Policy Initiatives by India to Promote Energy Efficient Lighting

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Bureau of Energy Efficiency

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Standard and Labeling Program

Energy Efficient Street Lights

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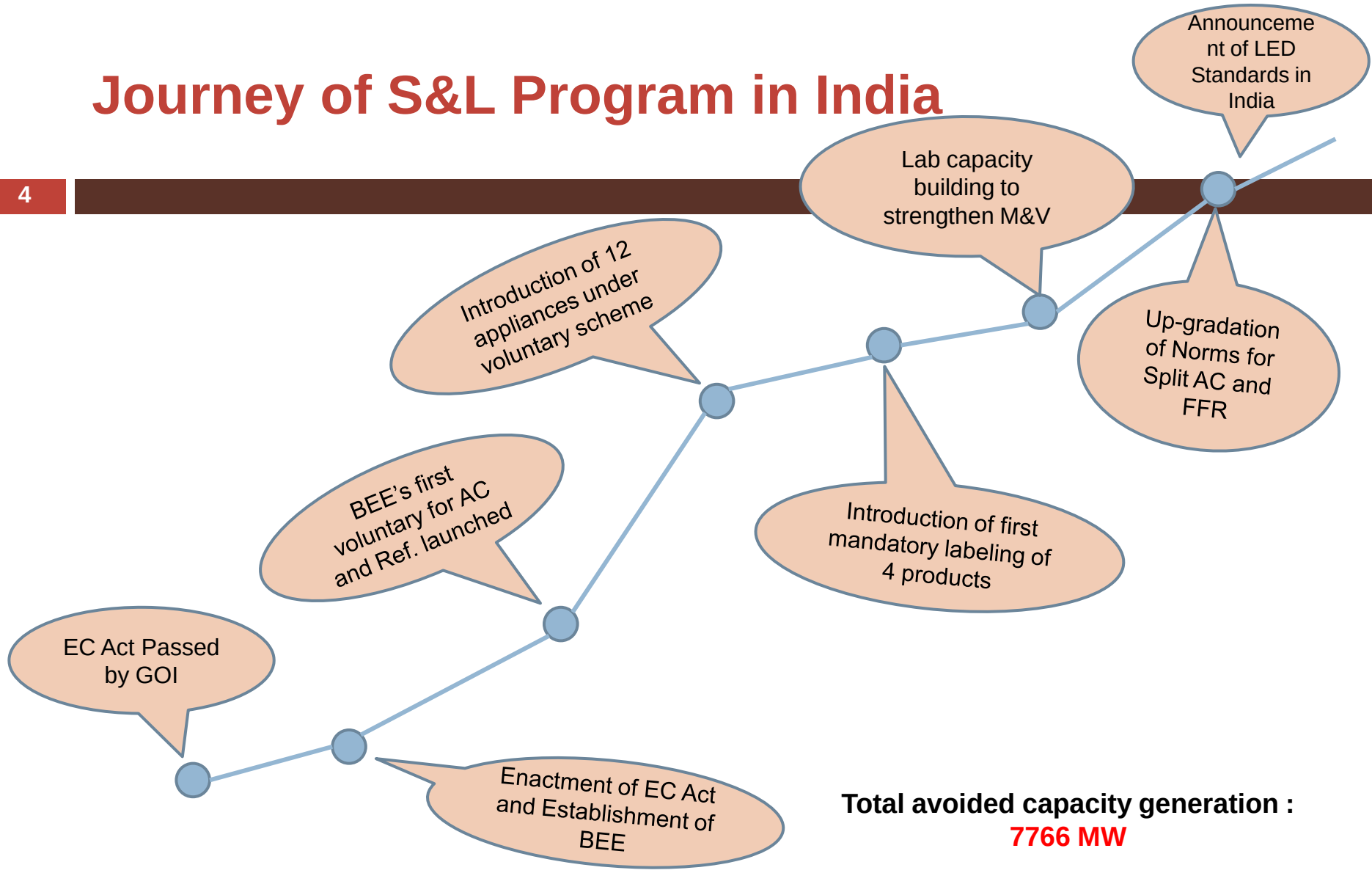
Standards & Labeling Programme

