



Regulated Multi-State DSM Programme (RMSDP) to Stimulate LED Lighting in India

Presentation by

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Energy Efficiency Potential and Outcome



Energy Conservation potential assessed as at present (IEP) (15% by DSM)	-	20000MW
Verified Energy Savings :		
-During X Plan period	-	877 * MW
-During 2007-08, 2008-09 and H1 2009-10		3477 MW
-Target for 2009-10		2600 MW
-Target for XI Plan period (5% reduction of energy consumption)	-	10000 MW

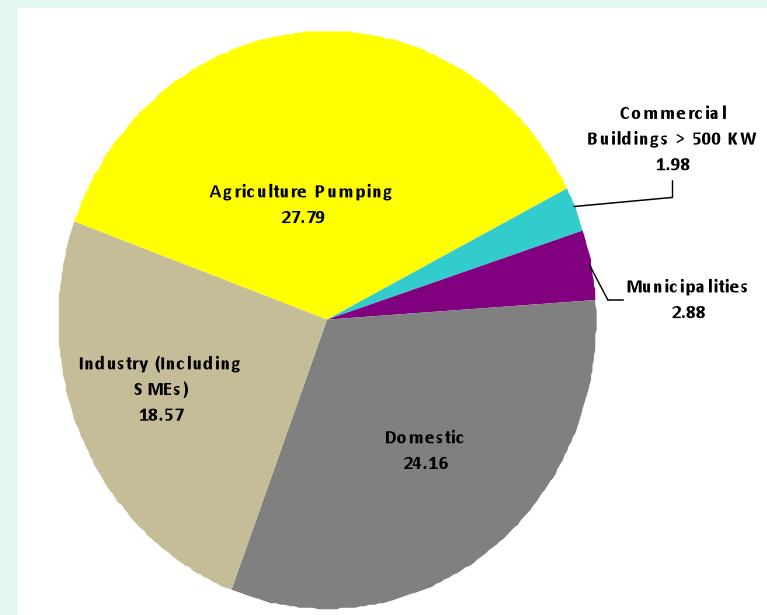
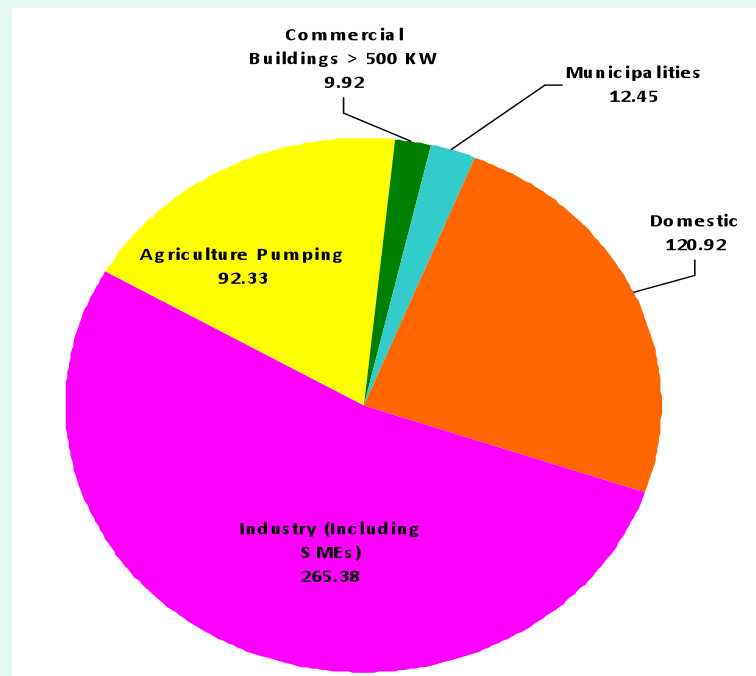
** Only as indicated by participating units in the National Energy Conservation award scheme, for the previous five years.*



Electrical Energy Consumption and Conservation Potential



S. No.	Sector	Consumption	Saving Potential	% Savings
1.	Agriculture Pumping	92.33	27.79	30.09
2.	Commercial Buildings/ Establishments with connected load > 500 KW	9.92	1.98	19.95
3.	Municipalities	12.45	2.88	23.13
4.	Domestic	120.92	24.16	19.98
5.	Industry (Including SMEs)	265.38	18.57	6.99
	Total	501.00	75.36	15.04



