have the dominant Chinese and Far - Eastern presence that we have come to expect at international fairs. It was very much a European dominated exhibition. Large, medium and small family owned companies effectively displayed their strengths. Whereas the large multinational companies like Philips, GE, Zumtobel, Thorn, Toshiba, Hitachi, Panasonic, Osram, Schreder, Trilux, Bega, Erco, etc. were present in large stalls; the system and controls industry held their own very effectively as well with the likes of Tridonic Atco, Panasonic, Vossloh-Schwabe, Legrand, Helvar, etc. Then there were the niche players with high-end designer application products such as Flos, Fagerhult, iGuzzini, Targetti etc.

The exhibition was application driven and therefore; you could walk in and out of office spaces, into restaurants, into hospitals, into schools, into gardens, under street lights, in apartments, into shopping malls and watch videos, read illuminated sign boards or even play with

light sources. If you still had questions then you probably had to wait in a queue over a cup of coffee to meet an expert.

There were only 10 Indian participants the Messe - two were involved with lighting and the other 8 were primarily interested in the "Building" portion of the exhibition. The 2 of interest to lighting were Surya Roshni and NTL Electronics. Both the stalls attracted a lot of attention judging from the string of visitors. The others from India were in brass components, electrical accessories, cable accessories, conduit electrical fittings etc.

A word about the organisation - it was highly professional, liberal distribution of maps was made, there was no question of getting lost or having difficulty to find any location; every hall was well marked and each row was alphabetically arranged and if you still faced a difficulty, then there were information booths almost everywhere with polite and well informed attendants on computers.

From the time the Messe doors opened on the 11th morning there were a continuous stream of visitors from all over the world. Most of the stalls were constantly full and I was told that business-wise the exhibition was a great success. Each company had their own social programs and customers and specifiers were treated with great respect and attention. (I understand that Frankfurt Messe attracted 1,70,000 visitors.)

I was personally very happy to be in a complete lighting atmosphere, and what I learnt in four days was more than I had expected. The approach to lighting is changing; the products are changing, the price equations are changing and most of all the technology is dramatically changing. We in India have to prepare ourselves for this change or we will slip off the world map of lighting.

I was fortunate that I was invited to the meetings at the Messe of the Global Lamp Forum, the CELMA meeting (Confederation of European Luminaire Manufacturers), and the working group for LEDs. It was encouraging to notice that the emerging markets of China and India command so much respect because of our double digit market expansion.

India will however, slip rapidly from the eyes of the world if we do not open our doors to emerging technology advancements. The challenge for the Indian Industry and Specifiers is clear. We certainly have the skills to meet this challenge and I hope that we will develop the required infrastructure to become Leaders in world lighting.

H.S. Mamak
Editor

OBITUARY

V. Shanmugavel
1943 - 2010

It is with great sadness that we inform you of the passing away in March of Dr. V. Shanmugavel, long standing Fellow member from Chennai State Centre.

After completing his M. Sc (Engg) Power Systems he did his Ph.D in Electrical Engineering (Conservation). He worked for 19 years in the Tamil Nadu Electricity Board in various capacities in the field of distribution, transmission and operations and training.

He later worked as a power consultant, energy auditor, valuer and safety auditor. He was also on the Faculty of Anna University, Staff Training College TNEB, Staff College of India and the PWD Training College.

He was a member of many professional organisations including the Institute of Electrical and Electronics Engineers, Institution of Engineers and several others

He was an active member of Chennai State Centre and his presence will be missed.

ISLE ACTIVITY

Silver Jubilee Celebration
April 23, 2010, Indore

As part of its programme to celebrate the Silver Jubilee, Indore Local Centre organised a Workshop on 'Lighting Trends and Technologies - Vision 2020' at the Fortune landmark Hotel on April 23. The day long workshop was attended by 214 delegates.

At the inaugural session, the Chief Guest was Mr. Krishna Murari Moghe, the Hon'ble Mayor of Indore and

Mr. Bharat Rawlani felicitating Mr. Moghe

Lii 2011 - Biggest Lighting Fair in India

LIGHT INDIA INTERNATIONAL

The Chennai State Centre of Indian Society of Lighting Engineers will organise the LIGHT INDIA INTERNATIONAL 2011, Chennai Trade Centre, Chennai, India, during 4-7 March 2011. This is slated to be the biggest lighting event in Indai.

The 1.5 billion dollar lighting Industry in India is witnessing a double digit growth in the last three years, thanks to the emphasis being given on infrastructure development by the Central and State Governments. With the increased investments in the Infrastructural sectors, the lighting industry is poised for rapid development.

The growing living standards in India are finding expressions in the lighting industry in many ways. Chennai and neighbouring areas are in the midst of an unprecedented growth in industrial and infrastructure facilities.

The Light India International 2011 will publicise the developments taking place in the lighting industry and provide excellent marketing opportunities for all the products and services covered by the lighting industry.

EXHIBIT PROFILE

- Residential, commercial, retail lighting
- Industrial lighting
- Street lighting
- Security lighting
- Environmental / Landscape lighting
- City Beautification lighting
- Architectural lighting
- Railway / Metro lighting
- Airport & Runway lighting
- Refineries / Mines lighting
- LED lighting
- Intelligent lighting
- Lighting with non-conventional energy
- Speciality lighting
- Lighting accessories and controls
- Power saving solutions
- Testing, measuring instruments

FLOOR PLAN

LIGHT INDIA INTERNATIONAL IS SUPPORTED BY

- Tamil Nadu Electricity Board
- Tamil Nadu Energy Development Agency
- Ministry of Micro, Small & Medium Enterprises, Government of India
- National Small Industries Corporation Ltd
- Tamil Nadu Small Industries Development Corporation
- Bharat Sanchar Nigam Ltd

FOR THE EXHIBITORS, LIGHT INDIA INTERNATIONAL PRESENTS OPPORTUNITY TO

- Present products and services to potential buyers / dealers / customers.
- Introduce latest technical know-how in lighting industry, energy efficiency and renewable energy
- Launch new products in the midst of media, industry professionals
- Increase brand awareness
- Explore investment opportunities
- Locate partners for joint ventures and tie-ups

ORGANISERS

The organisers of the event, the Indian Society of Lighting Engineers (ISLE) is a professional registered body in the field of illumination engineering with a broad based membership of scientists, engineers, architects, academicians, researchers and designers. ISLE is affiliated to the CIE, the International Commission on Illumination. It is closely associated with the Bureau of Indian Standards, the Department of Science and Technology, the Ministry of Power and the Ministry of Non-Conventional Energy Sources. An Organising Committee consisting of lighting professionals will guide in organising the event.

Many leading brands have aleady confirmed their participation.

For booking of space please contact ISLE, Chennai State Centre.

Tel. : +91-44-262577100 E-mail: info@Lii2010.in

Mr. R. Balasubramanian, Hony. Secretary - ISLE Chennai State Centre

(Mobile: +91-9840055645) E-mail: balu@Lii2011.in

Mr. S. Raghavan, Advisor - ISLE

(Mobile: +91-9790974048) E-mail: sraghavan@Lii2011.in

the Guest of Honour, Mr. Madhu Verma, Chairman, Indore Development Authority.

Mr. Madhu Verma

Mr. Akhilesh Jain, Chairman, Indore Local Centre welcomed the dignataries and delegates and highlighted the purpose of the workshop. Dr. P.C. Barjatia gave the opening remarks.


Mr. Akhilesh Jain

Dr. A.D. Kulkarni, President ISLE in his address strongly advocated the need for ISLE to empower the common man by making him aware of the possibilities of good lighting. And as a first step the Society needed to ensure that all its own members were fully conversant with all aspects of lighting. He said that 36W Tri-phosphor coated FTL T8 lamp which is the best value for money, is not known to many and it seemed to be the best kept secret in the lighting industry.

Mr. Moghe said that he supported such initiatives and hoped that it would be a first step in helping to improve the existing situation of a peak load of 6500MW with an availability of only 4000 MW. He asked the participants not to ignore the rural sector.

Dr. Sanjay Jain

Mr. Verma described the development work taking place in Indore with the use of more efficient lighting equipment especially in the street lighting.


Mr. Rajendra Raje

Dr. Sanjay Jain Director, MIT School of Design, Pune gave the Keynote speech. His presentation focused on the changes that are taking place in the way we live and work. There was a need for energy convergence and squeezing more out of materials and systems through micromanagement.

The inaugural session was conducted by Mr. Rajendra Raje, Co-convernor of the workshop. After the tea break the first technical session was introduced and moderated by Mr. Bharat Rawlani, Organising Secretary of the workshop.

Mr. Saumen Bhaumik from Philips Electronics spoke on street lighting and public lighting. His presentation included the new trends in this field, the new products that were becoming available, the issues of safety and security, biological requirements and the need for master planning the lighting of our cities.

Mr. Amar Mahajan of Wipro spoke on Modern Trends in Office Lighting and Brightness Control. This presentation showed the changes taking place in the new office environments with new working styles and the need for the lighting to be more creative and inspirational and in many cases to include the possibility of personalisation to meet widely varying individual needs.

After lunch the session was introduced and moderated by Mr. A.D. Pundalik, Convenor of the workshop.


Mr. A.D. Pundalik

Mr. Sapan Narula from VFX Studio gave an exciting presentation on Lighting in the Entertainment Industry. Through a blending of technology and art he demonstrated with examples of his work on music videos and animation films how lighting is used to express emotion and mood.

Mr. S. Chakraborty of Surya Roshni made a presentation on Industrial Lighting. This presentation was a comprehensive overview of lighting issues. He explained how it was important to achieve a balance between the often conflicting objectives of lighting quality and energy efficiency and to keep in mind that good lighting has to satisfy the user.

Mr. Dilip Kumbhat, Chairman, ISLE Chennai State Centre gave a brief update on the progress of Lii2011 being held in March next year. He indicated an expectation of 70 exhibitors from Taiwan and the support of 25 leading lighting companies.

The Session after tea was conducted by Mr. Rajendra Raje.


Ar. Deepti Vyas

Mr. Sarang Bodhankar of Crompton Greaves gave an exhaustive presentation on LED Lighting covering both the technology as well as the applications.

Dr. P.C. Barjatia gave the Valedictory address summing up the days proceedings.

The vote of thanks was given by Ar. Deepti Vyas.

Alongside the workshop there was an exhibition of products in which the sponsors took part. The main sponsor for the event was Arya and the co-sponsors were Philips, Crompton Greaves, Wipro and Surya. The

hospitality sponsor was Fortune Landmark, the academic sponsor was MITSEL and the media partner, Nai Duniya.

The conference was followed by a cocktail dinner reception for the Indore Local Centre Organising Committee members and their spouses together with members of the Governing Body and Mumbai State Centre committee. There was a recital by the well known flute maestro Mr. Salil Datey.

KOLKATA STATE CENTRE

Seminar on National Lighting Code
November 14, 2009, Kolkata

A one day Seminar on the National Lighting Code was organised at the K.P. Basu Memorial Hall at Jadavpur. This was organised jointly with SISED, JU. Mr. N. Nagarajan, Director, Standardisation, ISLE chaired the Seminar.

In the first half Mr. P.K. Mukherjee, Ex. Dy. DG, BIS gave an 'Overview of the National Lighting Code and Energy Efficient Lighting Systems'. After that Mr. P.K. Bandyopadhyay, Past President, ISLE and Chairman of the ET 24 Panel for the National Lighting Code made a presentation entitled 'National Lighting Code- A Guide to Lighting Professionals and Consumers for Proper Lighting'.

After the lunch break, in the second half an interactive session was conducted where representatives from Educational Institutions, Consultants, Contractors, Large Users, and Lighting Manufacturers gave their views, suggestions and sought clarifications on the National Lighting Code. Mr. N. Nagarajan, Chairman of the seminar summed up the proceedings.

The Seminar was well attended with about 75 participants and ended with tea and snacks

---

Technical Programme
January 08, 2010, Kolkata

A programme was organised at the Vivekananda Hall of Jadavpur University, Kolkata. Mr. Rajat Roy, Past Chairman, ISLE Kolkata State Centre chaired the meeting. Mr. P. K. Chatterjee, Chairman, ISLE Kolkata State Centre welcomed the members and guests.

The meeting started with an invocation and lighting of the *mangal deep* to officially inaugurate the Silver Jubilee Celebration of ISLE. On this occasion ISLE Kolkata State Centre felicitated the President, Dr. A. D. Kulkarni and Past President, Mr. P. K. Bandyopadhyay and presented them with shawls.

Dr. A. D. Kulkarni gave a presentation on 'New Challenges in Light Source Development'. Mr. P. K. Bandyopadhyay gave a presentation on 'My Most Interesting Lighting Project'. Dr. Saswati Majumdar, Director, Education & Training gave a presentation on 'LED Lighting - Opportunities and Applications'. The programme was attended by large number of members and guests.

Mementos were presented to the speakers. Mr. Arun Kr. Daschoudhury, Secretary, ISLE Kolkata State Centre proposed the vote of thanks. The meeting was followed by tea and snacks.

MUMBAI STATE CENTRE

Elections

In September 2009 the Mumbai State Centre decided to hold its elections for the terms 2009-10 and 2010-11.

The Scrutiny Committee comprising Mr. S. Roy Choudhury, Mr. Shailesh Doctor and Mr. C. R. Ravindranath (Convenor) was formed and the notice inviting nominations sent out in November, 2009.

Of the 9 nominations received one was withdrawn and one was found invalid. The remaining seven nominees, listed below were declared elected.

Dr. Prakash Chandra Barjatia
Mr. Veerkumar Shivalal Doshi
Mr. Rajendra Kumar Gupta
Mr. Stan Alvares
Mr. Prakash Venkatrao Mavinkurve
Mr. Bhavesh Mehta
Mr. Amalendu Auddy

The new MSC Committee was formed at the meeting on 11th March 2010 and the portfolios decided unanimously as indicated below:

Dr. Prakash Barjatia	-	Chairman
Mr. S. Alvares	-	Hon. Secretary
Mr. A. Auddy	-	Hon. Treasurer
Mr. Rajendra Gupta	-	Convenor, Public Relations Sub-Committee
Mr. P.V. Mavinkurve	-	Convenor, Membership Sub-Committee
Mr. Bhavesh Mehta	-	Convenor, Programme Sub-Committee
Mr. V. Doshi	-	Member

Co-opted :

Mr. P. Doshi

Ex-Officio :

Mr. K. Naveen (Outgoing Hon. Sec.) - Convenor, Education Sub-Committee

Dr. Avinash D. Kulkarni - GB Member & President
Ar. Rohini Mani - GB Member
Shri P.C. Jain - Chairman, Pune Local Centre
Shri Akhilesh Jain - Chairman, Indore Local Centre

INDORE LOCAL CENTRE

Lecture on Sunlight: The Gift of Nature
January 31, 2010, Indore

It was decided that during the Silver Jubilee year Indore Local Centre would organise monthly lecture programmes. For the month of January, a talk by Prof. Shreekant Tare was organised on January 31.

His lecture covered different aspects of the light and energy provided by the sun and how these could be made use of.

The talk which was attended by Students, Lighting Professionals, Engineers and Scientists from different walks of life.

Dr. Prakash Barjatia, Chairman, Mumbai State Centre and Director, MIT School of Energy & Lighting was also present during the lecture and he gave details on the activities of ISLE and MITSEL. Mr. Akhilesh Jain, Chairman ISLE ILC welcomed the participants and Mr. Dinesh Wadhwa, Hon. Secretary thanked all present. The speaker was introduced by Mr. Rajendra Raje.

Lecture on Metal Halide Lighting: Overview and Advancements
February 28, 2010, Indore

In his talk on metal halide lighting, Mr. Akhilesh Jain (Consultant and Supplier of Industrial Lighting) and Chairman, ISLE Indore Local Centre, covered the technology and development of metal halide lamps, comparing them with halogen, mercury vapour and sodium vapour lamps. He also described the Improvements in the technology of ballasts and ignitors.

Pictures of a number of excellent lighting applications and installations were presented encompassing lighting for Highways, Streets, Areas, Stadiums, Parking Lots, Airports, Showrooms and Monuments.

The programme was attended by members, architects, students, professionals, engineers from the industries among others. Mr. Rajendra Raje conducted the programme. Mr. Bharat Rawlani introduced Mr. Akhilesh Jain and Mr. Dinesh Wadhwa, Hon. Secretary proposed the vote of thanks.