- To create appropriate legal and regulatory environment for energy efficient end use products
- To provide the consumer an informed choice about energy saving by using efficient devices
- Mandatory labeling for ACs, Refrigerators, Tubelights (TL), and Distribution Transformers already in place
- Consumer awareness campaign launched
- Independent institutional mechanism for check and challenge testing on random basis for labeled equipments being conducted.
- **The National Energy Labeling Programme Launched by Hon'ble Union Minister of Power on 18th May, 2006**

Journey of S&L Program in India

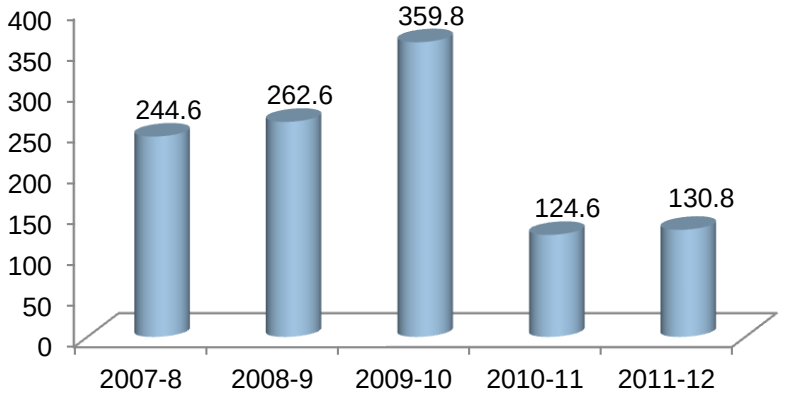


Total avoided capacity generation :
7766 MW

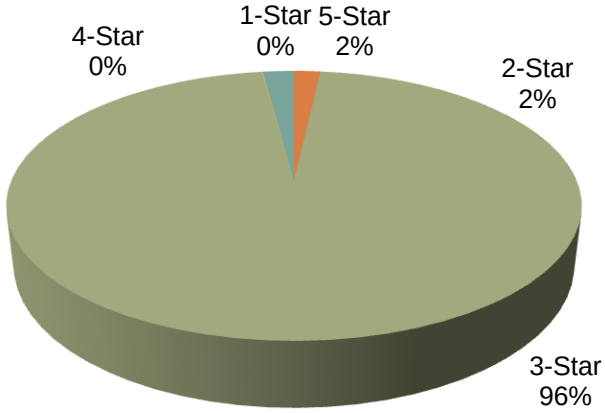
S&L Program in TFLs

- Launched in the year 2006
- Became mandatory in Jan 2010
- 46 models have been approved for star rating
- Total No. of star rated products manufactured : 1122 millions
- Avoided Generation Capacity: 470 MW (i.e. 6.1% of total)

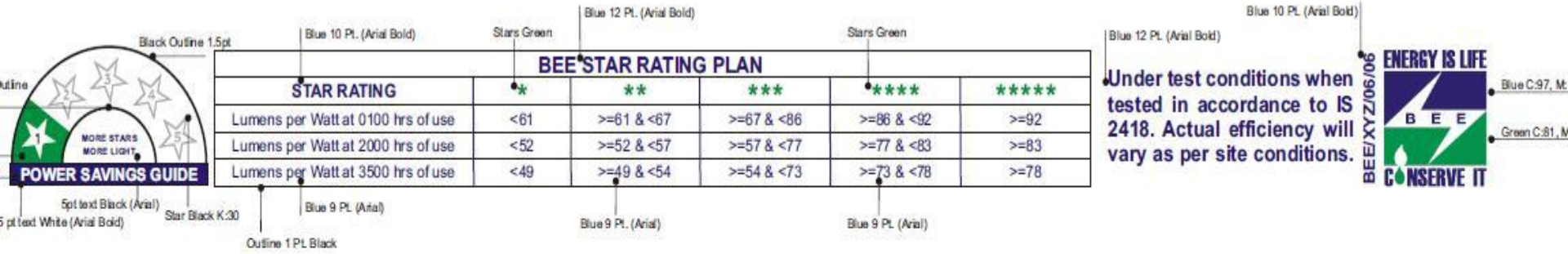
No. of Star Rated Products (in Millions)