Source: BEE/ NPC Study 2009



Energy Efficiency - Action Plan



- **Bachat Lamp Yojana** to promote energy efficient and high quality CFLs as replacement for incandescent bulbs in households.
- **Standards & Labeling Scheme** targets high energy end use equipment and appliances to lay down minimum energy performance standards.
- **Energy Conservation Building Code (ECBC)** sets minimum energy performance standards for new commercial buildings.
- **Agricultural and Municipal DSM** targeting replacement of inefficient pumpsets, street lighting, etc.
- **Operationalising EC Act by Strengthening Institutional Capacity of State Designated Agencies (SDAs)** : The scheme seeks to build institutional capacity of the newly created SDAs to perform their regulatory, enforcement and facilitative functions in the respective States.
- **Energy Efficiency Improvement in Small and Medium Enterprises (SMEs)**: To stimulate energy efficiency measures in 25 high energy consuming small and medium enterprise clusters.



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NMEEE-4 New Initiatives



- A market based mechanism to enhance cost effectiveness of improvements in energy efficiency in energy-intensive large industries and facilities, through certification of energy savings that could be traded. (**Perform Achieve and Trade**)
- Accelerating the shift to energy efficient appliances in designated sectors through innovative measures to make the products more affordable. (**Market Transformation for Energy Efficiency**) – **RMSDP** being structured under this initiative to promote super efficient appliances like LEDs
- Creation of mechanisms that would help finance demand side management programmes in all sectors by capturing future energy savings. (**Energy Efficiency Financing Platform (EEFP)**)
- Developing fiscal instruments to promote energy efficiency namely **Framework for Energy Efficient Economic Development (FEEED)**



Key Policy Objectives for Promoting LEDs



- Primary energy supply to increase 4-5 times by 2030 to provide for high economic growth and energy access to all
- Energy efficiency is essential to serve the twin purpose of sustainable development (in the context of climate change concerns) and energy security – need to promote in all sectors
- LED as a lighting source provides an opportunity to attempt technology leapfrogging in lighting – potential reduction in peak demand
- Enhanced demand of LEDs could result in reduction of costs