Dinesh Wadhwa
Hon.Secretary
Indore Local Centre

PUNE LOCAL CENTRE

MITSEL - ISLE Student Chapter

Lecture on Energy Efficiency In Lighting Design
February 9, 2010, Pune

MITSEL - ISLE Student Chapter in association with the Pune Local Centre and Mumbai State Centre decided to hold Lectures / Seminars and Visits as a part of Silver Jubilee celebrations. It was also decided to keep these open to ISLE Members, Lighting Professionals and anybody who is interested in the subject of Lighting, in addition to the students. All events were organised by the students with the help of Lighting Faculty Prof. Shilpa Pant under the guidance of Dr. Prakash Barjatia, Director, MIT Lighting Research Academy, Pune. All Lectures and Seminars were held at the MIT Campus in Kothrud, Pune.

The Silver Jubilee celebrations were launched on February 19 with a lecture by Mr. Anil Valia, Lighting Designer and Educator and also author of 'Designing with Light - A Lighting Handbook'. The topic of his presentation was Energy Efficiency in Lighting Design. Different aspects relevant to the topic were dealt by him. His lecture was attended by the students, academicians and lighting professionals. The programme was chaired by Dr. Avinash Kulkarni, President ISLE, who appreciated the initiative of the students for organising events as a part of Silver Jubilee celebrations of ISLE.

Visit to CIRT Testing Laboratories
February 26, 2010, Pune

A visit to the Photometric and Electrical Testing & Calibration Facilities of the Central Institute of Road Transport (CIRT), Pune was arranged for the students and faculty members on February 26. CIRT is well equipped with the state of art facilities specifically for automotive lighting and signaling equipment and the visit was found interesting and instructive by the students. The visit was coordinated by Mr. Rajkumar Malajure, Scientist-C, Quality Manager and the students were taken round by Mr. Kartikeyan, Scientist-A.

Seminar on Exterior Lighting
February 27, 2010, Pune

A seminar on Exterior Lighting was organised on February 27. It was addressed by Mr. K. Naveen, General Manager of Bajaj Electricals, Mumbai. His lecture covered different aspects of exterior lighting as well as different types of light sources relevant to these applications. The

seminar was attended by students, academicians and lighting professionals.

Lecture - Primary Source Of Light : The Sun
March 26, 2010

Prof. Shreekant Tare of Indore made an interesting presentation elaborating the importance of the Sun for making human life possible and comfortable. He emphasised the need for utilising energy from the sun to the maximum possible extent for illumination and other applications as an alternate source of energy.

Prof. (Dr.) O.N. Awasthi, former Dean of Instruction, Regional Institute of Education (NCERT) presided over the lecture programme. He appreciated the presentation and added that in the present context there was a good opportunity for using the sun as an alternate source of energy.

P.N.Bhagwan
Hon. Secretary
ISLE PLC

KARNATAKA STATE CENTRE

Lighting Workshop for CPWD
February 18, 2010, Bangalore

About 45 CPWD officials of the rank of Sr. Architect, SE, ExE, AExE as well as Contractors attended a lighting workshop held by ISLE KSC in Bangalore.

Mr. Ramesh Garg welcomed the Chief Guest, Guest of Honour, Mr. Humne SE Elec., Delegates, and the Faculty Members.

Mr. Sathyendra, Hon. Secretary gave a brief introduction about ISLE and the projects undertaken by the Society.

Mr. M.S.N. Swamy in his inaugural address focused on the prime problems and the areas requiring attention by the lighting professionals and service providers.

Mr. Bhavani Prasad, former DG CPWD said that the need of the hour was a change in thinking and the creation of new methods while designing lighting keeping in view natural lighting and the use of controls. He also talked about the need for saving energy and protecting the environment

Mr. Humne highlighted the various methods adopted by CPWD in the conservation of energy and the plan to implement these concepts in new projects.

Mr. Ravindran gave a vote of thanks and invited the speakers to begin the technical session.

The workshop in progress

The following papers were presented:

Source Management & Disposal, Mr. M.S.N. Swamy, Chairman ISLE KSC

A New look at Lighting, Mr. Bhavani Prasad

Energy Audit, Mr. Ravi Rao

Standards, Mr. M.G.Sathyendra, Hon. Secretary. ISLE KSC

Landscape Architect's Experiences in External Lighting Design, Dr. Rommel Mehta, School of Planning & Architecture, New Delhi

City Beautification, Mr. K. Naveen, Bajaj, Electricals

Lighting using LEDs, Mr. M. Rawal & Mr. K. Kalaiselvan, GE Lighting

The concluding session was chaired by Mr. Bhavani Prasad. The issues discussed included:

- The harm to the environment from improper disposal of discharge lamps.
- LED usage, specifications, testing and guarantee of life, criteria for selection of LEDs. Also discussed was the need to replace neon lamps in signage applications for reduction of energy consumption.
- Fiber Optics as a source for increasing the life of artifacts, paintings, records, etc.
- Lighting pedestrian crossings and road intersections, and providing systematically designed lighting for the footpath for greater user comfort, increased safety for pedestrians as well as motorists at a substantially lower cost than that of present street lighting.

The meeting concluded with thanks to the Chair and the delegates.

Workshop at NIE

February 19, 2010, Mysore

The Lighting Workshop at the National Institute of Engineering in Mysore was attended by about100 Engineering Students from various disciplines including Architecture, Electrical & Electronics and Post Graduate studies. Several faculty members were present as well.

Prof. Dr. T. Ananthapadmanabha, HOD EE welcomed the ISLE Members, NIE MC Members, Faculty Members and the students to the lighting workshop which was being held for the first time.

Mr. Bhavani Prasad gave a brief introduction about ISLE and the projects undertaken including the Rural Education Programme.

Mr. M.S.N. Swamy, Chairman ISLE KSC inaugurated the workshop. In his address he emphasised the responsibility of each individual to help to preserve the environment and combat global warming.

The workshop he said would show how easy it was to save upto 50% of the energy used for lighting without compromising the quantity of quality of light by replacing existing light sources with more efficient ones available. He emphasised that switching off was not a good solution to the problem.

Mr. C.K.N. Raja, Director NIE MC, in his address reminisced about how rich we used to be with abundant electrical power but today as a result of wrong priorities we have wasted our valuable resources. He wanted awareness programmes like the lighting workshop to be carried out in all fields to help influence the future decision makers.

Dr. M. S. Shivkumar, Principal, NIE focused on the prime problems and the areas requiring attention, in particular, "the lack of syllabus" and the interaction of Lighting Companies with the Institutions.

Further, he wanted better coordination with lighting professionals and service providers. In his address he described various projects undertaken by the institution in spreading knowledge of production and usage of nonconventional energy sources.

The following papers were presented:

Lighting & Society, M. S. N. Swamy, Chairman, ISLE KSC

Language of Lighting, Sridhar, Bajaj Electricals

Recent Developments in Lighting & Controls, K. Naveen, Bajaj Electricals

Projects for Students, Bhavani Prasad, EX DG, CPWD

The concluding session was chaired by Prof. Ananthapadmanabha.

Some points that emerged from the session are given below:

Students showed great interest in increasing their awareness of lighting in general and LEDs in particular. They wanted help in undertaking projects that would be useful to them through interaction with industry.

They recognised the dangers to the environment from improper disposal of discharge lamps and the need to spread awareness of this issue.

The students recognised that switching off was not a useful option.

Prof. Dr. Ananthapadmanabha asked the students to talk to their colleagues and others connected with lighting about what they had learnt in the interest of energy saving.

The workshop concluded with thanks to Chair and the students.

Workshop at Canara Engineering College

March 13, 2010, Bantwal, Mangalore

A Lighting Workshop was held at Canara Engineering College, Bantwal, Mangalore for 50 Engineering Students from various disciplines, including the post graduate students, Faculty Members, MESCOM Engineers, Students and Faculty Members of other colleges.

Dr. Nagesh Prabhu, Principal, CEC welcomed the ISLE Members, Speakers, the Media and the participants for this lighting workshop which was a first for this institution. He felt that such exchanges would help in creating awareness and bringing change in the society's thinking for a better tomorrow. He also expressed a wish to establish an ISLE local centre at Mangalore.

Mr. Mohan Rao. K Introduced all the guests.

Prof. T. N. Shanubhogue, HOD E&E Dept. gave a rundown on EEEA activities.

Mr. M.S.N. Swamy, Chairman ISLE KSC gave the welcome address and Mr. Bhavani Prasad gave a brief

Lighting the inaugural lamp

introduction to ISLE and its activities including the rural education programme undertaken by ISLE KSC.

Prof. Dr. Radhakrishna S. Aithal, Joint Director, MIT Manipal inaugurated the workshop and in his inaugural address touched upon the various problems due to global warming and depleting resources. He said there were still lakhs of families in the country that did not have electricity. The MIT had done a survey and were trying to help the villagers around Mangalore with light sources using solar energy and requested that such programmes were taken up to help raise the standard of living.

Dr. U.S. Mohandas Nayak, President CHSA in his address expressed thanks to ISLE for having come to share their knowledge on a very important subject and he hoped that the interaction would bring about awareness on conservation of energy. He wanted such awareness to be spread further for better utilization of resources. He hoped that the workshop would lead to the awakening of future decision makers.

Mr. Riaz Kagalwala expressed thanks on behalf of the ISLE KSC for giving an opportunity to share their experience and hoped that the college would take the initiative to form a local centre at Mangalore. He also hoped that the college would include Lighting as one of the elective subjects in future.

Mr. Raghuveera H, Canara Engineering College gave a vote of thanks and invited the speakers to begin the technical session.

The following papers were presented:

Source Management & Disposal, Mr. M.S.N. Swamy, Chairman ISLE KSC

Standards, M. G. Sathyendra, Hon. Secretary. ISLE, KSC

LEDs for illumination, Issues & Challenges, K. Naveen, Bajaj Electricals

City Beautification, Dr. Savitha G. Kini, MIT Manipal

A New look at Lighting, Bhavani Prasad, Ex DG, CPWD

Lighting Using LEDs, K. Guruprasad, Akanksh Marketing

Integrating Artificial Light with Daylighting, Srikumar M. Menon, M.I.T. Manipal

The concluding session was Chaired by Prof. T. N. Shanubhogue, HOD E&E Dept. and Mr. Bhavani Prasad, former DG, CPWD and included an interesting question and answer session.

The workshop was followed by an excellent cultural programme by the students adding glamour to the event.

The workshop concluded with thanks to Chair, the College and the delegates

---

Workshop at State Bank of Mysore
March 23, 2010, Bangalore

A workshop on lighting and energy saving was held at the State Bank of Mysore in Bangalore. It was attended by 60 delegates including Engineers, Managers and others.

Mr. Belor Sreepathy, AGM welcomed the speakers and delegates. He said that they had a huge electricity bill every month and expressed the hope that they would benefit from the workshop by implementing what they learned in their new projects. He also introduced the speakers and invited them to begin the technical session.

Mr. M.S.N. Swamy Chairman, ISLE KSC introduced ISLE to the participants. He assured the Bank that if they looked carefully at the available resources and judiciously implemented these in line with the practical demonstration in the workshop, they could save more than 50% in their lighting power consumption. He said that all that was needed was for decision makers to change their thinking. He assured SBM of the fullest support from ISLE for implementation of energy saving solutions.

Mr. Bhavani Prasad in his address expressed the need for a change of approach and for adoption of new methods while designing lighting, keeping in view natural lighting and the use of controls. He assured an overall saving of 25% to 30% in total power consumption through some of the suggestions made in his presentation.

The following papers were presented:

Lighting & Society, Mr. M.S.N. Swamy, Chairman, ISLE KSC

Recent Developments in Lighting, Mr. Bhavani Prasad Ex DG, CPWD

The meeting concluded with thanks to Chair and the delegates.

Workshop at MSR Polytechnic
March 29, 2010, Bangalore

The Lighting Workshop conducted at MSR Polytechnic was attended by 60 Engineering Students and Faculty Members from various disciplines.

Welcoming Mr. M.S.N. Swamy Chairman ISLE KSC, Mr. Rama Rao, Principal MSR Polytechnic said that he was confident that such exchanges would help in a better understanding of the issues in the field of lighting and influence future action in a positive way. He wanted to join hands with ISLE for better exchange of views in the interest of the students and their future.

Mr. M.S.N. Swamy in his opening address gave an outline of the objectives and activities of ISLE.

Mr. Miyya introduced Mr. Swamy and invited him to begin the technical session.

In his presentation on Lighting and Society Mr. Swamy told the audience that they were the future decision makers and would need to rise to the challenge of confronting global warming and energy shortages. His presentation gave examples of energy saving solutions in lighting that could be easily implemented. He also showed the students the job opportunities that existed in the lighting profession.

Mr. Belor Sreepathy welcoming Mr. Swamy and Mr. Bhavani Prasad

Mr. Swamy being felicitated

The meeting concluded with thanks to Chair and the delegates.

M.S.N. Swamy
Chairman, ISLE KSC

CIE ACTIVITY

CIE Conference on Lighting Quality & Energy Efficiency

March 14-17, 2010. Vienna, Austria

CIE conducted this Conference in a grand manner with over 350 delegates from all around the globe taking part in the three day programme.

Conference President and CIE President, Dr Franz Hengstberger gave the opening welcome address. In his speech he mentioned that this Conference initiative of CIE on "Lighting Quality & Energy Efficiency" is the first of a series of Conferences to follow. He added that the intention is to hold the future Conferences and Exhibitions in the developing part of the globe as well.

Some of the highlights of the Conference are as follows:

- 16 Keynote Speeches from eminent personalities from the Lighting Industry, Standardisation bodies, Educational institutions, Architects, Lighting Consultants, Lighting Design Practitioners and so on.
- 66 Oral Presentations on different topics related to the Conference Subject.
- 5 Workshops and 8 Oral Presentations connected to the Workshop topics.
- 64 Poster Presentations.
- Exhibition of Products and Systems by some of the Sponsors.
- Well organised Social Events and Evening Programs.

This served as a unique forum to get to know the latest developments and results from all parts of the world. The various topics that were presented and discussed were clustered under the following:

- Efficiency & Quality
- Lighting & the Environment
- National & Regional Energy Saving Programs
- International Energy Saving Initiatives
- Colorimetry & Colour Rendering
- Visual Comfort
- Circadian Photoreception/Photobiology Effects
- Cost Effectiveness of Lighting Installations
- Daylight
- Applications
- Daylight/Light & Safety
- White/Yellow/Photometry & SSL

The workshops were on the following topics:

- Integration of Energy Efficient Street Lighting Systems and Equipment in New and Existing Installations
- Energy Efficient Lighting - From a Marketplace for Ideas to a Showcase for Solutions
- Beyond the Visual - Lighting & Quality of Life
- Mesopic Photometry & Outdoor Lighting
- LEDs/Let's go for Quality

The Key note Speeches were on different important topics.

I am very pleased to report that Mr. S. Chakraborty of Surya Roshni gave a Key note Speech on "Lighting Trends, Developments & Challenges in India" which was well received by the audience.

Mr. S. Chakraborty

In conclusion it was a focused, very effective and successful Conference.

Proposal for Next Steps for ISLE:

As ISLE we are now directing our focus substantially on Lighting Education by carrying out different programmes. The next CIE session will be in South Africa in 2011.

I propose that as ISLE we should go for a CIE Sponsored Conference on "Lighting Quality & Energy Efficiency" in India during 2012.

S.Venkataramani
Past President ISLE
Vice President CIE

CIE PUBLICATIONS

Chromatic Adaptation under Mixed Illumination Condition when Comparing Softcopy and Hardcopy Images

CIE 162:2010

The chromatic adaptation transforms (CATs) used in most colour appearance models (CAMs) assume that

observers are fully adapted to a given set of viewing conditions. Unfortunately, the condition of complete chromatic adaptation usually does not occur in the consumer market and in more casual industrial use. Instead, these users tend to view softcopy in a room with sufficient ambient illumination to allow comfortable viewing and examination of hardcopy imaging. Further, users often desire to compare hardcopy and softcopy images using rapid successive binocular observations. The focus of this report is to determine how colour imaging experts can best accommodate the desires and practices of these more casual observers. It shows that accounting for mixed and incomplete chromatic adaptation produces more accurate results in colour appearance than not accounting for them. It includes a mathematical model for chromatic adaptation and provides appropriate parameters for the chromatic adaptation model under such viewing conditions.

This publication corrects and replaces CIE 162:2004 "Chromatic Adaptation under Mixed Illumination Condition when Comparing Softcopy and Hardcopy Images" and is readily available via the website of the Central Bureau of the CIE (www.cie.co.at).

