Demand Side Management in India

Potential, Status and Issues

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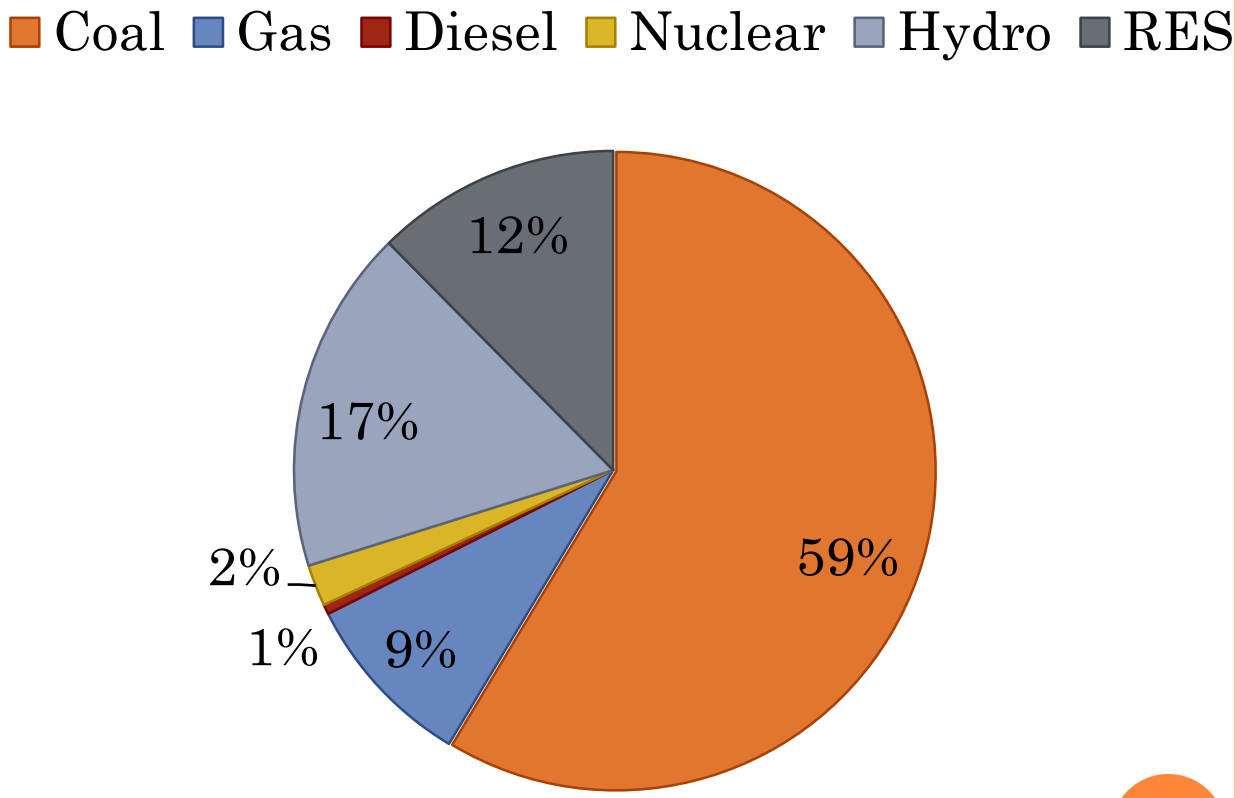
Outline

- Power Scenario in India
- DSM – Regulations, Potential, Pilots, Issues
- Summary

Installed Capacity in MW (August 2013)