LEDs- Life Cycle Costs Comparisons



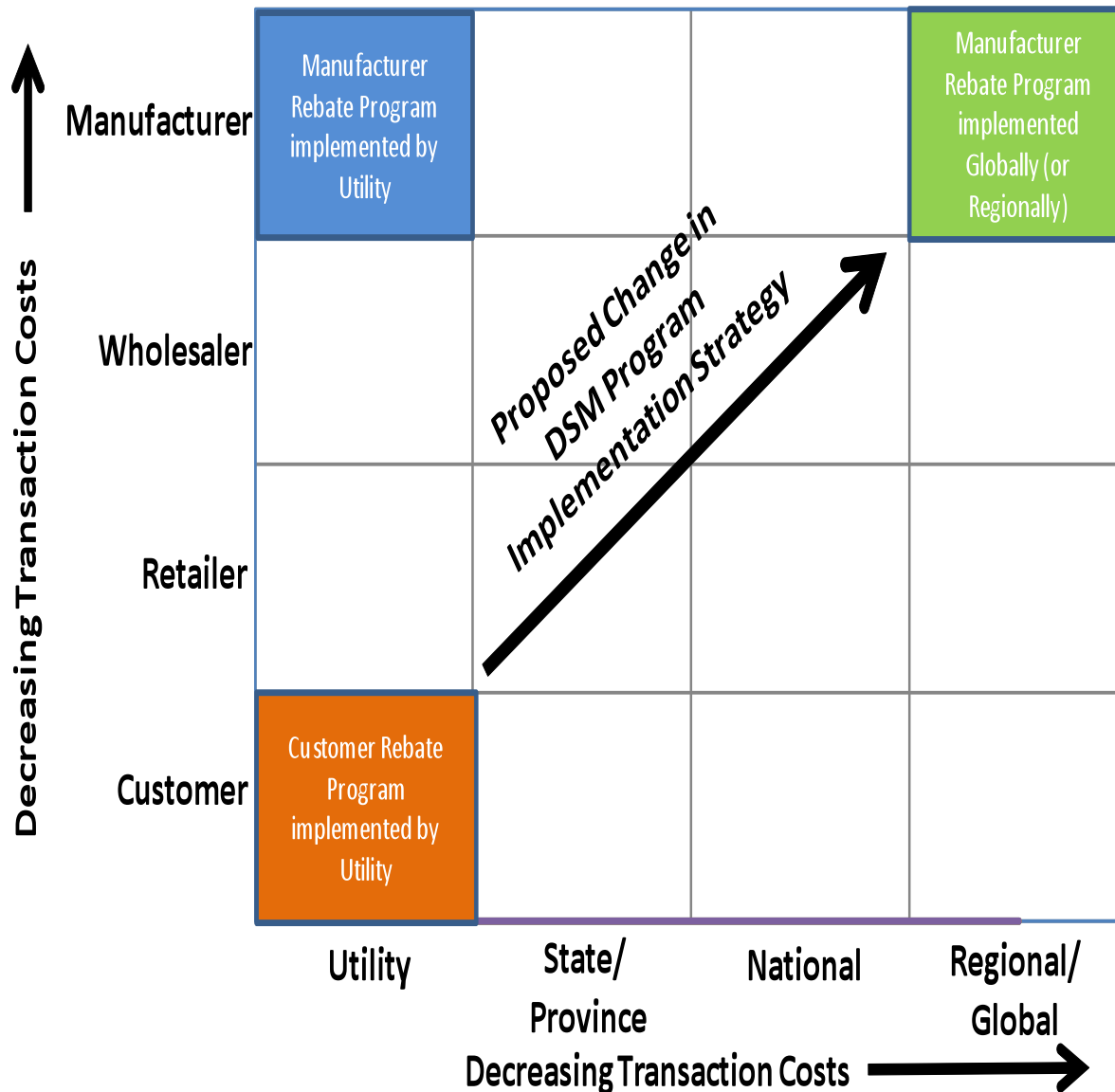
Device	Avg Lm / Watt	Watt to match Lm/ W	Rated life (hrs)	Energy Use over device life (kWhr)	Initial Cost (Rs)	Life Cycle Energy Use Cost (Rs)	No of Lighting Devices to Match LED Life	Overall Life Cycle Cost to match LED life INR	Payback w.r.t ICL
ICL	10	60.0	1000	60.0	15	239.8	50	12742	-
CFL	60	12-14	6000	62.0	125	248.0	8	3108	1.2 years
LED	70	9	50000	442.9	1000	1771.4	1	2771	2.16 years

Advantages of LEDs

- Directional Lighting:
- Durability: last for 50,000 hours or more
- Cool operation
- Produce all manner of different pure light colors
- Compactness: are lightweight, discreet and robust.



Regulated Multi-State DSM Programme (MSDP)



Transaction costs reduces by:

- (1) Enlarging geographical scope of the program, moving from utility to state, national and then global programs; and the
- (2) Product chain stakeholders starting from the customer and moving upstream to retailer, wholesaler and finally the manufacturer.

MSDP could aggregate of LED demand significantly



Financing Multi-State DSM Programmes



Following three major financing sources are usually available to distribution utilities:

- *Self financing or Recovery of Costs through Annual Revenue Requirement*
- *Recovery of costs associated with DSM in Utility ARR*
- *Development of Special Fund*
- *By way of levy of cess on certain consumers, penal; charges, etc (MERC Case)*
- *Grants from Government/ International Agencies*

For the MSDP to promote LEDs, a combination of Special Fund and Grants is suggested as the core financing with the regulatory mechanism allowing for implementation of DSM programmes in the respective utilities.