The price of this publication is EUR 44, (Members of the National Committees of the CIE get 50% discount).

Selected Papers of the Light and Lighting Conference with Special Emphasis on LEDs and Solid State Lighting

CIE x034:2010

In May 2009 the Light and Lighting Conference took place in conjunction with the CIE Midterm Meeting. The conference dealt with all aspects of light and lighting, with special emphasis on LEDs and Solid State Lighting, covering vision and health as well as the measurement of these modern devices and their application.

From the large number of oral and poster presentations in the scientific program of the conference 24 papers were selected by CIE experts for this CIE publication. These selected papers cover the whole range of the conference topics, i.e. latest achievements obtained in light and lighting, their consequences in photometry and colorimetry, their health aspects, and applications, both indoor and outdoor.

The publication consists of 186 pages with 150 figures and 64 tables and is readily available via the website of the Central Bureau of the CIE (www.cie.co.at).

The price of this publication is EUR 72 (Members of the National Committees of the CIE get 50% discount).

UV-A Protection and Sunscreens

CIE 186:2010

Technical Committee TC 6-24 was formed in 1992 due to the importance of the deleterious effects associated with exposure to UV-A radiation and because of a lack of existing guidance/regulations on tests for UV-A protection. The objective was to arrive at an international consensus on such tests. By 1997 the committee had identified one in vivo method worth pursuing, i.e. Persistent Pigment Darkening, and several in vitro methods that had not yet been validated. It was not possible to reach a consensus at that time, however. In the meantime the development of methods to assess UV-A protection continued and is still on-going, especially on in vitro methods. Furthermore, the computer-aided calculation of sunscreen performance - referred to as in silico - became more sophisticated and useful. Rather than trying to find a consensus on sunscreen testing the objective of the reactivated TC 6-24 has now been reduced to giving, in the form of a Technical Report, a comprehensive overview as well as an assessment and ranking of the UV-A methods currently under discussion. This report starts with the general principles of UV protection and an overview of UV-A and broad-spectrum UV filters. Then a description and assessment of in vivo, ex vivo, in vitro and in silico methods is given. This publications is readily available via the website of the Central Bureau of the CIE (www.cie.co.at).

The price of this publication is EUR 56 (Members of the National Committees of the CIE get 50% discount).

UV-C Photocarcinogenesis Risks from Germicidal Lamps

CIE 187:2010

Increasingly, UV-C (100 nm - 280 nm) mediated air disinfection (principally 254 nm radiant energy from low-pressure mercury lamps) is being used as a building environmental control to provide human protection from transmission of airborne pathogens such as tuberculosis bacteria, influenza viruses and other aerosolized agents. Some uses of UV-C energy require direct exposure of the volume room air in a horizontal plane directly above the heads of occupants. In these settings there is the potential of reflected or scattered UV-C radiation that could result in human exposure. Known side effects of overexposure to UV-C radiation include transient corneal and conjunctival irritation (photo-keratoconjunctivitis) and skin irritation (erythema), which disappear within a 24 - 48 hour period, not currently known to produce lasting

biological damage. The ACGIH and ICNIRP threshold limit for 8 hour continuous exposure to UV-C radiation at 254 nm is 6 $mJ \cdot cm^{-2}$ (60 $J \cdot m^{-2}$), and proper installation of well engineered UV-C systems meet this criteria. However, there have been incidents of poor installations resulting in accidental UV-C overexposures. General statements that all UVR is carcinogenic have raised safety concerns of open air UV-C systems. Although, from basic biophysical principles, UV-C radiation is carcinogenic for the same reason that it is an effective germicidal agent, the attenuation provided by the stratum corneum and epithelial tissues of the skin greatly reduces the risk relative to UV-B radiation. UV germicidal irradiation can be safely and effectively used for upper air disinfection without a significant risk for long term delayed effects such as skin cancer. This publications is readily available via the website of the Central Bureau of the CIE (www.cie.co.at).

The price of this publication is EUR 44 (Members of the National Committees of the CIE get 50% discount).

Proceedings of CIE 2010 "Lighting Quality & Energy Efficiency"

14-17 March 2010, Vienna, Austria

In March 2010 the Lighting Quality & Energy Efficiency Conference took place in Vienna, Austria. The event gave academics, lighting industry professionals, designers, researchers and representatives of regulatory authorities the opportunity to discuss best practice and the latest developments in the field of light and illumination. Recommendations were also made for reducing the amount of energy used for lighting. One of the hottest topics at the conference was light emitting diodes (LEDs), which offer significant environmental and energy-efficiency benefits compared with conventional light bulbs and energy-saving lamps. The Proceedings of this Conference include invited papers and contributed papers as well as papers on the poster presentations.

The publication consists of 845 pages including 146 contributions with some 700 figures and 223 tables. CIE x035:2010 is readily available via the website of the CIE Central Bureau (www.cie.co.at).

The price of this publication is EUR 180 (Members of the national CIE organizations get 50% discount).

NEWS ABOUT MEMBERS

ISLE Member Wins International Award

At the 24th European Photovoltaic Solar Energy Conference in Hamburg, Germany in 2009, the paper

Analysis on the 'Integration of PV Power at Eco-Tourism Site' by Dr. Biswajit Ghosh and S. Bardhan was selected by the official jury as the winner of the Poster Award in the thematic area of PV Deployment. The citation says that "this outstanding scientific poster was deemed to be an exemplary contribution to the 24th European Photovoltaic Solar Energy Conference and Exhibition".

Dr. Biswajit Ghosh

ISLE Member Lights up Diu Bridge

The former Portuguese enclave, Diu is an island of breeze and beauty which has international standard beaches.

The bridge linking the 2 townships, that is, Diu old city and Ghogla facilitates mobility across the sea for a stretch of 850 metres. The bridge has an all round view and is located in the centre of the island with clear visibility of the sea shore on either side.

Mr. K. Guru Prasad ISLE member from Karnataka State Centre designed and executed the lighting of the bridge.

While designing the scheme, the emphasis was to give a floating effect to the bridge where the water level is quite high. This was achieved through focussing from the bottom with high intensity coloured metal halide lamps. Yet another feature of the bridge was that it has 13 boat shaped foundation pillars depicting the local culture of fishermen. These were highlighted in different colours.

It was necessary to ensure road safety as well as give an aesthetic appearance. This was achieved with specially designed wing shaped decorative poles carrying polycarbonate spheres having high quality optical performance using prism design. The downward surface of the fixture illuminating the wing shape of the poles with radium painting ensure that even in the day time when the fixtures are not glowing, the circular spheres sparkle in sunlight.

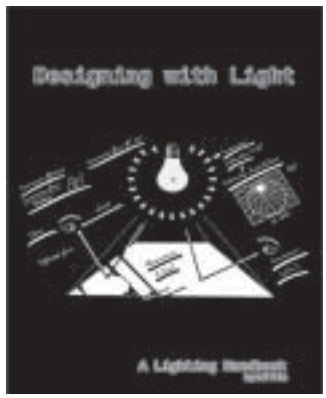
The main challenge was to prevent any physical damage to the bridge structure for installation of fixtures and poles. This was effectively overcome by the specially designed cantilevers to the boat structures and stands for erection of poles with brackets.

This project appears in the brochure released by Daman and Diu Tourism on the occasion of Liberation Day, 19th December 2009.

K.Guru Prasad
Avishkaar Illumination Creations
Banglore
avishkaar.kgp@gmail.com

Special Offer for ISLE Members

Mr. Anil Valia, Founder member and former Vice President of ISLE published Designing with Light - A Lighting Handbook in 2002.



This hard bound volume with 66 chapters, 800 figures, charts, graphs and illustrations is intended for use by the entire spectrum of professionals and students with an interest in lighting issues.

For ISLE members Mr. Valia is offering this publication at a discount of Rs. 1000 on the list price of Rs. 2500 till stocks last.

For futher information contact:
International Lighting Academy
9, Omex Apt.,64 Sahar Road
Koldongri, Andheri (East)
Mumbai 400 069
Tel.: +91 22 26838413/66922443
internationallinghtingacademy@gmail.com

Views of the new lighting of Diu Bridge.

FORTHCOMING EVENTS

LS12-WhiteLED3

The Science and Technology of Light Sources 12th International Symposium and White LEDs and Solid State Lighting 3rd International Conference
July 11-16, 2010, Eindhoven, The Netherlands

The International Symposium on the Science and Technology of Light Sources has been held regularly since 1973 and provides a unique opportunity for the worldwide community of engineers and scientists from the lighting industry, research organisations and academia to meet, present and discuss their work on light source research and development.

The International Conference on White LEDs and Solid State Lighting held its inaugural meeting in Tokyo in 2007 with the 2nd due to be held in Taiwan in December 2009. The conferences aim to provide a forum for scientists, engineers and designers to discuss all aspects of fundamental and applied research on white LEDs and SSL (Solid State Lighting) in a stimulating and informed atmosphere.

For the first time, in the period from Sunday, July 11th to Friday, July 16th, 2010 the two conferences will be held jointly in Eindhoven, the Netherlands, on the campus of the Eindhoven University of Technology. The aim is to bring these two communities, which to date have evolved separately, into contact with each other. The LS community's interests have reflected contemporary light source technology during its over 30 years history and this has resulted naturally in a growing, now significant, representation of SSL technologies (LED and OLED) in its programmes. In contrast, the WhiteLED and SSL conference community's interests have, by definition, focused wholly on the rapidly growing white LED and OLED based SSL technologies.

For further information contact :
www.is-wled.org

Light & Care 2010

November 10, 2010, Eindhoven, The Netherlands

At the beginning of the last decade, the discovery of specific photoreceptor cells in the ganglion cell layer of the retina has boosted research about the impact of light on health. The discovery provided a physiological basis to the existing notions that light is not just for vision. Light controls the circadian rhythm and regulates the sleep-wake cycle. It has a major impact on our well-being via a wide variety of processes in our bodies and our minds.

Light & Care 2010 is an international scientific conference to provide an overview of the effects of light and lighting on human health, performance, and wellbeing, with a special focus on healthcare application. It approaches these issues in its broadest sense, including mood, behavior, subjective and objective health, comfort, vision, atmosphere perception, productivity and performance. A major question is how to design appropriate light scenes and light therapy can be used and designed to optimize health and well being under a wide variety of settings, ranging from specific healthcare related work shifts to care homes for the elderly.

The goal is to bring together a multidisciplinary group of scientists, designers and healthcare professionals working in this domain with 'users' of the proposed light applications, so they can meet, present research, share experiences, and exchange ideas.

Key themes of the conference include:

Daylight and electric lighting, lighting control, intensity and variations in intensity, color, color temperature and light therapy

All in relation to:

- Seasonal Affective Disorder SAD
- Sleep/wake cycle, sleep-disturbances and sleep-disorders
- Dementia, Alzheimer's disease
- Obesity
- Diabetes
- Public & Occupational health, healing environments, shift work
- Productivity, performance, Health & well being
- Melatonin, cortisol

Call for papers

Academics, healthcare professionals and practitioners with an interest in research, theory, technologies, and applications related to the medical, visual and non-visual, and psychological effects of lighting are invited to submit their work for presentation. Original, high quality papers are sought which make substantial contributions to the field. All accepted papers will be collected in the printed volume (with ISBN) of the official conference Proceedings.

Submissions should adhere to the CHI Conference Publications Format, available at http://www.acm.org/sigchi/chipubform.

The conference is organized by the Light & Health Research Foundation SOLG.

Manuscripts should be submitted to info@solg.nl

For more information contact:
schoutens@solg.nl

NordLED 2010
November 11-12, 2010, Copenhagen

NordLED 2010 continues the tradition of nordic lighting conferences organized by the Nordic Lighting Committee - Nordlys. This year focus is on LED - light emitting diodes.

Main subject areas of NordLED 2010 are:

- LED - indoor lighting
- LED - outdoor lighting
- LED - technology, standards and research
- LED - lighting projects (Pecha Kucha)
- LED - discussion workshop

The conference includes lectures, workshop, exhibition, excursion to LED projects in Copenhagen and the Nordic Lighting Award.

Call for papers

The organization committee invites all professionals working with aspects of LED to submit papers for the conference.

Deadline for delivery of papers: 1st of June 2010.

Find more information about call for papers at http://www.centerforlys.dk/ekstra.php?id=77

Registration will also open at soon at www.nordled.dk

LETTERS TO THE EDITOR

On Sun, Mar 28, 2010 at 2:25 PM, Deepak Gahlowt <deepak@xebecdesign.com> wrote:

Dear Mr Valia and Mr Venkataramani

This is in reference to your letters in the ISLE news letter dated Jan 2010 sub: About CFL - views for...

I have been concerned about this drive for promoting CFL as an ecologically sound product. So much so that, in our experience, we see even the FTLs being replaced by CFLs in many offices.

One particular case in point is that of the ICICI Bank, which has made it mandatory that no FTLs can be used in their projects. I am unable to convince the officials because I don't have authentic data available that I can use to prove my point.

I request your support in being able to source data/ advice from reputed professionals like yourself and companies like Philips in this regard. I would like efficiency and life cycle data on various types of CFLs, FTLs including T5s.

Hope you both can help.
Deepak Gahlowt, Architect

TECHNICAL PAPER

Incandescent Replacement Lamps and Health
Wout van Bommel

Abstract

Incandescent replacement CFL and LED lamps have a larger blue component than red component. Contrary, incandescent lamps have a larger red component than blue component. Our eye has light sensitive cells that connect with the biological clock in the brain, which in turn connects with the pineal gland that controls for a part the rhythm of our hormone metabolism. One therefore wonders whether general domestic evening use of CFL and/or LED lamps can disturb our natural rhythm of hormone metabolism and therefore have negative consequences for our natural body rhythm and our health.

The total non-visual biological effect of light ("biological dose") has been calculated for different light sources on the basis of the biological action spectrum. First, the relative spectral energy distributions are weighted according to the spectral photopic eye sensitivity V_λ in order to arrive at equal lumen output. Our calculations show that CFL and LED lamps with a corrected color temperature of around 4000K and moderate color rendering result in a ca. 34% higher biological dose than incandescent lamps. CFL and LED lamps in the range of 2700 - 3000K and good colour rendering however result in a slightly lower biological dose than incandescent lamps (1-7% lower). Seen from a health point of view there is therefore no objection against a changeover in the domestic area from incandescent lamps to CFL and/or LED lamps with color temperature 2700-3000K and color rendering 80 or more.

Introduction

Figure 1 shows the spectral sensitivity, B_λ, for non-visual biological effects together with the spectral sensitivity

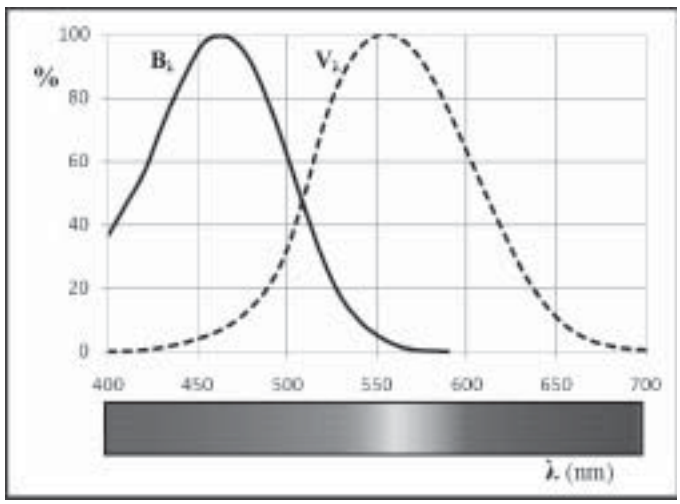


Fig. 1: *Relative spectral sensitivity of the eye for photopic vision, V_λ, and for non-visual biological effects, B_λ, (biological action spectrum [1]).*

for photopic vision, V_λ. The maximum sensitivity of the novel cell type is obtained for light with short wavelengths

continued on page 23

For a glow like the Sun,

choose any one...