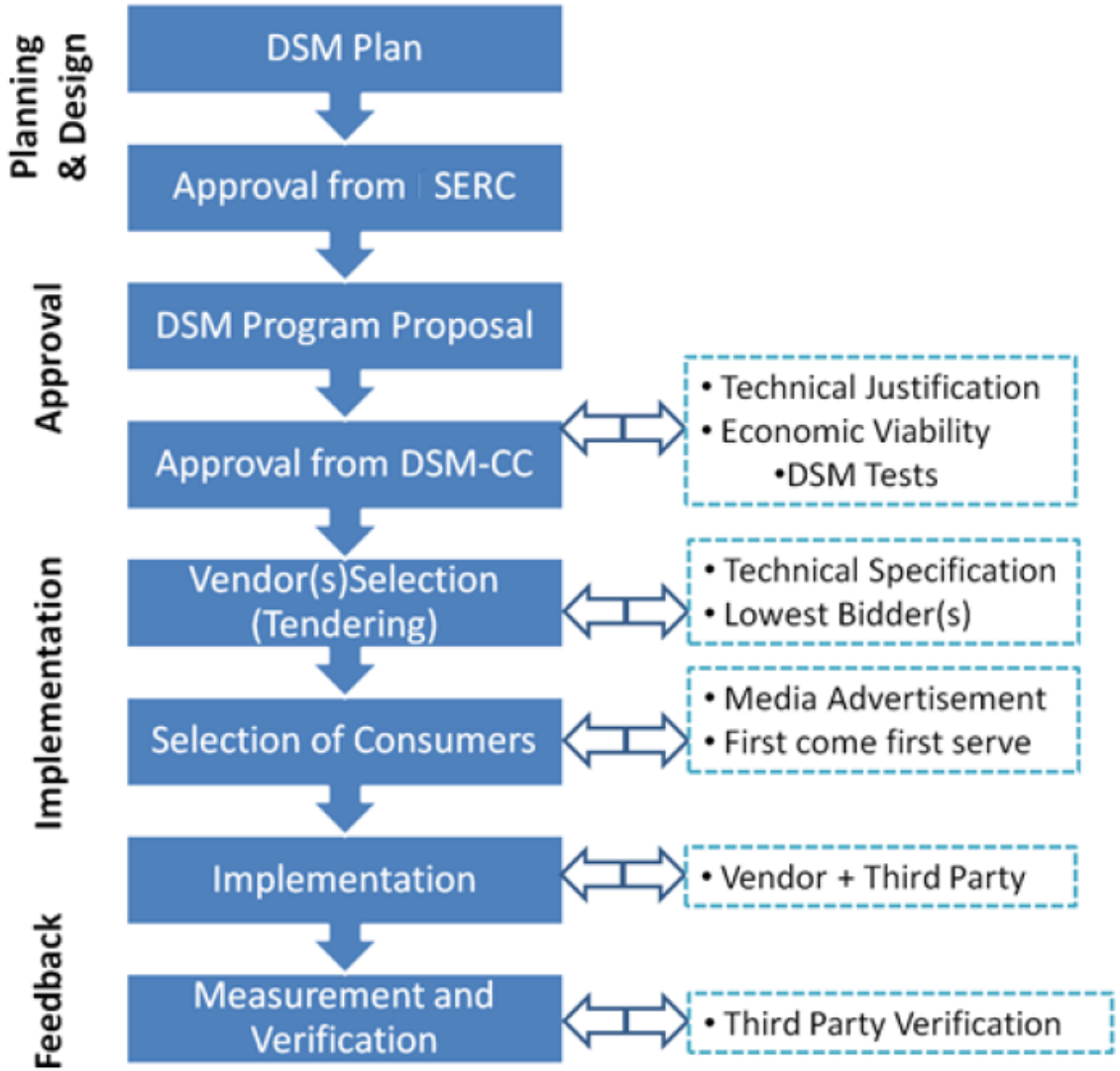
	MW
Coal	133188
Gas	20380
Diesel	1120
Nuclear	4780
Hydro	39624
RES	28185
	227277