Economic Model- LED Promotion under MSDP



Assumptions:

- 40,000 ICLs to be replaced LED lighting in a circle
- 60W ICL replaced by 9 W- LED device Cost of Rs. 1000.
- Operating hours per day are taken as 2000 in a year; peak hours are 1000
- Savings at peak hours Rs. 6 /kWh estimated

**Total investment/ circle-
Rs. 4 crores**

**Savings in electricity – 2.2
KWh/ year**

**Savings in money terms –
Rs. 1.32 crores/ year**



National Manufacturing Competitiveness Council (NMCC) Initiative

- NMCC set up an Inter-Ministerial Core Committee chaired by Sh. Gireesh B Pradhan, Additional Secretary, MOP – MNRE, Dept. of Information Technology and BEE were other members
- Extensive consultations done with various stakeholders
- Report submitted to NMCC
- **Buy-in of all state governments, utilities and Regulatory Commissions**
- Coordination of other incentives to enable setting up of manufacturing facilities



Core Committee Report- Barriers to LED



- (a) Limited availability of LED technology in India;
- (b) High initial cost of LEDs that makes the pay-back period very long (> 7 years); the proposition is the same even after factoring carbon finance associated with the low energy consumption of LEDs;
- (c) Absence of national technical standards for LEDs, which apart from constraining its penetration, lends itself to import of sub-standard LED devices.
- (d) Lack of testing protocols, facilities and accredited laboratories at the national level
- (e) No incentives, either in terms of demand or other fiscal measures to attract major LED manufacturers to set up manufacturing facilities in India, as is the case with China.



Core Committee Report- Recommendations



- (i) A Central Institutional Mechanism (CIM) be constituted under the Chairmanship of Secretary, Ministry of Power with representatives from the Ministry of Urban Development (MoUD), Department of Information Technology (DIT), Ministry of New and Renewable Energy (MNRE), Department of Industrial Policy and Promotion (DIPP), Forum of Regulators (FOR), Bureau of Indian Standards (BIS), Bureau of Energy Efficiency (BEE) and Energy Efficiency Services Ltd. (EESL).
- (ii) Aggregation of future LED demand under regulatory oversight is the appropriate way to significantly enhance volumes and therefore attract leading manufacturers to India and have the co-benefit of reduced cost. The CFL success story, where policy interventions from Ministry of Power and BEE, made it possible to not only increase sales from around 20 million in 2003-04 to around 250 million in 2009-10 but also reduced costs by almost 50%, needs to be replicated, but in an accelerated manner;
- (iii) Mandating phased domestic manufacturing for such demands must be integrated in the policy framework;
- (iv) Appropriate fiscal incentives need to be structured by the Government to promote LEDs in India. This could be in form of tax/duty incentives, tariff incentives or measures to promote domestic manufacturing etc.