Share of Star Rated Products of TFLs



S&L Program in TFLs



BEE STAR RATING PLAN

STAR RATING	*	**	***	****	*****
Lumens per Watt at 0100 hrs of use	<61	>=61 & <67	>=67 & <86	>=86 & <92	>=92
Lumens per Watt at 2000 hrs of use	<52	>=52 & <57	>=57 & <77	>=77 & <83	>=83
Lumens per Watt at 3500 hrs of use	<49	>=49 & <54	>=54 & <73	>=73 & <78	>=78

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Under test conditions when tested in accordance to IS 2418. Actual efficiency will vary as per site conditions.

BEE/XYZ/06/06 ENERGY IS LIFE B E E CONSERVE IT

Bachat Lamp Yojana (BLY)

CDM based Scheme for promoting CFLs

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Bachat Lamp Yojana (BLY)

- Bachat Lamp Yojana is a scheme developed by BEE to promote energy efficient lighting in domestic sector in India.
- BLY was registered as Small-Scale CDM Programme of Activities (SSC-PoA) in the UNFCCC- Executive Board on 29th April 2010.
- Quality long-life CFLs would be distributed by CPA implementer(s) to grid-connected residential households in co-ordination with DISCOMs in exchange of an incandescent lamp (ICL) and 15 INR.
- Under each CPA approximately 6 ,00 000 CFLs to be distributed ~ 60 GWh.
- The implementer(s) would cover the project cost through sale of GHG emission reductions achieved in their respective Project areas.

Bachat Lamp Yojana (BLY) : 11th Plan Period

- BLY was registered with UNFCCC as the CDM-PoA on 29th April, 2010
- National level stakeholder consultation workshops were organised to provide the platform for the scheme related discussions
- Several state level workshops were organised to facilitate the penetration of the scheme throughout the country
- 19 states have already initiated BLY and are at various stages of project preparation
- 50 CPAs (BLY projects) have been included to the PoA

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Bachat Lamp Yojana (BLY) : 11th Plan Period

- 259 lakh CFLs have been distributed under the scheme
- 324 MW of avoided generation capacity verified
- Templates for submission of the BLY projects to BEE standardised
- Standardised Legal agreements
- Documents management system as per ISO 9001
- On line database management system being developed

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Demonstration of EE Lighting System: A Case Study in Public Utility

Energy Efficient Street Lights

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Demonstration Projects: Objectives

- To showcase the effectiveness of the most energy efficient device / technology through a practical demonstration
- To facilitate the State Governments in replicating these demonstration projects through various Departments / Agencies.
- 67 demonstration project on street lighting, drinking water pumping system & SMEs clusters identified by 29 SDAs
- Demo project on energy efficient street lighting implemented at Dimapur (Nagaland), Dibrugarh (Assam), Gandhinagar (Gujarat) and Bangalore (Karnataka)

Present Scenario

- Busy & Important road segment of 1.1 km in South India
- 36 x 250 watt HPSV lights supplied from 3 supply feeders
- RCC Pole height = 9.5 m
- Pole to Pole distance is irregular varying from 22m to 39 m
- Timers are installed
- The road is having central verge

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Baseline Power Consumption per Lamp

Location	Remark	Volt	Amp	PF	KW	Power Cons./Lamp (Watt)
Keltron S/S	13 numbers of 250W HPSV lamps were ON	236	34.8	0.42	3.45	265
Single Fitting	GE Make measured at KSEB	223	2.98	0.39	0.26	259
Pole -10	5 numbers of 250W HPSV lamps were ON	226	13.6	0.41	1.26	252
Average (Obtained from above)		**228.3**		**0.41**		**258.8**