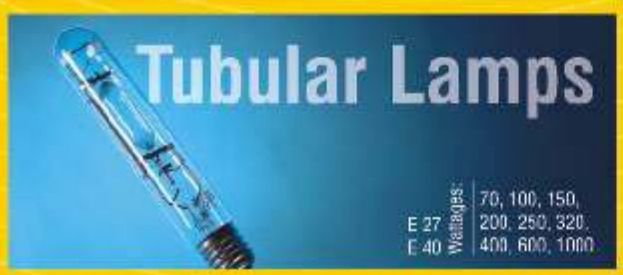
UNIFORM®

VENTURE LIGHTING

An Advanced Lighting Technologies Company-USA

Metal Halide Systems

Lamps • Ballasts • Ignitors • Luminaires
• Colour Lamps • Integrated Ballast System (IBS)



International Approvals

VENTURE LIGHTING INDIA LTD.
Plot No. A30 & D5, Phase II, Zone B, MEPZ, Tambaram,
Chennai 600 045, India. Tel. : (044) 2262 5567 / 2262 3094,
Fax : (044) 2262 5569, E-mail : baranco@vlindia.com,
Website : www.venturelighting.com

MAKHIJA 5364

India's First 5 Star Hotel Lit by LEDs

Binay Opto Electronics is in the process of completing the commissioning of LED lighting in India's first Swissotel Hotel (of the Singapore-based Raffles group), where the entire lighting in the public areas has been implemented completely with LED lights. This 5 Star Hotel of 150 rooms is a Swissotel franchise, and this facility in Calcutta is their first endeavour in India.

The architect (Mr. Kapil Bhalla) had initially recommended international fittings (from Europe and the US) for the hotel. However, this requirement was converted to LEDs, while providing the same colour (2700K), the same beam angle, and the same brightness. Not only have all the light intensity requirements been fulfilled, but their entire lighting load has also been reduced by 70%, along with a warranty of 5 years for all LED products.

The lighting was first done in the Banquet and the Prefunction area, where 100W halogen lights a have been replaced with 30W warm white LED fixtures with a narrow beam angle of 8 degrees.

The lights have been equipped with an indigenously developed microprocessor controlled hand-held Remote dimming system, with the feature of providing a range of dimming scenes for the banquet.

The Coffee Shop is also entirely illuminated using LED Downlighters of 30W (replacing halogen 100W).

The outdoor garden at the Coffee Shop is provided with IP-65 rated LED Garden Spike Lights (to replace halogen spike lights), with the same brightness of a 50W Halogen Lamp (550 Lumens), but with a total wattage only 10 Watts.

As these are LED lights, they are sealed and moisture-proof, and will never need replacing; hence the fixture will never degrade, as there is no possibility of any kind of water ingress.

For the Swimming pool we have supplied 70W LED Pool lights (to replace 250W or 300W Halogen Lamps) in Stainless Steel SS-316 fixtures, with a 5-year warranty.

For the terrace gazebo, we have supplied 10W LED Gazebo Lights and Up-Down External Lights (to replace 50W halogen lamps), without any compromise on the light intensity.

The Lobby is lit entirely with warm white (colour-82, 2700K) LED Lights.

Even the back-office areas are fully lit with LED Lighting; here, we have installed 300mm x 300mm LED downlighters with prismatic lens. These replace conventional CFL-based downlighters, providing a power saving of 80%. Since these areas are operating on a 24x7 basis, the annual savings on operating costs are phenomenal.

In the guest rooms and public areas, all the fluorescent tube cove lights of 36W have been replaced by our Colour-82 (2700K) Power LED Cove lights, effecting a total power saving of 24 Watts per light (65%) .

The kitchen area has been illuminated with LED Cleanroom fittings, which are completely sealed against ingress of dust and oil vapours.

The total power savings achieved for this hotel - including the saving in air-conditioning costs due to reduction in AC cooling load - is 100 Kilowatts of power, which with today's rising cost of power will result in massive annual savings in energy costs, and a payback within 1-1.5 years.

This is the first 'Green' hotel in India to be completely lighted with solid-state LED lighting, and we believe that it is the forerunner of a massive market to come.

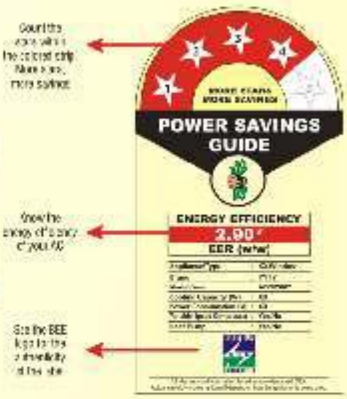
Vineet K. Rohatgi.
Director
Binay Opto Electronics
info@binayled.com

Don't let your electricity bill weigh you down

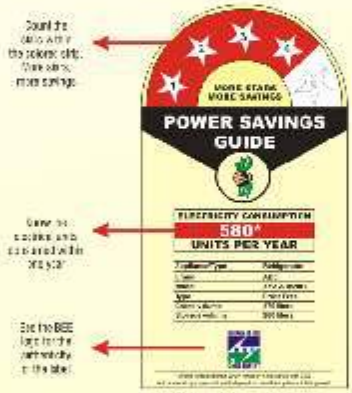
Always look for the BEE Label

Label For Electric Storage Water Heaters (Geysers)

Label For ACs

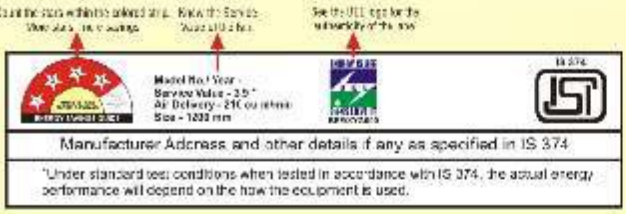


Label For Refrigerators



Label For TVs

Label For Ceiling Fans



Label For Tube Lights

Always look for the number of stars on the BEE label of your appliance.

Bring home only BEE certified electrical appliances. Rated according to the amount of electricity consumed by them, your savings increase with the number of stars on the label.

To know more please log on to: www.bee-india.nic.in

Bachat Ke Sitare Dost Hamare

BUREAU OF ENERGY EFFICIENCY
MINISTRY OF POWER, GOVERNMENT OF INDIA
4TH FLOOR, SEWA BHAWAN, R.K.PURAM, NEW DELHI - 110 066
www.bee-india.nic.in

continued from page 18

(blue light). Light with a large blue component (cool-white light) has therefore a larger non-visual biological effect than light with a large red component (warm-white light).

With the detection in 2002 of a novel photoreceptor cell type in the eye, the non-visual biological effects that light has on human beings can be better understood. The novel cell types are connected via a nerve connection with the biological clock (supra chiasmatic nucleus) in the brain. This clock in its turn is connected with the pineal gland. The non-visual influence of light and dark and thus of time works through the control of the biological clock which amongst others determines the production and suppression of hormones in the pineal gland. The sleep stimulating hormone melatonin is under the influence of this mechanism produced in the evening and night and suppressed in the early morning and during daytime. The hormone cortisol that gives energy to the body is produced in the morning and suppressed in the evening and night. During daytime we need much biological effective light and in the evening light with little biological effectiveness.

Incandescent replacement CFL and LED lamps have a clearly larger blue component than red component. Contrary, incandescent lamps have a larger red component than blue component. We have to ask ourselves therefore whether the domestic use of CFL and LED lamps in the evening disturbs our natural hormone balance and thus our natural body rhythm and health.

The total non-visual biological dose when using different lamps is calculated based on the a same light output (same visual dose). The results are compared with those of normal incandescent lamps. Here also the spectral age effect of the elderly is evaluated, both in terms of visual and non-visual biological effectiveness.

Spectral Properties of Incandescent, CFL and LED Lamps

The light of incandescent lamps is characterised by a continuous spectrum with relatively more red components (large wavelengths) than blue components (short wavelengths) (Figure 2). Incandescent lamps therefore give warm-white light (correlated color temperature ca. 2700K) with a color rendering index of 100.

CFL lamps give, just as tubular fluorescent lamps, light on the basis of a low pressure mercury gas discharge combined with the fluorescence principle. They don't have a continuous spectrum but one that is characterised by a number of sharp peaks (Figure 2). The choice of the fluorescent powder (phosphor) determines the spectrum and thus color properties. They are available in the color temperature range of 2700K (incandescent lamp color) to 6000K. Color rendering varies in dependence of the type between 65 and ca. 90.

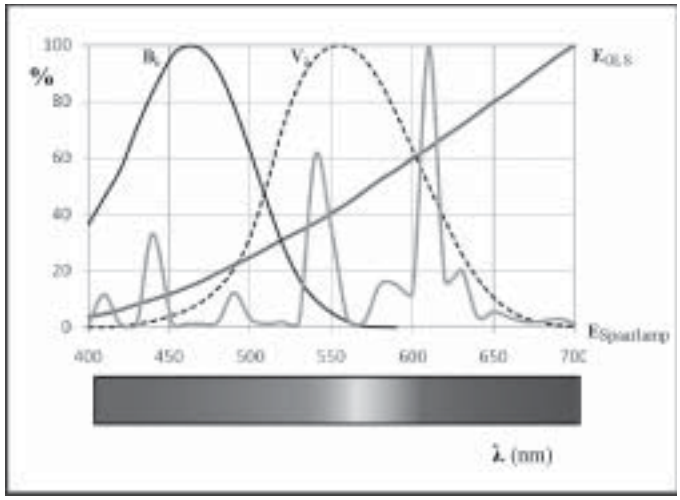


Fig. 2: *Relative spectral energy distribution (E) of an incandescent lamp (GLS) and a typical example of a CFL lamp with colour temperature 2700K together with the relative spectral sensitivity of the eye for photopic vision, V_λ, and for non-visual biological effects, B_λ, (biological action spectrum).*

Incandescent replacement LED lamps function on the basis of light generation in semiconductor material combined with the fluorescence principle. In the semiconductor itself blue light with a narrow spectral band around 450 nm is generated. Part of this light is transformed in a more or less continuous spectrum in the shorter wavelength area[1]. With cool-white LEDs (ca. 4000K) the blue peak in the spectrum at ca. 450 nm is still pronounced (Figure 3). With warm-white LEDs of a color temperature of around 2700 - 3000K this peak is reduced and the red component increases.

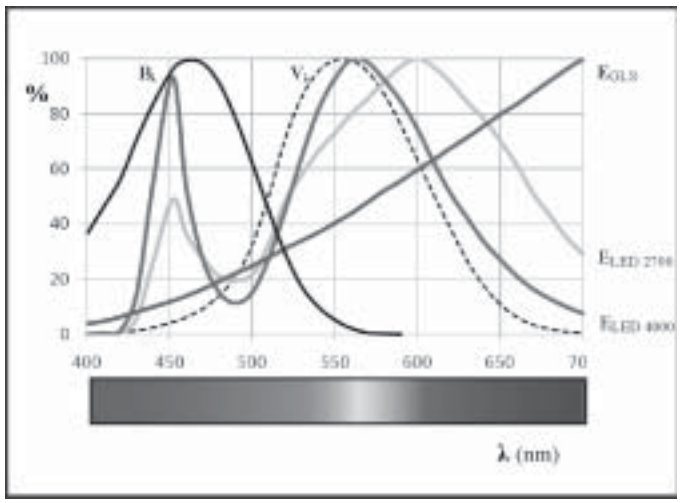


Fig. 3: *Relative spectral energy distribution (E) of an incandescent lamp (GLS) and a typical example of a LED lamp with colour temperature 2700K and one with colour temperature 4000K together with the relative spectral sensitivity of the eye for photopic vision, V_λ, and for non-visual biological effects, B_λ, (biological action spectrum).*

[1]Latest developments show that it is possible to produce in the semiconductor material itself directly white light so that phosphor powder is not needed. This development has not been taken into account in our present analysis.

Non-visual biological dose

The total non-visual biological effect of light (biological dose) can be calculated from the spectrum of a light source and the non-visual biological action spectrum as determined by Brainard on the basis of melatonin suppression during night [1]. In order to get a correct comparison for different light sources, this dose has to be calculated on the basis of light sources giving the same lumen output[2]. For this purpose the total lumen output is calculated from the relative spectral distributions according to:

Lumen Output (lamp) = Σ (E_λ (lamp) . V_λ).

Next all spectral energy values of a lamp are scaled to give the same lumen output according:

E_λ (lamp, same lumen output) = E_λ (lamp). LumenOutput (GLS) / LumenOutput (lamp).

Figure 4 shows the energy spectra of the incandescent lamp (GLS) and the two LED lamps on basis of a same photopic lumen output. For all other lamps taken into account, a similar calculation has been made.

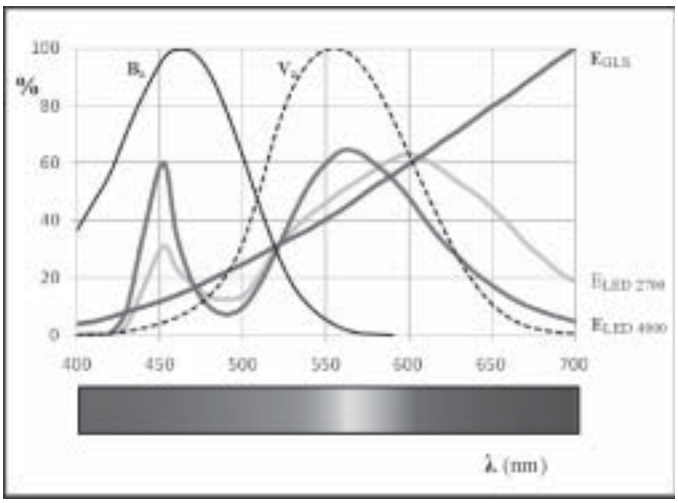


Fig. 4: *Relative spectral energy distribution (E) on basis of a same lumen output of an incandescent lamp (GLS) and a typical example of a LED lamp with color temperature 2700K and one with color temperature 4000K together with the relative spectral sensitivity of the eye for photopic vision, V_λ , and for non-visual biological effects, B_λ, (biological action spectrum).*

The "same lumen output spectra" are subsequently used to calculate the total relative biological dose according to:

Biological Dose (lamp) = Σ 100 . (E_λ (lamp) . B_λ)/Σ (E_λ (GLS) . B_λ.

Table 1 gives the values of the biological dose for the different lamps relative to the dose of an incandescent lamp.

[2]Since this often is not done in analysis described in the popular press, we often see wrong conclusions there solely based on the relative high peak values around the 450 nm area of LED lamps

	Visual dose basis V_λ (%)	Biological dose basis B_λ (%)	Biological dose basis Rea et al (%)
Incandescent lamp GLS	100	100	100
Halogen lamp	100	130,5	122,7
LED 2700K, Ra 80	100	99,0	101,8
LED lamp 2850K, Ra 90	100	92,9	100,0
LED lamp 4000K, Ra 65	100	133,8	137,0
CFL compact lamp 2700K, Ra 80	100	99,1	104,7
CFL compact lamp 4000K, Ra 80	100	134,1	130,1

Table1: *Total visual dose (lumen output) and biological dose (%) relative to that of an incandescent lamp at the same lumen output.*

Research has shown that Abney's law of additivity that holds for visual effects is not completely valid for the non-visual biological effects [2,3,4]. This means that the above given method to calculate the biological dose is not necessarily fully correct. The expectation however is that deviations because of this are not large. Rea et al [5] published an hypothesis in which they explain the non-additivity through an interaction of the cones, rods and noval photoreceptors in the retina. On the same basis they determined an alternative non-visual biological action spectrum. We have calculated the biological dose also based on this action spectrum and also given in Table 1.

Figure 5 shows the results given in Table 1 as a graph.

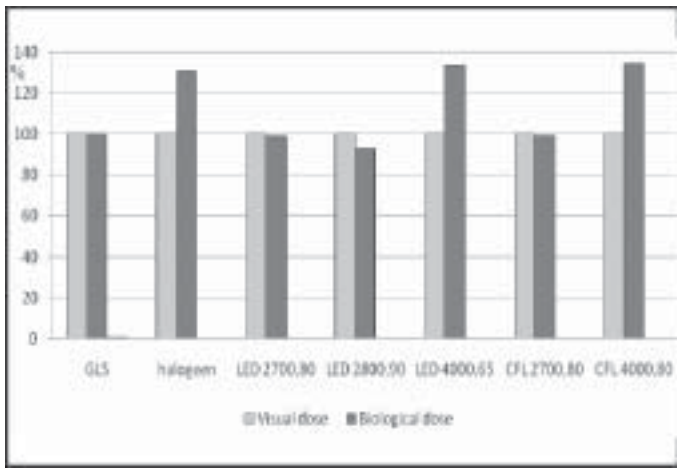


Fig. 5: *Total visual dose (lumen output) and biological dose (%) relative to that of an incandescent lamp at a same lumen output.*

The conclusion is that the biological dose with the use of warm white CFL and LED lamps of ca. 2700K - 3000K and good color rendering is the same or smaller than the dose obtained when using incandescent lamps. Cool white CFL and LED lamps of ca. 4000K result in a higher biological dose. It is interesting to note that use of halogen lamps, results in a clearly higher visual dose than incandescent and CFL and LED lamps of 2700 - 3000K.