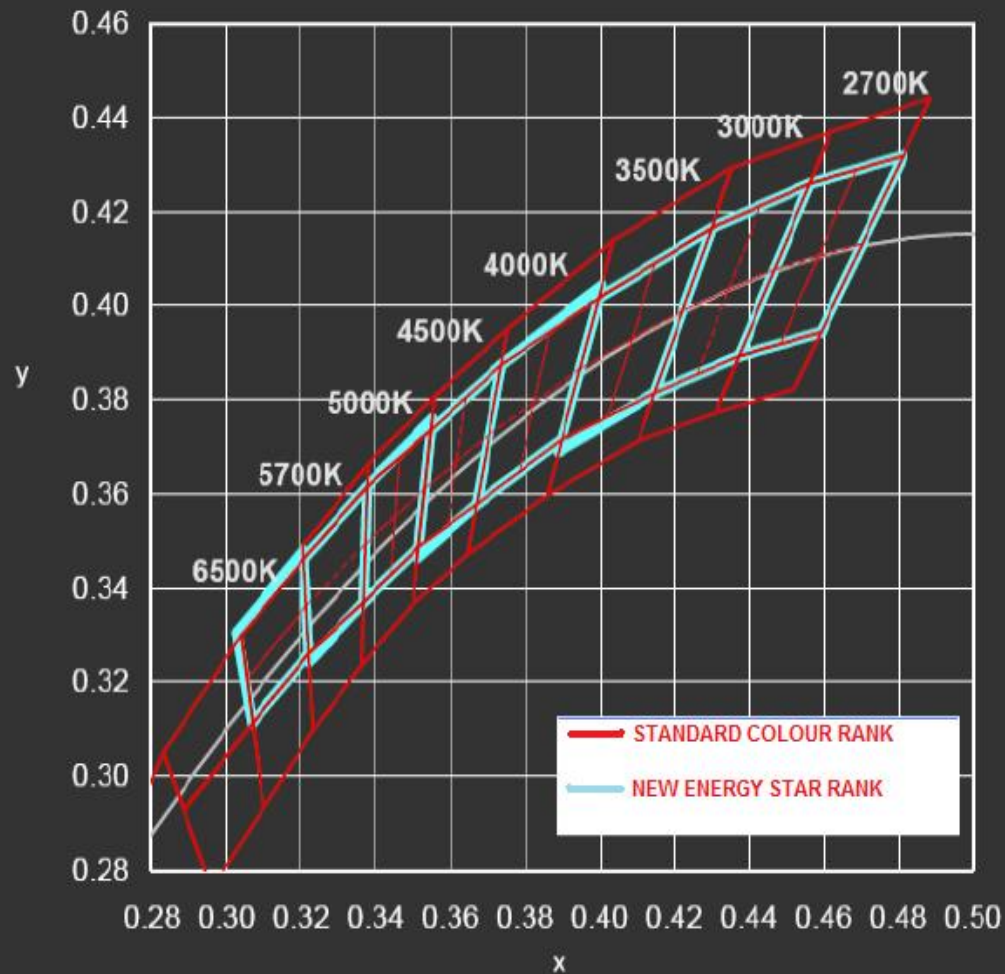
Core Committee Report- Recommendations (2)



- (v) Initial focus on only high use commercial applications under the MSDP , such as institutional (hotel, hospital etc) and Public space lighting (Streets, Stadiums etc). provision of one LED light each under Rajiv Gandhi Gramin Vidyutikaran Yojana (RGGVY) for each one of 50 lakhs BPL households.
- (vi) The scheme announced by Ministry of Power of providing electricity to all villages within a 5 km radius of all central power generating stations with the necessary infrastructure for distribution of electricity to be provided by the CPSU concerned, has been amended to provide for at least one LED lamp to each household. The scheme was formally launched on 28th April, 2010 by Hon'ble Minister of Power.
- (vii) Central and state procurement agencies including CPWD to be motivated/ convinced to take part in this programme, the aggregated demand would probably be one of the biggest global tenders. It is expected that enough interest could be generated internationally to attract some of the biggest players.
- (viii) Setting up of a neutral, trusted, testing facility in the government sector needs to be initiated in this current financial year itself. The Group recommends that the Government must identify an appropriate institution and provide grant estimated to be Rs. 25-50 crores for this purpose.