Avg. Power = 259 w per lamp

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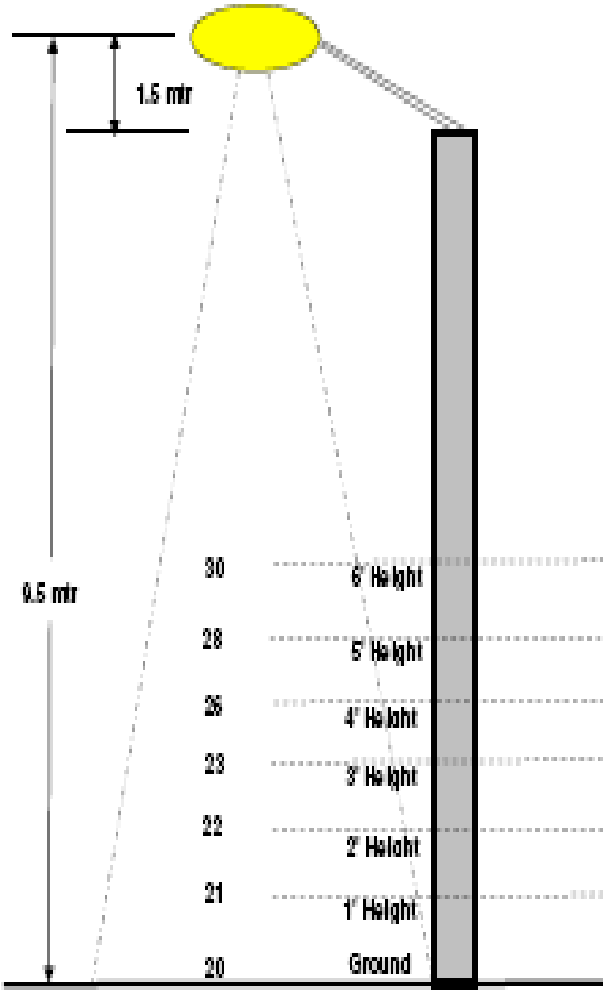
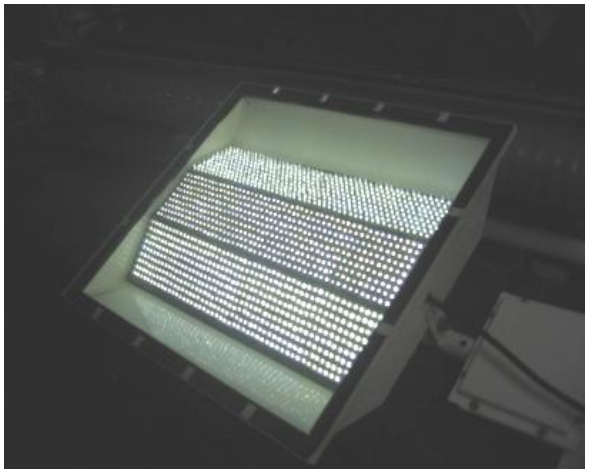
Lux Measurement

Locations	Lux (Avg.) in Road Positions	
Along the Pole	*Pole side Half*	*Other Half*
Under Light Fittings	19 - 20.5	-
Middle of the road	16.5 - 19.5	6 - 8
Edge of the Middle Verge	13 - 14.5	9 - 13.5
Edge of the road	-	4 - 4.5
Between Two Poles	*Pole side Half*	*Other Half*
Between Poles	5.3 - 9.3	-
Middle of the road	5 - 7	3 - 4
Edge of the Middle Verge	4.7 - 5.3	4 - 5.3
Edge of the road	-	1.7 - 3



Demonstration : LED Street Light

- Power Consumption : 100 Watt
- Supply Voltage : 180-250 V AC
- LED Type : 5 mm
- Electrical Connection: Lead wire 1m long
- LED Cluster : 1400
- Dimensions (mm) : 750x230x125
- Dispersion angle : 60 degree



Measurement of Electrical Parameters

LED Lamp Power Measurements

Voltage (Max)	Volt	227.5	
Voltage (Min)	Volt	221.3	
Voltage (Avg.)	Volt	225	
Supply Frequency	HZ	48.8	
Current	Amp	0.80	
Power Factor		0.46	(Leading)
Power Consumption	Watt	98.11	
Total Harmonic Distortion(THD)	%	13	