Spectral age effects

The clear crystalline eye lens turns yellowish with growing age. Figure 6 gives the transmission of the eye

lens for the age group of 60 - 69 years relative to that of the age group of 20 - 29 years in dependence of wavelength. This spectral age effect has influence on both the visual and biological dose. Based on the equal light output lamp spectra the reduction in visual and biological dose for 65 years old persons relative to 25 years old persons has been

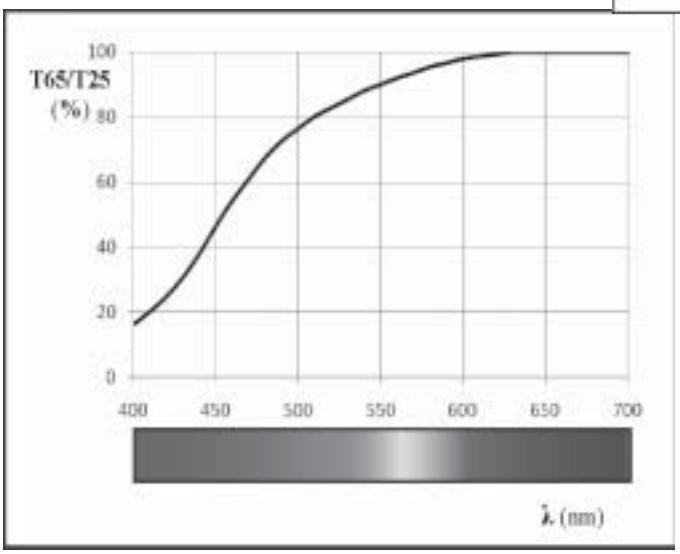


Fig.6: *Transmission of the eye of 65 years old persons relative to 25 years old persons, T65/T25, in dependence of the wavelength.*

	Visual dose (%)		Biological dose (%)	
	25 yr.	65 yr.	25 yr.	65 yr.
Incandescent lamp GLS	100	92,9	100	64,1
Halogen lamp	100	79,1	130,5	105,0
LED 2700K, Ra 80	100	64,6	99,0	60,8
LED lamp 2850K, Ra 90	100	62,2	92,9	51,3
LED lamp 4000K, Ra 65	100	52,2	133,8	101,4
CFL compact lamp 2700K, Ra 80	100	55,3	99,1	5 1 , 4
CFL compact lamp 4000K, Ra 80	100	55,2	134,1	1 0 6 , 4

Table 2: *Total visual and biological dose (%) of 25 year old persons and 65 year old persons relative to that of an incandescent lamp at equal lumen output (25 yrs).*

calculated. Table 2 gives the results.

Figure 7 shows the results in graphical form.

The more important effect is the lower visual dose with growing age, which in turn has a negative consequence for the visual possibilities of the elderly. The reduction is least with the incandescent lamp (7%). With the other lamps the reduction, for color temperatures

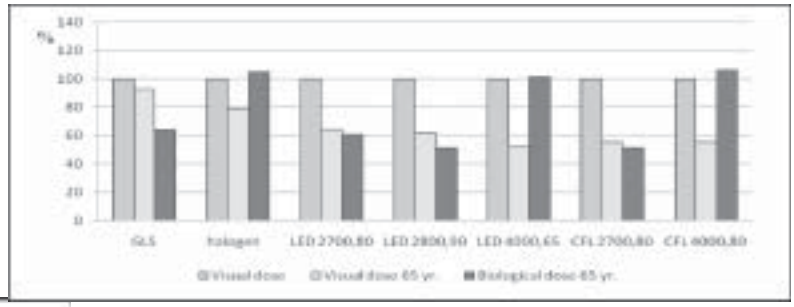


Fig.7: *Total visual and biological dose (%) of 25 year old persons and 65 year old persons relative to that of an incandescent lamp at equal lumen output (25 yrs).*

smaller than 3000K, varies from 21 to 38% and for color temperatures around 4000K from 45 to 48%. With the use of incandescent, CFL, and LED lamps of ca. 2700-3000K the reduction of the biological dose is stronger than the reduction of the visual dose. This means that compensation for the visual reduction by using higher output lamps has no negative consequences for the final biological effect.

Conclusions

As indicated earlier the discovery of the noval light sensitive cell that is so important for the non-visual biological effects only dates from 2002. Details of the mechanism behind non-visual biological effects are still being researched. We have for example discussed earlier in this paper that there probably is an interaction between this cell type and the cones and rods. As indicated, such interaction has an influence on the biological action spectrum. Future research results about this interaction and about other details of the mechanism can lead to nuances in the conclusions that we give below.

Effects on body rhythm and health

In the evening we should use biologically ineffective and visual effective light. On the basis of equal lumen output our calculations show that when using warm white CFL and LED lamps of ca. 2700 - 3000K and good color rendering the total biological dose received is equal or smaller than when using incandescent lamps. Changeover from incandescent lamps to these more energy friendly alternatives has no extra disturbing effect on our natural body rhythm and thus not on our health.

Cool white CFL and LED lamps of ca. 4000K do result in a higher biological dose, ca. 34%. Also halogen lamps do result in a higher biological dose, ca. 30%.

Age effect

The spectral age effect reduces the visual dose for elderly which has a negative consequence for their visual capabilities. Where this reduction with an incandescent lamp is ca. 7 % and with an halogen lamp ca. 21%, the reduction with LED lamps of 2700 - 3000K is ca. 35 to 38%. With the use of CFL lamps (both 2700 and 4000K)

and the LED lamp of 4000K the reduction is strongest up to 48%. Also the biological dose reduces because of this spectral age effect, in the case of incandescent, CFL and LED lamps of 2700 - 3000K stronger than the reduction in visual dose. With compensation of the visual loss through the use of higher output lamps, the total biological dose remains under the original 100% (basis: incandescent lamp, young persons). Also for the aging eye the use of CFL and LED lamps of ca. 2700 -3000K is not more harmful than the use of incandescent lamps.

It is still unknown in how far the retina, photo receptors and the brain itself perhaps adapt themselves to the changing transmission of the aging eye.

Acknowledgments

The author is grateful to Prof. Dr. Domien Beersma (University of Groningen) and Dr. Luc Schlangen (chairman of the Dutch Foundation "Research in Lighting and Health", SOLG) for their valuable comments.

References

[1] Brainard, G.C.; "Photoreception for regulation of melatonin and the circadian system in humans", fifth International LRO Lighting research symposium, Orlando, 2002.

[2] Rea, M.S.; Bullough, J.D; Figueiro, M.G.; Bierman, A.; "Spectral opponency in human circadian phototransduction: implications for lighting practice", Proceedings of CIE Symposium Lighting & Health, Vienna, 111-115, 2004.

[3] Mure, L.S.; Rieux, C.; Hattar, S.; Cooper, H.M. ; "Melanopsin-dependent nonvisual responses : evidence for photopigment bistability in vivo", Journal of biological rhythms, Vol. 5, 411-424, 2007.

[4] van Gelder, R.N.; Mawad, K.; "Illuminating the mysteries of melanopsin and circadian photoreception", Journal of biological rhythms, Vol. 5, 394-395, 2007.

[5] Rea, M.S.; Figueiro; M.G.; Bullough, J.D.; Bierman, A. ; "A model of phototransduction by the human circadian system", Brain Research Reviews, Vol. 50, 213-218, 2005.

[6] *CIE Publication, 158*. Ocular lighting effects on human physiology and behavior. Vienna, 2004.

Prof. Ir. Wout van Bommel
Van Bommel Lighting Consultant
www.woutvanbommel.eu
February, 2010

Impact of Self-Sustainable Rural Household Lighting - Case Study of a Typical Indian Village

Radhakrishna Subraya Aithal, Chandrashekara S. Adiga, Anantharam Patil Saralebettu

Abstract

In the wake of fast depleting conventional energy resources and alarming environmental pollution, efficient energy management has become a hot topic and main concern of every responsible individual. Electrical energy plays an important role in the overall development of any country, in improving the quality of life and hence, in enhancing the Human Development Index. But, in India, despite substantial rural electrification programmes, there are still 80,000 villages unelectrified, most of them are in remote areas where it is highly expensive to extend the conventional electric grid. So, the all round development of the rural tribal community, living below the poverty line, has remained a dream only. Harnessing renewable energy sources for cooking, lighting and other amenities in such tribal villages is the basic need of the hour. Solar photovoltaic (SPV) systems have emerged as useful power sources for applications such as home lighting, street lighting, water pumping etc. - a revolutionary breakthrough in rural community development.

With this background, an attempt is made to bring in energy securities in the villages and to study the useful impact of replacing kerosene oil lamps with SPV lights, the light for life. The present paper focuses on the methodology adopted for implementation of this "Light for Life" charity project in a selected Indian village and the outcome of the periodical investigations carried out on the useful impact of a shift from near darkness to brightness. It is believed to be first of its kind in India that an academic institution is actively involved in the development of local rural community through this type of Green-Light project.

Keywords: Renewable-energy, Solar-lighting, Village, Community-development, Energy-security

1. Introduction

"In India, there is 7.5% Energy shortage and 11% peaking shortage at present. More than 40% of the people do not have access to electricity for most of the day, especially in rural areas and this remains a major challenge" admits Sushil Kumar Shinde, the Union Power Minister of Government of India. According to the annual reports of Ministry of New and Renewable Energy (MNRE) and Bureau of Energy Efficiency (BEE), the Government of India, despite substantial Remote Village Electrification (RVE) programs under Integrated Rural Energy Program (IREP) schemes, nearly 80,000 Indian villages still remain unelectrified.

On the other hand, the measure of development in any society/country in these days is synonymous with quantum of energy consumption. In this era of rapid industrialization, if India is seeking to move into an 8 to10% economic growth trajectory, then there should be no power shortages anywhere. In this direction, the Government of India is focusing on adding generating capacity on a war footing by inviting foreign and private companies to invest in the power sector. The problem, however, is the long lead times (approximately 6 to 8 years) and the continuously escalating cost of setting up new

generating capacity with a significant foreign exchange component. Notwithstanding the above, the new generating capacity will put further pressure on the scarce, non-renewable energy sources and add to the existing high levels of pollution and damage to the environment. So, the need of the hour is proper demand side and resource management [1]. It is therefore evident that harnessing energy from renewable sources for sustaining the energy requirement by human beings is highly called for.

2. Rationale behind the investigation

There is only a little doubt that direct correlation exists between the level of economic development of any nation and their consumption of energy. The Human Development Index (HDI), the parameter introduced by the United Nations Development Program (UNDP) in 1990, is one way of measuring how well the countries and specially, the developing countries are meeting not just the economics, but also the social needs of their people. The composite HDI value that combines the variable indicators of life expectancy, health and educational progress and per capita income, is of the order of 0.6 for India (on a scale of 0 to 1). UNDP has proposed a number of suggestions to improve the HDI value among which improving per capita energy consumption for illumination stands significant [2]. As a result of interactive survey work carried out by various agencies and Non-Government Organizations (NGO) in the rural belt of India, the aforesaid basis has shifted to per capita illumination level per unit of energy consumed. If this has to be improved especially in the rural, remote, unelectrified areas, the viable solution is harnessing renewable energy sources for household lighting.

Fig. 1. Typical village house for case study

Many of the regions in rural India are completely off-grid (around 46%), others are connected to the grid but have intermittent or no supply, so there is a real need for these consumers to find alternative power solutions. The Solar Home Lighting Systems (SHLS) provide reliable power for lighting and other low power appliances such as fans, radios and televisions [3]. In many situations, particularly in very small and very remote villages, no other renewable energy option except SPV home lighting systems may prove to be feasible [4]. On the other hand, nearly 80 million people in Indian villages light their houses using kerosene oil. This smoky and carbon intensive fuel is dangerous to health and despite being subsidised, consumes nearly 4% of a typical rural Indian household's budget. A recent report by the Intermediate Technology Development Group states that indoor air pollution from such lighting media results in approximately 1.6 million deaths worldwide, every year!

Keeping all the above points in view, the studies carried out periodically to assess the useful impact of providing safe and eco-friendly light and its role in changing the life style and causing all round development of the rural community, are appropriate and relevant in the Indian context.

3. Methodology of implementation

3.1 Project background

Some villages have been identified in Udupi District of Karnataka State where still many houses are unelectrified. People still depend on kerosene oil to ignite lamps and the studies of their school going children are severely impaired. In the first phase of the project, a Scheduled Caste (SC)/Scheduled Tribe (ST) Colony of Banglegudde, Aroor-Kurudunje village is selected for the case study (Figures 1 & 2). In this colony, there are 12 unelectrified, mud and clay houses with a total population of around 80. Conventional electric grid may not enter this village in the near future. Till two years ago, life in this humble village surrounded by forests would come to a grinding halt after sunset. The elders in the families were doing occasional labour work, selling firewood from the forests and earning hardly on an average, Rs.50 to 60 per day. Their enthusiastic children, going to the local schools and even colleges, were managing their studies in the dim, smoky glow of kerosene lamps. Their monthly income was so low that even if electrified, they were unable to pay the monthly electricity bill. Their house construction is such that even on bright sunny days, there is only darkness inside.

Having identified such a poor community, as a first step towards their all round development, 20W Solar Home Lighting Systems (SHLS) with Compact Fluorescent Lamps (CFLs) were installed in all these houses, free of cost (Figures 3 & 4). This is done as a part of the research project entitled "Studies on the Energy Securities in Tribal Villages of Udupi District, Karnataka", sponsored by Indian Society of Lighting Engineers (ISLE) through the donation received from wellknown industrialist, Suresh H. Shah of Asian Electronics Ltd. The first author of this paper is the Principal Investigator of this 'Light for Life' charity project. Solar Electric Lighting Company (SELCO), Bangalore has installed the SHLS.

The SHLS provided in the houses of Banglegudde can provide continuous bright light for four hours from sunset onwards. But that's enough for the villagers to get their work done in the early hours of night and it is more reliable than light generated off India's electric grid. The

Solar PV panels have a life of minimum 25 years and the storage batteries, 8 years.

Fig. 2. Solar panel on the tiled roof

The highly energy efficient and long life CFLs provide an average illumination level above 150 lux in these houses. The ecological benefits of CFLs are also noteworthy. It not only consumes just one fifth as much energy as an incandescent bulb but also halves the atmospheric discharge of carbon dioxide and reduces sulfur dioxide emission considerably. Furthermore, the mercury content in CFLs is tiny (less than 3 mg) and poses practically no environmental threat. Also the replacement life of a CFL is 8 years (on an average) as against 8 to 10 months for an incandescent lamp [5].

Today, in the poor SC/ST colony of Banglegudde, the life scene is totally changed. "Children can now study till late in the night, elders can manage their chores better" says Mrs. Girija Bai, mother of three children, going to high school and college. In the neighboring electrified village, Chanthar, the newly installed SHLS has become a subject of envy. Those who are connected to the electric grid in Chanthar are facing daily power cuts up to 6 to 8 hours, adversely affecting the studies of their children in the night time. SHLS require far less maintenance, have longer life and as the residents of Banglegudde say, 'Zero Electricity Bills'! They are trained now by SELCO officials to carry out the routine maintenance of SHLS for increasing their life and maintaining desired performance. They have taken up this maintenance aspect seriously, lest they be thrust into darkness again. The villagers don't fail to acknowledge how this project has lit up their dark lives and reversed their fortunes.