Technical Specifications



- **Converging the specifications with Energy star.**

- **Define Minimum Benchmarks**

- **Define Protocols for Testing.**

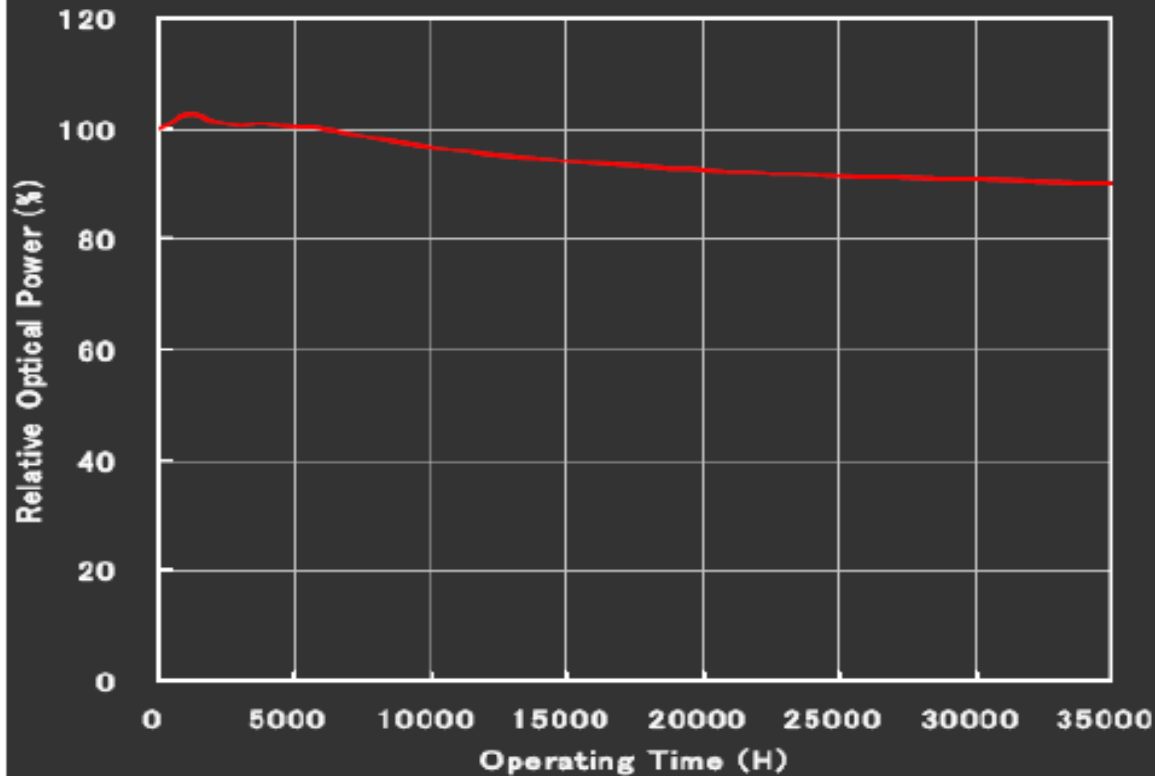


Technical Specifications



NS6L083A Lifetime Data

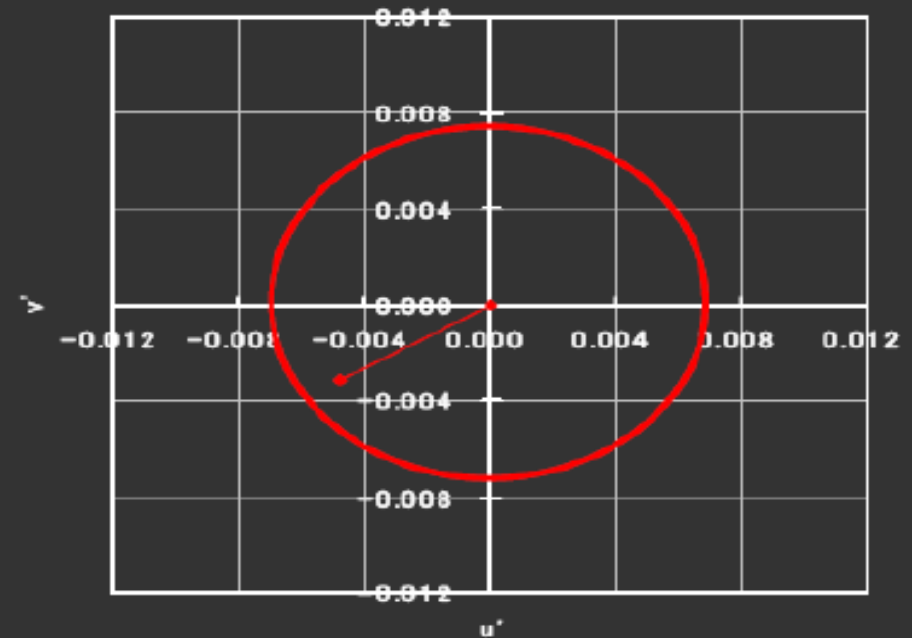
$T_s = 55\text{ }^\circ\text{C}$, $T_j = 63\text{ }^\circ\text{C}$



Energy Star Requirement: L_{70} to 35k hrs

NS6L083A Color Maintenance Data

$T_s = 55\text{ }^\circ\text{C}$, $T_j = 63\text{ }^\circ\text{C}$



**Energy Star Requirement:
within $0.007(u', v')$ over 35k hrs**

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