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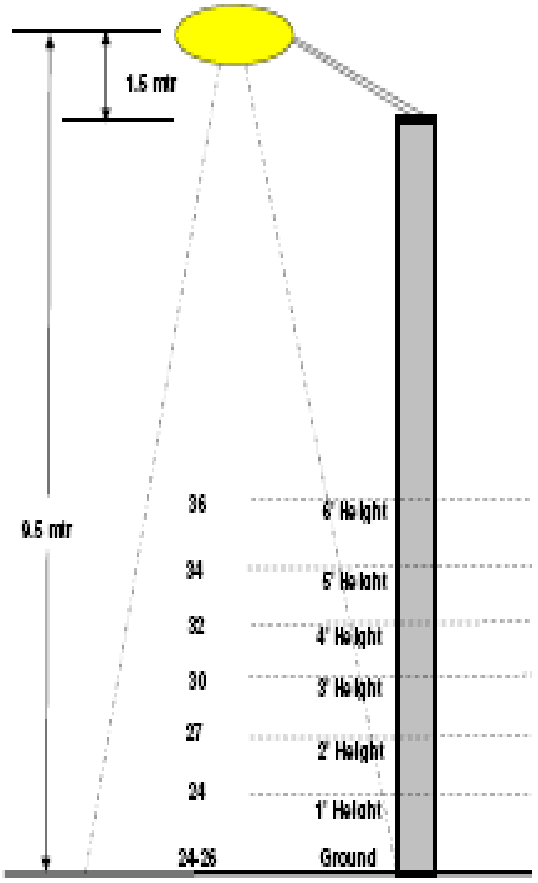
Lux Level Measurement

Locations	Lux (Avg.) in Road Positions	
Along the Pole	*Pole side Half*	*Other Half*
Under Light Fittings	26	-
Middle of the road	22	-
Edge of the Middle Verge	15	14
Edge of the road	-	-



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LED Demonstration Project

(Successful implementation of demo project on LED lights at Nagaland)

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LED Village Campaign

Showcasing Energy Efficient Lighting System

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LED Village Campaign

a) BEE is launching a nationwide LED VILLAGE CAMPAIGN

b) BEE proposes to convert the existing incandescent bulbs (ILB) in the households and the street lights of one village with LEDs.

c) The objective is to showcase the new technology for lighting using LED so that a comparison can be demonstrated between LED and ILBs and facilitate the State Governments in replicating these demonstration projects

d) A maximum support to the tune of Rs. 15.00 lakhs is being provided by BEE

e) A village consisting of around 200 – 250 households can be converted into a LED village within the estimated expenditure.

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(LED Street lights fitted in Makumpathar No. 4 village, Assam)