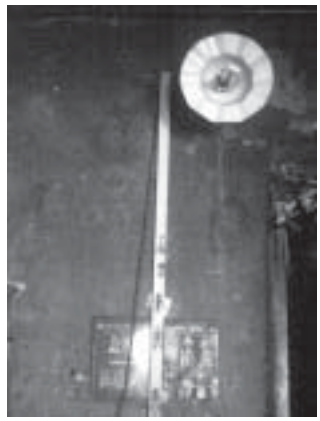


Fig. 3. SHLS installed in the

3.2 Impact study and analysis

Studies were carried out periodically by the investigators on the useful impact of replacing kerosene oil lamps with Solar Photo Voltaic lights, a shift from

Table 1 *Periodical impact study report (2007-2008)*

Description of Human Development Index Parameters Studied	Observations
1. Fuel Savings :	
Cost of Kerosene oil used (subsidised) / month before installing Solar Lights	Rs. 60/- (a family of 5 members)
Cost of Kerosene oil used / month after installing Solar Lights	Rs. 10/-
Monthly savings in the cost of Kerosene oil	Rs. 50/-
Monthly reduction in the fuel consumption	5 liters of Kerosene oil
2. Educational Promotion :	
No. of hours of studies before installing Solar Lights	1 hour
No. of hours of studies after installing Solar Lights	2.5 hours
Increase in the no. of hours of studies	2.5 times
Impact on the academic performance	Reading habit / handwriting skills improved. Class / Percentage of Marks, increased
3. Time Management & Family Income :	
No. of hours of working in the night time before installing Solar Lights	Maximum one hour
No. of hours of working after installing Solar Lights	3 hours
Increase in the working hours of elders	2 hours
Purpose for which these increased working hours used	Minor carpentry works and stitching clothes
Any increase in the monthly income reported ?	Yes
4. Health Promotion :	
Any Respiratory / Heart / other health problems reported before installing Solar Lights	Children and even elders facing frequent coughing / breathing problems
The health problems reported after installing Solar Lights	Rarely.
Any decrease in the health problems reported?	Yes
5. Other Parameters :	
(i) Whether solar lights are used in the day time also? Reasons :	Yes. In kitchens, as insufficient day light enters the house.
(ii) Whether the bed-time got extended as compared to that before ?	Yes, by 2 hours at least.
(iii) Any improvement in mutual cooperation / unity among the residents of the colony reported ?	Yes
(iv) Any improvement in the social behaviour / life-style / character of the house members reported ?	Yes. Conduct & character of Mr. Chonglu has improved a lot.
(v) Through solar operated mass media, any exposure to global information / awareness reported ?	Yes, using 6V radio set & 12V portable TV
(vi) Any cost savings on battery cells used earlier for item (v) reported ?	Yes, minimum Rs. 60/- per month saved.

near darkness to brightness. After providing these solar lights, the progress in the constructive activities of the family members/children, fuel savings/monthly savings in the cost of kerosene oil, improvement in their health, progress in the studies of their children, progress in the creative workmanship of the house members, enhancement in the working hours, mutual cooperation and relationship, improvement in family income, better utilisation of time/effective time management and the like parameters of Human Development Index were analysed and assessed. Table1 shows the format in which periodical impact study report was prepared, along with sample data collected.

Fig. 4. CFL fixture with charge

The investigators have made regular visits (once in a month) to the project site in arriving at the above observations. The outcome of the project implementation and impact studies are summarized in the following section.

4. Outcome of the case-study

After analysing the periodical impact study reports collected over one year, the following significant results are extracted :

- Monthly savings in the cost of kerosene oil, of the order of a day's earnings of an individual, is observed. "Now the money saved goes into children's education" says Mrs. Jalaja, who heads the family of 7 people with 4 children going to Primary and Secondary Schools.
- Fuel consumption on lighting (Kerosene oil) has reduced drastically (as much as 4 to 5 times than earlier). Green house gas emission is reduced. Energy Conservation is taking place.
- Number of hours of studies by the school going children is doubled. Their academic performance has improved. Two children in the colony have managed to enter their Bachelor's Degree level studies now.
- Number of constructive working hours in the night time is more than doubled. Family income is increased with extra work done / products sold.
- Respiratory disorders and other related health problems are reduced. Food intake by the children is improved. Overall progress in the family health is recorded.
- With increased family income, savings in the form of Recurring Deposits at the local Post Office is reported.
- With the given Solar power outlets and adaptors, 6V radio and portable 12V televisions are used in some houses. Families are exposed to global news/awareness/entertainment. Their general knowledge level has improved. Money savings on battery cells used earlier, is also reported.
- Abstaining from alcoholic addictions/other bad habits is reported from some family members. Those families are saved and overall social behavior has improved in this village.

In a nut-shell, all the three major variables that affect HDI, viz. educational attainment, prosperity and life expectancy are improved after the implementation of this "Light for Life" project. So, if this type of project is extended to many more remote villages of India, there is no doubt about reaching expected economic growth and socio-economic development of the country.

5. Future plans

With the success of the implementation of this tiny project, there are plans to extend it to the new community hall coming up in this village. With this, useful guidance and training on personality development, effective use of global information, energy awareness, the need and benefits of environmental protection, unity in the community, abstaining from alcoholic addictions and bad habits etc. can be imparted effectively to the poor community.

There is also a plan to extend this type of Green-Light project employing Solar powered LEDs (in place of CFLs) lighting systems to other unelectrified, remote villages in the state, living below the poverty line, provided enough financial support is obtained from industries and organisations. An attempt is being made in this direction.

6. Conclusions

Today, in the poor tribal colony of Banglegudde, 'darkness' is vanishing. 'Brightness' is arising. 'Hopes' are unfurling. 'Life' is flourishing. All these could happen because of bringing 'light' to their 'life' through this 'Green Light' project.

According to National Rural Electrification Policies 2006, the goal of the nation includes quality and reliable power supply at reasonable rates and minimum lifeline consumption of one unit/household/day as a merit good by the year 2012, to all rural households [4]. The implemented 'Light for Life' project is a tiny and humble contribution in this direction and towards causing socio-economic development of the country and improving the HDI value of India.

The world's 2 billion users of fuel based lighting collectively consume significant amounts of energy and

emit large amounts of green house gases. The concept of carbon credits came into existence as a result of increasing awareness of the need for environmental pollution control, world wide. Carbon credits create a market for reducing Green House Gas (GHG) emissions by giving a monetary value to the cost of polluting air. As the Kyoto Protocol is implemented, there is greater interest in decreasing carbon dioxide emissions. A shift towards solar powered home lighting systems should provide substantial cost and emission savings and possibility of earning carbon credits (carbon trading). So, as far as lighting is concerned, the effective way to reduce GHG emissions and earn out of carbon credits is to replace kerosene lamps with solar powered home lighting systems, in developing countries like India.

References

1. Radhakrishna S, Ghosh B, Mazumdar S. (2000). Demand Side Management Programmes on Lighting : An Effective Means Towards Energy Saving in Indian Context - A Review, J Institution of Engineers, India, 80(4), 166-169.
2. Mukherjee D, Chakrabarti S. (2005). Fundamentals of Renewable Energy Systems. 2nd Ed. Kolkata: New Age International.
3. Devyani Hari (2007). Green Power - Lighting up Rural India, <http://www.hedon.info/docs/BP53-Hari-4.pdf >
4. MNRE (2006). Ministry of New & Renewable Energy, National Rural Electrification Policies 2006, <http://www.mnes.nic.in/prog-rvlp.html>, New Delhi: MNRE
5. Aizenberg J B, Rozhkova N V, Fedyukina G V. (2001). Evaluation of Promising Energy Efficiency of Lighting Installations in Russia, J Light & Engineering (Svetotekhnika), 3, 9-12

Authors

Radhakrishna S. Aithal
drsaithal@gmail.com

Chandrashekara S. Adiga
adigacs@yahoo.com

Manipal Institute of Technology
Mampal, India
and
Anantharam P. Sarakbettu
Patila@hallcow.com
Halcrow, Global Technology (Lighting)
Iharjah U. A. F.

Note : This Paper was presented at the 11th Lux Europa Conference in Istanbul last year.

Eco Approach for the Indian Lighting Industry

Avinash D. Kulkarni

The past three years have witnessed colossal changes in the lamp industry; the first and the foremost being the ban of the Incandescent (GLS) Bulb in several countries in a phased manner. The 100 W GLS has been banned in UK in 2008 and then in the European Union in September 2009. The entire GLS lamp range, a lamp which is present in every house today, will be totally banned in Europe Union and many other countries by September 2012. Such a ban of GLS is unthinkable in India where over 30% households have yet get an electric connection. The Compact Fluorescent Lamp (CFL) which is recommended for replacing the GLS has problems of its own, more so in India because of large voltage fluctuations in the power supply in most parts of the country. Large fluctuations in supply voltage lead to shorter life of CFLs, leading in turn to a serious waste disposal problem of the mercury containing Discharge Tube (DT) and its electronic ballast.

In this paper several suggestions have been made for designing products which are best suited for the Indian scenario. These include banning higher wattage GLS, redesigning lower wattage GLS, adopting new standards for 1000W and 500W halogen lamps, creating standards for CFLs with limited wattage selection and separating the DT from the ballast, and replacing electromagnetic HID ballast by electronic ballasts. In doing so one has to keep a close watch on the rapidly emerging LED technology to look for solutions to any of these stated problems.

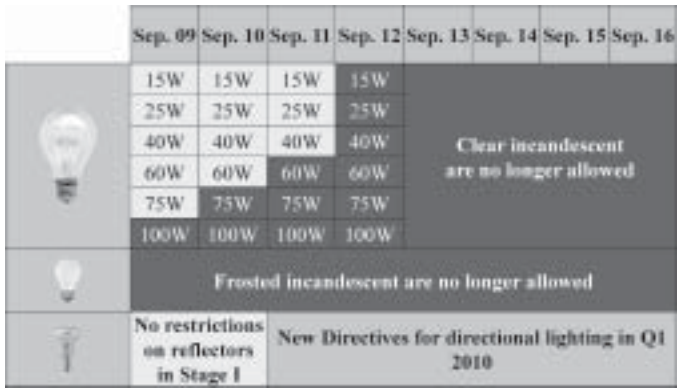
GLS Bulb

The first foremost, all GLS bulbs of wattage 100 and more need to be discontinued. As per ELCOMA estimate this will lead to 40% reduction in energy currently being consumed by GLS lamps.

The technology of Incandescent lamps is very well understood. The relationship of lamp efficacy (lumen/watt), life and the nature of fill gas (and its pressure) is well documented. An illustration of the improvement in efficacy of an incandescent lamp by use of heavier inert gas and also by increase of fill pressure is given in the adjoining table. Since in the GLS bulb one can not use fill pressure higher than atmospheric, one can only select the gas which gives the best efficacy-life combination.

Other heavier inert gases are krypton and xenon which roughly cost about Rs.40 and Rs. 400 per litre respectively,

EuP Directive on Domestic Lighting
Phase out *Incandescent Lamps*



EFFICACIES OF 500W INCANDESCENT LAMP

Lamp	LPW	Life in Hr	Gas fill
STD GLS	16.4	1000	Argon,1 atm
STD GLS	14.8	2000	Argon, 1 atm
STD HALOGEN	18.4	2000	Argon, 2.5 atm
Kr HALOGEN	20.0	2000	Krypton,2.5 atm
Xe HALOGEN	22.0	2000	Xenon, 3.5 atm
Xe HALOGEN	25.0	2000	Xenon, 3.5 atm + IR reflecting coating

as compared to the 20 paise per litre for argon. The very high cost of xenon gas makes it impossible to use it in GLS bulbs. Argon with about 10% nitrogen is currently used in GLS bulbs and could be replaced by krypton + 10% nitrogen to gain about 8% in efficacy.

In India A60 bulbs are used in all lamps as against A55 in Europe. If we limit GLS lamp wattage to 54W we might be able to use A45 bulb; this could be new standard for India. The volume of A45 being less than half of A60, will reduce the krypton cost to less than Rs. 2 per bulb and at the same time drastically reduce costs of glass, transportation and storage. Similarly 40W GLS could be replaced by 36W. This change will result in a modest 10% reduction in energy consumption by low wattage GLS bulbs.

Thus by banning 100W and higher wattage lamps and by 10% wattage reduction in the rest of the bulbs, 50% of the energy currently consumed by GLS could be saved without banning all GLS bulbs.

Since halogen lamps are the super compact version of bulbs, use of krypton and xenon at high pressure is more practical in them. The rated wattages of widely used 500W and 1000W halogen lamps could be reduced in two stages: first by 10% by krypton fill and then by 20% xenon gas fill in second stage. Life and lumens need not be compromised in making these changes.

CFL Lamp

When CFLs were launched in India in early eighties, they were in two parts: Discharge Tube (DT) and detachable ballast. This concept of non-integral CFL is still being used in some down lights and DTs are still available and so are detachable ballasts. In the past two decades integral DT - electronic ballast design has taken over and perhaps more than 99% CFLs sold are of integral design. The cost pressure on integral CFL is so intense that the quality of electronic ballast in most cases is not up to the mark and particularly with wide voltage fluctuations in the supply voltage in India, resulting in low lamp life. As a consequence, both the consumer and the environment suffer.

CFLs are available in a large range of wattages, from 5W to 23W. If we limit CFL DT wattages to say 10W and 20W and design high quality electronic ballasts which will operate lamps, at a specified wattage even if the supply voltage varies from say 160V to 260V, we will have a combination which should have long DT life and even longer ballast life, perhaps 50,000 hours. With this scheme of things, a consumer has to change only the DTs, costing perhaps just Rs. 25, less frequently than the current CFLs and the need for ballast change could even be once in ten years! That would lead to a drastic reduction in the number of discarded lamps and ballasts. This "new" CFL design being India specific, the Indian CFL market will be largely available to the Indian manufacturers. That would be a truly win-win-win situation for the consumer, the environment and the manufacturers.

HID Lamp

Since the introduction of MH lamps, the HID lamp market has expanded considerably. Although their major market is still for outdoor and high bay lighting, they are now widely used in interior lighting, largely replacing halogen lamps. Magnetic ballasts consume 15 to 20% of the rated energy of a HID lamp, and the use of electronic ballast could cut this to about 2%. In the Indian environment where supply voltage fluctuations are large, electronic ballasts, besides reducing power consumption, could also improve lumen maintenance as well as the lamp life.

FTL Lamp

The best possible FTL, tri-phosphor T8 and T5 lamps, are already available in the Indian market. Although the efficacy of T5 is marginally higher than tri-phosphor T8, the former can only be operated on electronic ballast while the latter could be used with both magnetic and electronic ballasts. What makes tri-phosphor T8 even more attractive is that it could be used in all existing regular T8 and T12 FTL fittings and raise lighting levels by 33%. A typical Indian home is rather poorly lit and FTL is the work horse of domestic lighting. A 33% improvement in the lighting level for several thousand hours by paying merely Rs. 25 as the additional cost the of light source is an excellent value proposition. Unfortunately, the outstanding value that the tri-phosphor offers is hardly known in the market place and it continues to be a laggard in sales in spite of its launch more than a decade ago.

The T8 tri-phosphor FTL has a BEE rating of Four Star. It is a light source which is the best value for money and therefore needs to be promoted aggressively.

LED Lamp

The LED is a very rapidly emerging light source of immense potential. It has established itself as an

outstanding value in several niche applications such as, traffic signals, special effects in interior lighting, façade lighting, etc. LEDs, could in the near future replace some, or as some LED enthusiasts claim, all the above light sources. One has to keep close watch on LED developments.

In a very rapidly changing scenario in the lighting industry globally the Indian lighting industry has to change. It also can not blindly emulate initiatives of developed countries, such as banning all GLS lamps by the year 2012. Yet the India lighting industry has to evolve its own strategy, commensurate with its economic and power supply situation. All concerned parties, such as ISLE, ELCOMA, BEE, BIS, and others have to work together and this paper could be used as the first draft for the discussion.

Avinash D. Kulkarni
President, Indian Society of Lighting Engineers
and
Chairman
Litex Electricals Pvt. Ltd
Litel Infrared Systems Pvt. Ltd
Arklite Speciality Lamps Ltd
dradk@hotmail.com

WEBWATCH

Origami Lamps

Using the Origami style of Kusudama, the folded paper ball is created with a multitude of colors and styles. Light-weight, durable, decorative and unique. Using a compact fluorescent bulb, the lamp is sustainable and energy efficient. It creates an ambient mood of diffused colors and textures.

LINK :

http://www.etsy.com/view_listing.php?listing_id=23892404&ref=cat1_gallery_3

About Origami

http://anools-origami.tripod.com
http://www.origami-mitra.com

___

Pitt Study: City Should Install LED Streetlights

Choosing new technology over old, a University of Pittsburgh study recommends that Pittsburgh replace its 40,000 streetlights with LED lighting.

The 72-page study, "Life Cycle Assessment of Streetlight Technologies," by Pitt's Mascaro Center for Sustainable Innovation, says electricity savings from light-emitting-diode – or LED – lighting would offset negative environmental impacts of the LED manufacturing process by a factor of 10.

That means the city, which spends $4.2 million annually on electricity and streetlight maintenance, could save $1 million each year in energy costs and $700,000 in maintenance costs with LED lighting.