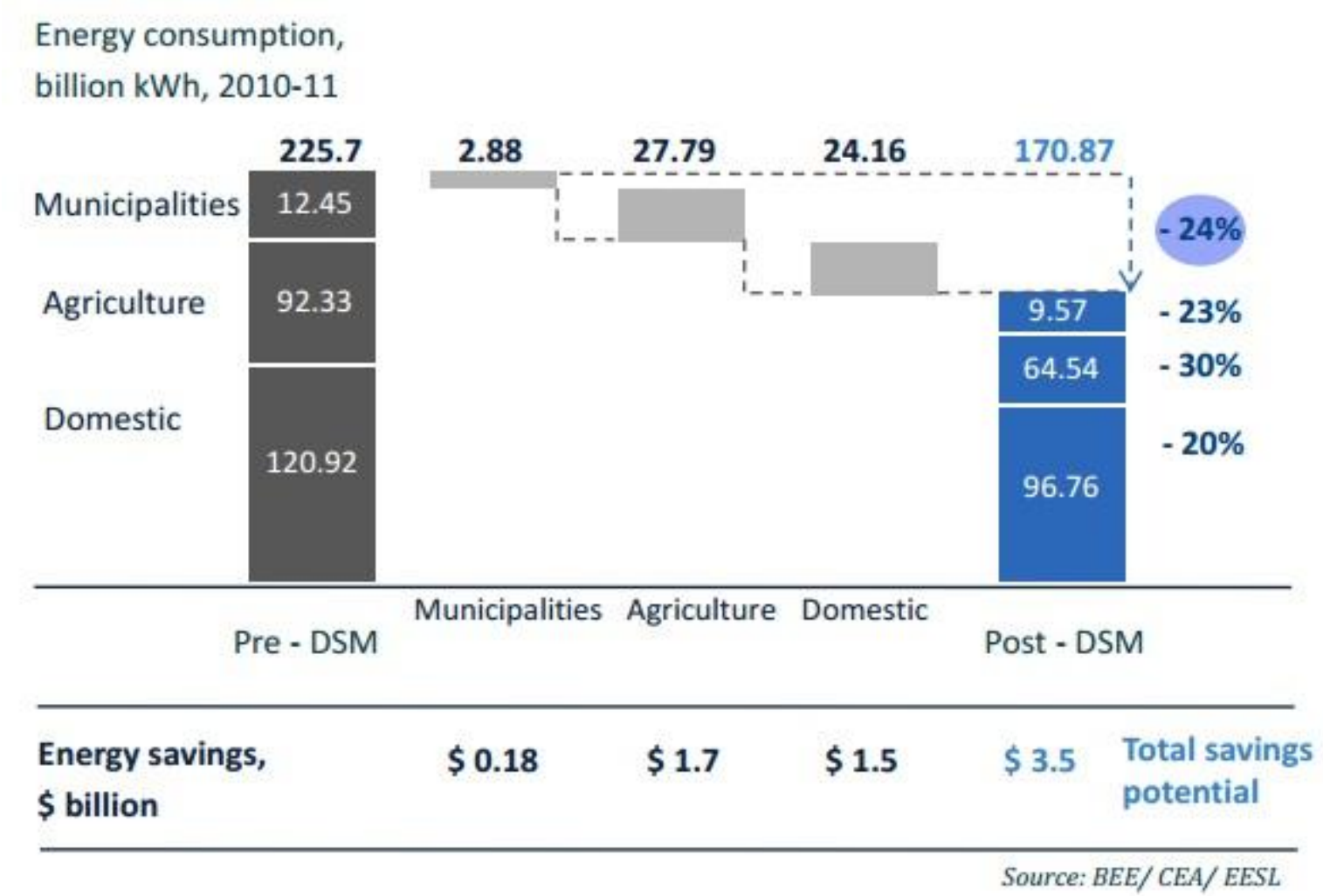
Regulations

- Electricity Act 2003
- CERC Regulations 2010
- State Regulations (10+4*)