LED Standards in India

Quality Control Initiatives

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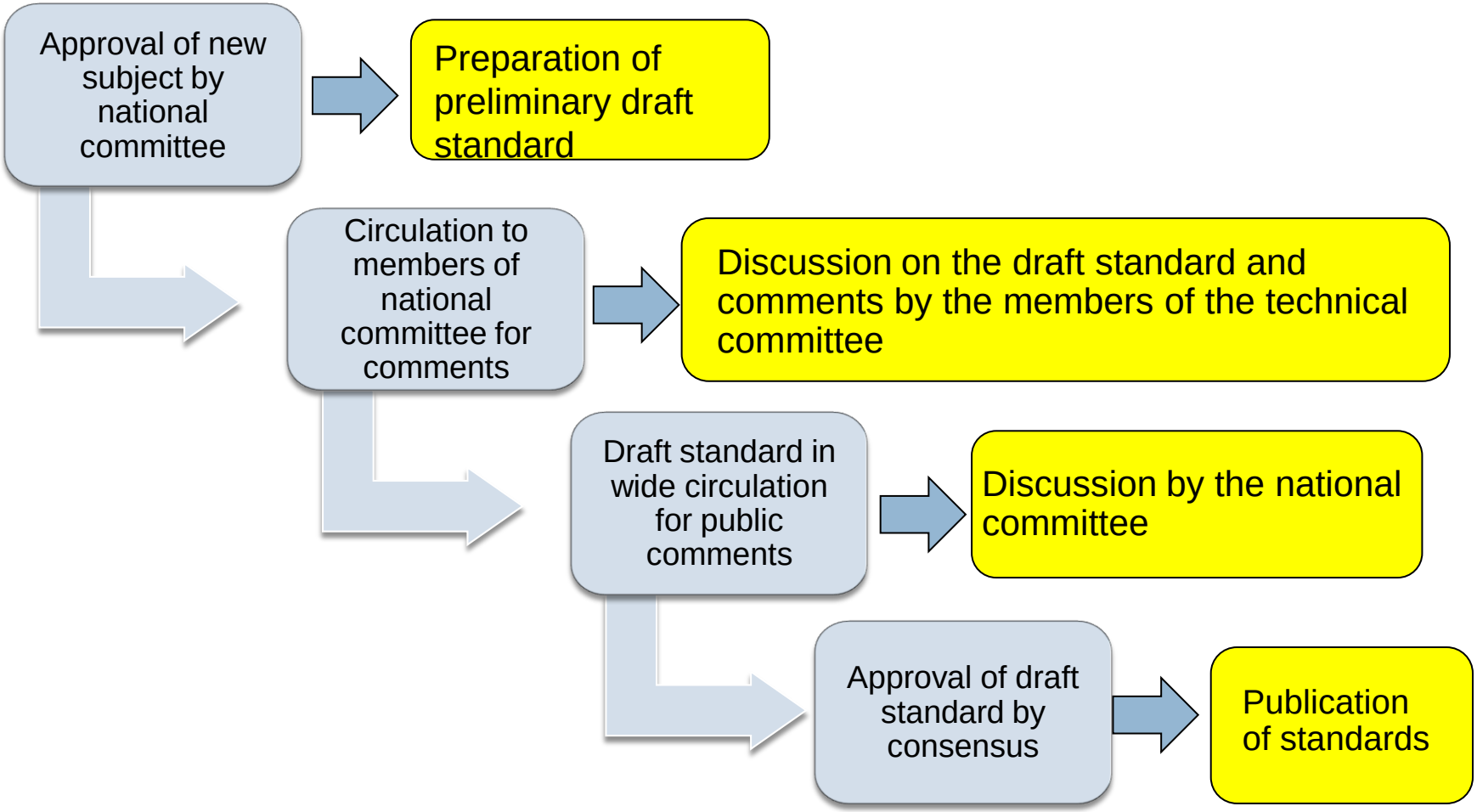
LED Standards in India



National Standardization Process

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Indian Standards on LED

- Terms and definitions for LEDs and LED modules in general lighting (IEC 62504)
- Self Ballasted LED-Lamps for General Lighting Services, Part 1 Safety Requirements (IEC 62560)
- Self Ballasted LED-Lamps for General Lighting Services Part 2 Performance Requirements (IEC 62612)
- LED Modules for General Lighting- Part 1, Safety Requirements (IEC 62031)
- LED Modules for General Lighting -Part 2,Performance Requirements (IEC 62717)

Indian Standards on LED

- Lamp Control gear-Part 2 Particular Requirements, Section 13, DC or AC Supplied Electronic Control-gear for LED Modules (IEC 61347-2-13)
- DC or AC Electronic Control Gear for LED Modules - Performance Requirements (IEC 62384)
- Method of Measurement of Lumen Maintenance of Solid State Light (LED) Sources (IES-LM-80-08)
- Method Of Electrical and Photometric Measurements of Solid- State Lighting (LED) (IES-LM-79-08)
- LED Luminaries for General Lighting purposes- Performance Requirements (IEC/PAS 62722-2-1)

Super-Efficient Appliance Deployment (SEAD)

Global Participation under CEM

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SEAD – Efficient Lighting Collaboration

- SEAD is a global market transformation initiative for deploying super-efficient equipment and appliances.
- India is chairing a new efficient lighting collaboration under SEAD
- The efficient lighting collaboration aims to encourage governments for shifting towards more efficient lighting technologies, such as:
  - Compact fluorescent lamps
  - Solid state lighting

SEAD - Street Lighting Toolkit

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Thanks…..

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