In the study led by Melissa Bilec and Joe Marriott, Pitt reviewed manufacturing, use and disposal of housings, plus raw materials, bulbs and power in evaluating the four technologies. While LED contains fewer harmful materials than the others, its manufacturing process is more energy intensive. The study's evaluation also included recycling issues and disposal of used bulbs, known as lamps.

Induction lighting, an older technology and LED's chief competitor, already has reached its peak of efficiency. The study compared LED lighting with computer chips in projecting increases in efficiency and cost reductions for years to come.

LINK :

http://www.post-gazette.com/pg/10018/1029038–53.stm

___

Brainwaves to Control Light

Along with the figure skating, ice hockey and snowboarding, another event will compete for attention at the Winter Olympics in Canada this month.

A Canadian company has created what it calls the "largest thought-controlled computing installation." It's an experiment that lets visitors to the Olympics use their brainwaves to control the lights at three major landmarks in Canada, including Niagara Falls.

"When people put on the headsets and find themselves increasing the brightness of the lights by just thinking about it, you can almost see their brains explode," says Trevor Coleman, chief operating officer for InteraXon, the company that has created this installation.

LINK :

http://www.wired.com/gadgetlab/2010/02/thought-controlled-lights/?utm_source=feedburner&utm_medium=feed&utmcampaign=Feed%3A+wired%2Findex+%28Wired%3A+Index+3+%28Top+Stories+2%29%29
http://snipurl.com/uf2ii

___

LEDs Transfom Night Sky

MIT's Flyfire, a project initiated by the SENSEable City Laboratory in collaboration with ARES Lab (Aerospace Robotics and Embedded Systems Laboratory) has developed LED powered helicopters, or smart pixels to transform the night sky into an art gallery.

In its first implementation, the Flyfire project sets out to explore the capabilities of this display system by

using a large number of self-organizing micro helicopters. Each helicopter contains small LEDs and acts as a smart pixel. Through precisely controlled movements, the helicopters perform elaborate and synchronized motions and form an elastic display surface for any desired scenario.

With the self-stabilizing and precise controlling technology from the ARES Lab, the motion of the pixels is adaptable in real time. The Flyfire canvas can transform itself from one shape to another or morph a two-dimensional photographic image into an articulated shape. The pixels are physically engaged in transitioning images from one state to another, which allows the Flyfire canvas to demonstrate a spatially animated viewing experience.

Flyfire serves as an initial step to explore and imagine the possibilities of this free-form display: a swarm of pixels in a space.

LINK :

http://senseable.mit.edu/flyfire/#

Thane to get LED Streetlights

Thane will soon get a modern system of streetlights, thanks to a recent civic proposal. The TMC is waiting for the clearance of the proposal from the union government before seeking the approval of its own hothouse to kick start the project.

Informed civic sources told that the electrical department is toying with the idea of providing street lights based on light emitting diode (LED) devices. The technology is termed green technology as it involves least harm to environment. The LED technology is used by several nations abroad.

As per the proposal, the TMC wants to put up at least 300 streetlight poles based on the new technology in the coming months. Two leading roads in the city are being shortlisted for the ambitious proposal on an experimental basis.

Although the technology is highly successful the experiment would continue for a few months to evaluate the results. The electrical department will modify the mechanism to make the best possible use of the technology to reap maximum benefits from it. The technology would then be extended to the roads and public places in the entire city in a phased manner.

LINK :

http://timesofindia.indiatimes.com/city/thane/Thane-to-soon-get-LED-streetlights/articleshow/5518327.cms

Tennis court Lit with LEDs

Tennis club 'Volley' in Eindhoven, the Netherlands, is the first in the world to employ a fully LED illuminated tennis court. The lighting system is dynamic and complies with all relevant standards for luminosity per surface area. There are also plans to install LED lighting at selected hockey and football grounds shortly.

LED lighting for sports venues not only results in energy savings due to lower power consumption (typically 30-40%.). In practice the savings can be as high as 50% because the LED masts can be switched on and off instantly, as opposed to traditional lamps. Dimming is also possible. Consequently the warm up and cool down periods are eliminated resulting in no more brightly illuminated fields not actually used. LED lighting also has the advantage of being directional, causing less stray light in the direct surroundings of the sports ground, arena or tennis court.

LINK :

http://www.elektor.com/news/world-s-first-tennis-court-with-led-lighting.1251280.lynkx?utm_source=UK&utm_medium=email&utm_campaign=news

---

Soccer Ball turns Kicks to Light

Soccer is one of the most popular sports in the world partly because it requires so little: a ball and some space to play is all you really need. And because of that, it's extremely popular in third world countries. Now, the Soccket has arrived to make soccer a helpful addition to the places its played.

The Soccket uses an inductive coil mechanism inside to save up all that kinetic energy used kicking it around. It can then plug in and charge an LED light using that energy. About 15 minutes of play can provide 3 hours of charge, which seems pretty reasonable to me. A great idea, and one that will definitely help people in need.

LINK :

http://dvice.com/archives/2010/02/energy-gatherin.php

New Material to make Lighting Cheaper

Super material will make lighting cheaper and fully recyclable

With the use of the new super material graphene, Swedish and American researchers have succeeded in producing a new type of lighting component. It is inexpensive to produce and can be fully recycled.

The invention, which paves the way for glowing wallpaper made entirely of plastic, for example, is published in the scientific journal ACS Nano by scientists at Linköping University and Umeå University, in Sweden, and Rutgers, The State University of New Jersey.

Ultra-thin and electricity-saving organic light diodes, so-called OLEDs, have recently been introduced commercially in mobile phones, cameras, and super-thin TVs. An OLED consists of a light-generating layer of plastic placed between two electrodes, one of which must be transparent. Today's OLEDs have two drawbacks - they are relatively expensive to produce, and the transparent electrode consists of the metal alloy indium tin oxide. The latter presents a problem because indium is both rare and expensive and moreover is complicated to recycle. Now researchers at Linköping and Umeå universities, working with American colleagues, are presenting an alternative to OLEDs, an organic light-emitting electrochemical cell (LEC). It is inexpensive to produce, and the transparent electrode is made of the carbon material graphene.

LINK:

http://www.alphagalileo.org/ViewItem.aspx?ItemId=67625&CultureCode=en
http://snipurl.com/uf3ns [www_alphagalileo_org]

Lack of Morning Light Keeping Teenagers Up at Night

First Field Study Shows Lack of Exposure to Morning Light Delays Sleep in Teens

The first field study on the impact of light on teenagers' sleeping habits finds that insufficient daily morning light exposure contributes to teenagers not getting enough sleep.

"As teenagers spend more time indoors, they miss out on essential morning light needed to stimulate the body's 24-hour biological system, which regulates the sleep/wake cycle," reports Mariana Figueiro, Ph.D., Assistant Professor and Program Director at Rensselaer Polytechnic Institute's Lighting Research Center (LRC) and lead researcher on the new study.

"These morning-light-deprived teenagers are going to bed later, getting less sleep and possibly under-performing on standardized tests. We are starting to call this the teenage night owl syndrome."

In the study just published in Neuroendocrinology Letters (see abstract by clicking here) Dr. Figueiro and LRC Director Dr. Mark Rea found that eleven 8th grade students who wore special glasses to prevent short-wavelength (blue) morning light from reaching their eyes experienced a 30-minute delay in sleep onset by the end of the 5-day study.

LINK :

http://www.lrc.rpi.edu/resources/newsroom/pr_story.asp?id=182

Cube Tube Harvests Indoor Florescent Lighting For Cubicle Power

Most office complexes are as brightly lit as a desert at high noon, which results in high electric bills for owners and copious cringing for those who value energy saving practices. Come 2011, all the wasteful excess energy that positively gushes from fluorescent lighting fixtures can be harnessed and used to power devices with the aid of the CubeTube, a cylindrical photovoltaic electrical generator made by Solaroad Technologies Group, LLC.

According to Red Ferret, the CubeTube collects ambient, incandescent, and indoor florescent lighting from all directions thanks to the cylindrical shape of the device. The gathered electricity can then be used to power workstations, which plug into the base of the CubeTube. But what happens if your computer is plugged in when the Tube's energy reserves are depleted? "With a back-up internal Lithium Polymer/Ion battery and a smart charging system that monitors charging levels ... the system automatically switches back to the battery," assures Red Ferret. As another fail safe, the CubeTube will instantly switch over to the AC power grid should its internal battery go kaput; usage of the CubeTube resumes once its system has been charged.

LINKS :

http://www.earthtechling.com/2010/02/cubetube-harvests-indoor-florescent-lighting-for-cubicle-power/
http://www.solaroadtechnologies.com/cubetube.htm

Quantum Entanglement Used to Stack Light Particles

While many of us enjoyed constructing little houses out of toy bricks when we were kids, this task is much more difficult if bricks are elementary particles. It is even harder if these are particles of light – photons, which can only exist while flying at an incredible speed and vanish if they touch anything.

A team at the University of Calgary has accomplished exactly that: by manipulating a mysterious quantum property of light known as entanglement, they are able to mount up to two photons on top of one another to construct a variety of quantum states of light – that is, build two-story quantum toy houses of any style and architecture.

"This ability to prepare or control complex quantum objects is considered the holy grail of quantum science"

says Andrew MacRae, a co-author of the paper and PhD physics student at the U of C. "It brings us closer to the onset of the new era of quantum information technology."

This new generation of technology is expected to endow us with qualitatively new capabilities. This includes measurement instruments of extraordinary sensitivity, dramatically faster computers, secure communication systems and enhanced control over chemical reactions.

"Light is a particularly interesting quantum object," says paper author Alexander Lvovsky, a professor in the Department of Physics and Astronomy, "because it's an excellent communication tool. No matter what future quantum computers will be made of, they'll talk to each other using photons."

LINK :

http://www.sciencedaily.com/releases/2010/02/100214143131.htm

MEMBERSHIP APPLICATIONS APPROVED BY GOVERNING BODY

New members admitted in January, February and March 2010

M. No	Name & Addresses	Grade	Centre
I.0144	G E India Industrial P Ltd The Millienia Level - 6, Tower - B # 1 & 2 Murphy Road, Ulsoor Bangalore 600 008	Institutional	Karnataka
IM.0144	Madan P Rawal The Millienia Level - 6, Tower - B # 1 & 2, Murphy Road, Ulsoor Bangalore 600 008	Institutional Representative	Karnataka
F.0670(L)	Rajiv Gupta Precision Components & Engineers 3 B/8, Ramesh Nagar New Delhi 110 015	Fellow (Life)	Delhi
F.0671(L)	Gautam Sarkar 112, Garfa Main Road Kolkata 700 075	Fellow (Life)	Kolkata
F.0672(L)	B K A Swarup Assistant Professor Department of Electrical & Electronics Engg, SJCE Mysore 570 006	Fellow (Life)	Karnataka
F.0673(L)	B N Subba Reddy 154, K. Agrahara Bellandur Post Bangalore 560 103	Fellow (Life)	Karnataka
F.0674(L)	Sanjay Srivastava 1603 B, Hill Grange Ghodbandar Road Hiranandani Estate Thane West Mumbai 400 607	Fellow (Life)	Mumbai
F.0676(L)	Rohini Anant Bharadwaj Reliance Retail Ltd. Reliance Corporate Park Building 3A, First Floor CA09 Ghansoli, Thane Belapur Road Navi Mumbai 400 701	Fellow (Life)	Mumbai
F.0677(L)	Mehernosh Cawas Kasad 3A, Hongkong House Malcolm Baug S. V. Road Jogeshwari West Mumbai 400 102	Fellow (Life)	Mumbai
F.0678	Vinod Kumar Bansal Chief Engineer (E) Building Project Zone B-2 PWD Second Floor MSO Building (Police Head Quarters) ITO New Delhi 110 002	Fellow	Delhi
F.0679	Rajiv Chopra Philips Electronics India Ltd. 8th Floor, DLF - 9B DLF Cybercity, DLF Phase - 2 Gurgaon 122 002	Fellow	Delhi
M.1490(L)	Rajender Kumar Khatri 17 E - 118 Chopasani Housing Board Jodhpur Rajasthan 342 008	Member (Life)	Rajasthan
M.1491	Madhu Murlidharan D - 201, West View C.H.S, Sector - 2 Charkop, Kandivali West Mumbai 400 067	Member (Life)	Mumbai
M.1492(L)	K. Ganesh Canara Bank Premises & Estate Section Circle Office 7th Floor, Ansal Tower 38 Nehru Place New Delhi 110 019	Member (Life)	Delhi
M.1493(L)	Sumanta Dey 25, Satchasi, Para Road Kolkata - 700 002	Member (Life)	Kolkata
M.1494	Sanoj Kumar C/o I.D.Maneri, Plot 224, Survey No. 23/4A/6 Samarth Nagari, Srisidhi Vinayak Road Behind Transport Nagar Nigdi, Pune	Member (Life)	Mumbai
M.1495(L)	B. Jayakumar Electrical Engg. Section Indian Institute of Chemical Biology 4, Raja S.C. Mullick Road Kolkata 700 032	Member (Life)	Kolkata
M.1496	Srinath Aanegola 122 EKIP Phase - 3, Hoodi Village Whitefield Road Bangalore 560 066	Member	Karnataka
M.1498	Ramananda Tolpade Bajaj Electricals Limited 15/17, Sant Savta Marg Reay Road Mumbai 400 010	Member	Mumbai
M.1499	P. B. Tirthani Bajaj Electricals Limited 15/17, Sant Savta Marg Reay Road Mumbai 400 010	Member	Mumbai
M.1500	M. K. Pai Bajaj Electricals Limited No. 16, Bajaj Bhawan Residency Road Bangalore 560 025	Member	Mumbai

M.1502	C.V. Bangera Bajaj Electricals Limited 15/17, Sant Savta Marg Reay Road Mumbai 400 010	Member	Mumbai
M.1503	A. K. Prasad B-3/102, Lok Nisarg Ghatipada Road, Vaishali Nagar Mulund West Mumbai 400 080	Member	Mumbai
M.1504	Sunil Joseph D'Mello Bajaj Electricals Limited 15/17, Sant Savta Marg Reay Road Mumbai 400 010	Member	Mumbai
M.1505	Rajesh Balakrishnan Bajaj Electricals Limited 15/17, Sant Savta Marg Reay Road Mumbai 400 010	Member	Mumbai
M.1506	Chaitanya Shridhar Date Bajaj Electricals Limited 15/17, Sant Savta Marg Reay Road Mumbai 400 010	Member	Mumbai
M.1507	Ashish Goel Bajaj Electricals Limited 15/17, Sant Savta Marg Reay Road Mumbai 400 010	Member	Mumbai
M.1508	Kishore Vinayak Naik Bajaj Electricals Limited 15/17, Sant Savta Marg Reay Road Mumbai 400 010	Member	Mumbai
M.1509	Pradeep Kumar Tiwari B - 504, Apollo Building Hiranandani Estate Thane West Mumbai 400 607	Member	Mumbai
M.1510	Prashant Devidas Thorat Crompton Greaves Ltd. Western Region Kanjur Marg (E) Mumbai 400 042	Member	Mumbai
M.1511	Praveen Chandrashekhar Sekhar 04, Jay C.H.S, Plot No. 12 Sector - 19, Nerul (E) Navi Mumbai	Member	Mumbai
M.1512(L)	Puneet Dhawan Crompton Greaves Ltd. Lighting Division. Kanjur (E) Mumbai 400 042	Member (Life)	Mumbai
M.1513(L)	Rohit Pandit 140/A, Sanat Bose Road Kolkata 700 029	Member (Life)	Kolkata
M.1514(L)	Swaroop Bolar Crompton Greaves Ltd. Lighting Division Kanjur Marg (East) Mumbai - 400 042	Member (Life)	Mumbai
M.1515	Pratap Chand Crompton Greaves Ltd. Western Region (Lighting Division) Kanjur Marg (East) Mumbai 400 042	Member	Mumbai
M.1516(L)	Gautam Brahmbhatt ERDA Road P.B. No 760 Maharpura Vadodara 400 010	Member (Life)	Mumbai
M.1517(L)	Deepa Vijay Ramane 33, Shivprasad Society Ganeshmala, Sinhgad Road Pune 411 030	Member (Life)	Mumbai
M.1518(L)	Vijay Narayan Purandare 124, Shaniwar Peth Pune 411 030	Member (Life)	Mumbai
M.1519	Shilpa Yogesh Pant S.No.14/11/12/13A/13, B/30 Star Garden, Anand Nagar Wadgaon Budruk Sinhagad Road Pune	Member	Mumbai
M.1520(L)	Bhaskar Pai Thorn Lighting India Pvt. Ltd. 501, 5th Floor Tanishka Building Akurli Road, Kandivali East Opp. Gundecha Industrial Estate Mumbai 400 101	Member (Life)	Mumbai
M.1521	Ramesh Chand E - 6/174 East Gokul Pur Delhi 110 094	Member	Delhi
M.1522	Ajay K. R Philips Electronics India Ltd. 8th Floor, DLF - 9B DLF Cybercity DLF Phase - 2 Gurgaon 122 002	Member	Delhi
M.1523	Ajay Mehra Philips Electronics India Ltd. 8th Floor, DLF - 9B DLF Cybercity DLF Phase - 2 Gurgaon 122 002	Member	Delhi
M.1524	Rohit Dube Philips Electronics India Ltd. 8th Floor, DLF - 9B DLF Cybercity DLF Phase - 2 Gurgaon 122 002	Member	Delhi
M.1525	Nitin Sangle Philips Electronics India Ltd. 8th Floor, DLF - 9B DLF Cybercity DLF Phase - 2 Gurgaon 122 002	Member	Delhi
M.1526	Padmanava Gupta Philips Electronics India Ltd. 8th Floor, DLF - 9B DLF Cybercity DLF Phase - 2 Gurgaon 122 002	Member	Delhi
M.1527	Munish Peshin Philips Electronics India Ltd. 8th Floor, DLF - 9B DLF Cybercity DLF Phase - 2 Gurgaon 122 002	Member	Delhi
M.1528	Sanjeev Nimkar Philips Electronics India Ltd. 8th Floor, DLF - 9B DLF Cybercity DLF Phase - 2 Gurgaon 122 002	Member	Delhi

M.1529	Prashanth Karanth Philips Electronics India Ltd. 8th Floor, DLF - 9B DLF Cybercity DLF Phase - 2 Gurgaon 122 002	Member	Delhi
M.1530	Nirupam Sahay Philips Electronics India Ltd. 8th Floor, DLF - 9B DLF Cybercity DLF Phase - 2 Gurgaon 122 002	Member	Delhi
M.1531	Amitava Sengupta Philips Electronics India Ltd. 8th Floor, DLF - 9B DLF Cybercity DLF Phase - 2 Gurgaon 122 002	Member	Delhi
M.1532	P Raju Philips Electronics India Ltd. 8th Floor, DLF - 9B DLF Cybercity DLF Phase - 2 Gurgaon 122 002	Member	Delhi
M.1533	Bhagwan Shirsekhar Philips Electronics India Ltd. 8th Floor, DLF - 9B DLF Cybercity DLF Phase - 2 Gurgaon 122 002	Member	Delhi
M.1534	Ravi Narasimhan Philips Electronics India Ltd. 8th Floor, DLF - 9B DLF Cybercity DLF Phase - 2 Gurgaon 122 002	Member	Delhi
A.0996	Sucharita Dalui Begampur Hooghly West Bengal 712 306	Associate	Kolkata
A.0997(L)	Bimal Kumar Dikshit 54, Ezra Street Shop No. 54 Kolkata 700 001	Associate (Life)	Kolkata
A.0998(L)	Prakash Vasant Babar R. No. 74/3, Impressions Flat 105 Near Narayanidham Mandir Katraj Pune	Associate (Life)	Mumbai
A.0999	Srikrishna Kulkarni Bajaj Electricals Limited 15/17, Sant Savta Marg Reay Road Mumbai 400 010	Associate	Mumbai
A.1000	Ujwalla Prajapati B - 4, Chandresh Vihar Babulpada Near Air India Building Achole Road Nallasopara Mumbai	Associate	Mumbai
A.1001	Mustaqeen M S Khan Bajaj Electricals Limited 15/17, Sant Savta Marg Reay Road Mumbai 400 010	Associate	Mumbai
A.1002	S. K. Alauddin Ali Bajaj Electricals Limited 15/17, Sant Savta Marg Reay Road Mumbai 400 010	Associate	Mumbai
A.1003	Susnata Bhowmick Lab. Lighting Division Crompton Greaves Ltd. Kanjur Marg East Mumbai 400 042	Associate	Mumbai
A.1004	Sumant Kumar Mukherjee Lighting Division, Design Dept. Crompton Greaves Ltd. Kanjur Marg East Mumbai 400 042	Associate	Mumbai
A.1005	Sandesh Suresh Ambre Crompton Greaves Ltd. Kanjur Marg East Mumbai 400 042	Associate	Mumbai
A.1006	Saikiran Peddigari Lighting Division Crompton Greaves Ltd. Kanjur Marg East Mumbai 400 042	Associate	Mumbai
A.1007	Subhankar Pramanick Lighting Division Crompton Greaves Ltd. Kanjur Marg East Mumbai 400 042	Associate	Mumbai
A.1008	Kapil Kumar Lighting Division, Design Dept. Crompton Greaves Ltd. Kanjur Marg East Mumbai 400 042	Associate	Mumbai
A.1009	Ramesh Unhavane Lighting Division, Design Dept. Crompton Greaves Ltd. Kanjur Marg East Mumbai 400 042	Associate	Mumbai
A.1010	Alpeshkumar Gokulbhai Patel A/32 Anjana Society Nr. India Colony Thakkar Bapanagar Road Bapunagar Ahmedabad	Associate	Mumbai
A.1011(L)	Shiva Rai 2000 Walnut Avenue Appt. # B 101 Fremont CA 94538 USA	Associate (Life)	Overseas
A.1012(L)	Jitendra Baid Ajanta Trading Company 18, Ezra Street Kolkata 700 001	Associate (Life)	Kolkata
A.1013	Naveen Malik 30, MIG Flats Punjabi Bagh Enclave Madipur Opp. Arihant Nagar Delhi 110 026	Associate	Delhi
A.1014	Sudhansu Gupta Akshay Green Energy 30, Punjabi Bagh Enclave Madipur Punjabi Bagh (W) Delhi 110 026	Associate	Delhi
A.1015	T. A. Hrishikesh Lighting Division Crompton Greaves Ltd. Kanjur Marg East Mumbai 400 042	Associate	Mumbai
A.1016	Rahul Ranjan Rakvi Crompton Greaves Ltd. Kanjur Marg East Mumbai 400 042	Associate	Mumbai

A.1017	Mohit Saraswat D - 414, Sector - D L.D.A. Colony Kanpur Road Lucknow 226 012	Associate	Delhi
A.1018	Sushil Jain F - 305 B Pandav Nagar Delhi 110 091	Associate	Delhi
A.1019	Sumit Tyagi C - 518, First Floor Vikas Puri New Delhi 110 018	Associate	Delhi
A.1020	Rakesh Kumar Mishra A - 274, First Floor Defence Colony New Delhi 110 024	Associate	Delhi
A.1021	Sachin Khera Philips Electronics India Ltd. 8th Floor, DLF - 9B DLF Cybercity DLF Phase - 2 Gurgaon 122 002	Associate	Delhi
A.1022	Swagata Chakrabarti Philips Electronics India Ltd. 8th Floor, DLF - 9B DLF Cybercity DLF Phase - 2 Gurgaon 122 002	Associate	Delhi
A.1023	Anirban Kundu Philips Electronics India Ltd. 8th Floor, DLF - 9B DLF Cybercity DLF Phase - 2 Gurgaon 122 002	Associate	Delhi
A.1024	Siddharth Singh Philips Electronics India Ltd. 8th Floor, DLF - 9B DLF Cybercity DLF Phase - 2 Gurgaon 122 002	Associate	Delhi
A.1025	Gaurav Chopra Philips Electronics India Ltd. 8th Floor, DLF - 9B DLF Cybercity DLF Phase - 2 Gurgaon 122 002	Associate	Delhi
A.1026	Subhadeep Maitra Philips Electronics India Ltd. 8th Floor, DLF - 9B DLF Cybercity DLF Phase - 2 Gurgaon 122 002	Associate	Delhi
A.1027	Vikas Rana Philips Electronics India Ltd. 8th Floor, DLF - 9B DLF Cybercity DLF Phase - 2 Gurgaon 122 002		Delhi
A.1028	Arup Ratan Chakraborty Philips Electronics India Ltd. 8th Floor, DLF - 9B DLF Cybercity DLF Phase - 2 Gurgaon 122 002	Associate	Delhi
A.1029	Deepak Tiwari Philips Electronics India Ltd. 8th Floor, DLF - 9B DLF Cybercity DLF Phase - 2 Gurgaon 122 002	Associate	Delhi
A.1030	Rishi Agnihotri Philips Electronics India Ltd. 8th Floor, DLF - 9B DLF Cybercity DLF Phase - 2 Gurgaon 122 002	Associate	Delhi
A.1031	Nikita Punn Philips Electronics India Ltd. 8th Floor, DLF - 9B DLF Cybercity DLF Phase - 2 Gurgaon 122 002	Associate	Delhi
A.1032	Sumit Kar Philips Electronics India Ltd. 8th Floor, DLF - 9B DLF Cybercity DLF Phase - 2 Gurgaon 122 002	Associate	Delhi
A.1033	Akshay Bala Chandra Philips Electronics India Ltd. 8th Floor, DLF - 9B DLF Cybercity DLF Phase - 2 Gurgaon 122 002	Associate	Delhi
A.1034	Vivek Jain Philips Electronics India Ltd. 8th Floor, DLF - 9B DLF Cybercity DLF Phase - 2 Gurgaon 122 002	Associate	Delhi
S.0363	Pranshu K Mishra Ft. No. 14, Kanijnath Building Near MIT College Pune	Student	Mumbai
S.0364	Sandeep Kumar Riyar Anand Nagar Colony Saipau Road Dholpur Rajasthan	Student	Mumbai
S.0365	Saquib Hassan B/23, Kanchan Jyoti Society Madhav Baug, Kothrud Pune 411 038	Student	Mumbai
S.0366	Kaushal Kumar Prem Kunj Bhaban, Pan Nawada Near Old Electric Office Chabni Nawada Bihar	Student	Mumbai
S.0367	Ashish Gunwantrao Nikhare Quarter No. E-217/3 CTPS Colony, Urjanagar Chandrapur 442 409	Student	Mumbai
S.0368	Amreek Sarawat B -22, Suvarna Park Bavdhan Pune	Student	Mumbai
S.0369	Preeti Narhari Karemore Plot No 1202, Behind MIG Colony KDK College Road Nandanwan Nagpur 440 009	Student	Mumbai
S.0370	Bhupender Kumar Flat No - 9, Om Sai Complex Bawdhan Khurd Pune		Mumbai

Transfer of grade

M.1497	Ashwin Panchal Bajaj Electricals Limited 15/17, Sant Savta Marg Reay Road Mumbai 400 010	Member from A.0378	Mumbai
M.1501	S. N. Jagdale Bajaj Electricals Limited 15/17, Sant Savta Marg Reay Road Mumbai 400 010	Member from A.0455	Mumbai

The Biggest Light Fair in India

Lii 2011
LIGHT INDIA INTERNATIONAL
4-7 March 2011
Chennai Trade Centre, Chennai, India

Title Sponsor
indiamart.com
Source > Supply > Grow

APPROVED BY
ITPO

ACADEMIC PARTNER
MIT SCHOOL OF LIGHTING & MANAGEMENT STUDIES
MITSOL

MEDIA PARTNER
Sourcing ELECTRICALS&LIGHTING

SUPPORTED BY

FOR FURTHER DETILS CONTACT

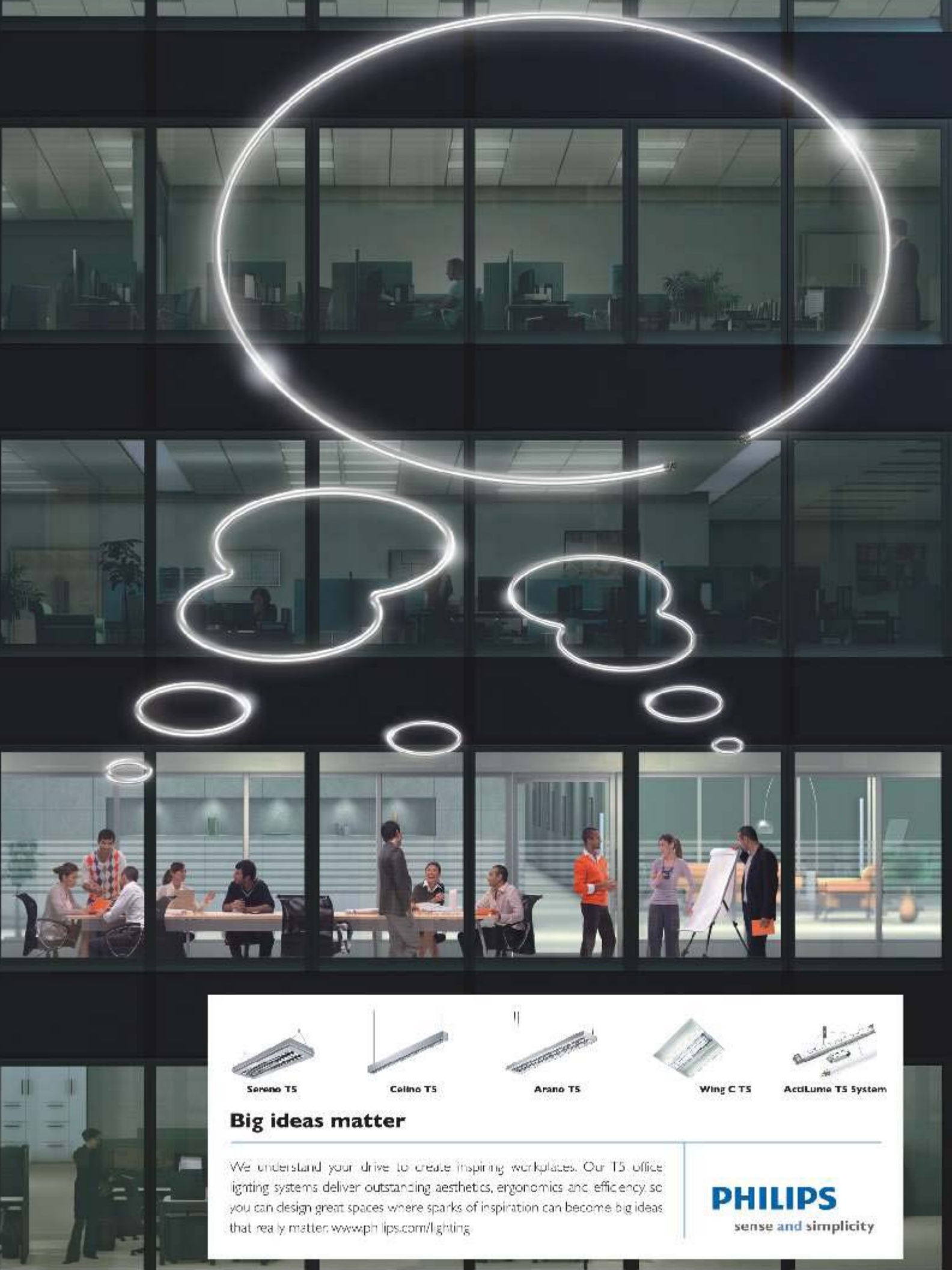
Mr. R. Balasubramanian, Hony. Secretary - ISLE Chennai State Centre (Mobile: +91-9840055645) E-mail: balu@Lii2011.in
Mr. S. Raghavan, Advisor - ISLE (Mobile: +91-9790974048) E-mail: sraghavan@Lii2011.in

Lii 2011
LIGHT INDIA INTERNATIONAL

4-7 March 2011
Chennai Trade Centre, Chennai, India
E-mail : info@Lii2011.in Website : www.Lii2011.in

Organised by
isle
Indian society of lighting engineers

Chennai State Centre
D-10, Ambattur Industrial Estate, Chennai - 600058, India
Tel : +-91-44-26257710, 42281950. Fax : 26257866, 26243500
E-mail : islechennai@Lii2011.in



Sereno T5

Celino T5

Arano T5

Wing C T5

AccuLuma T5 System

Big ideas matter

We understand your drive to create inspiring workplaces. Our T5 office lighting systems deliver outstanding aesthetics, ergonomics and efficiency so you can design great spaces where sparks of inspiration can become big ideas that really matter. www.philips.com/lighting

PHILIPS

sense and simplicity