Process Flow

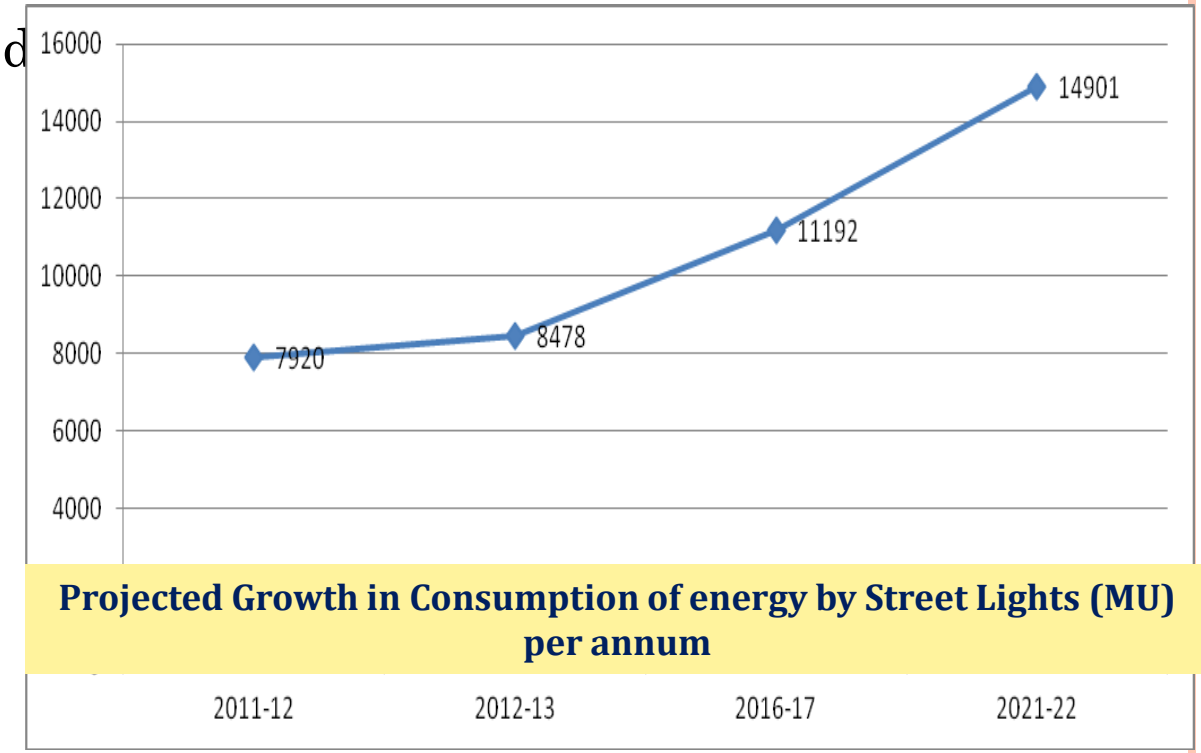


DSM Potential - Example



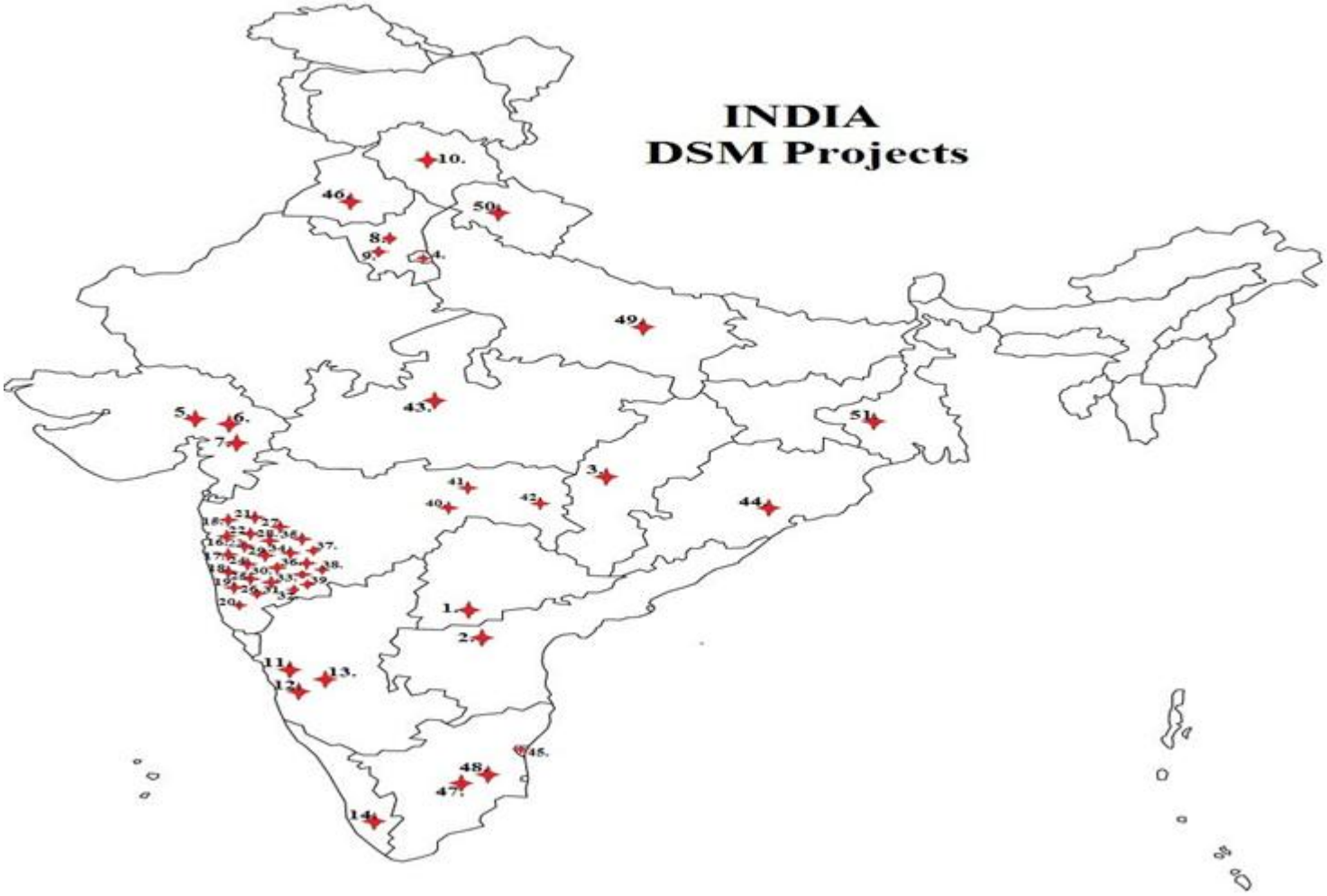
Street Lights - Potential

- 8.5 b KWh consumption annually (2012-13)
  - growing at CAGR of 7%
- Potential savings of 55% possible by retrofits by LEDs
- Additional 15-25% savings by intelligent street light management – daylight savings/ dimming, etc
- Savings of 5 b KWh possible at national level
- Cost savings of Rs. 2500 crores annually (approx US$ 500Mn)
- Investment required
  – Rs. 20,000 crores



Projected Growth in Consumption of energy by Street Lights (MU) per annum

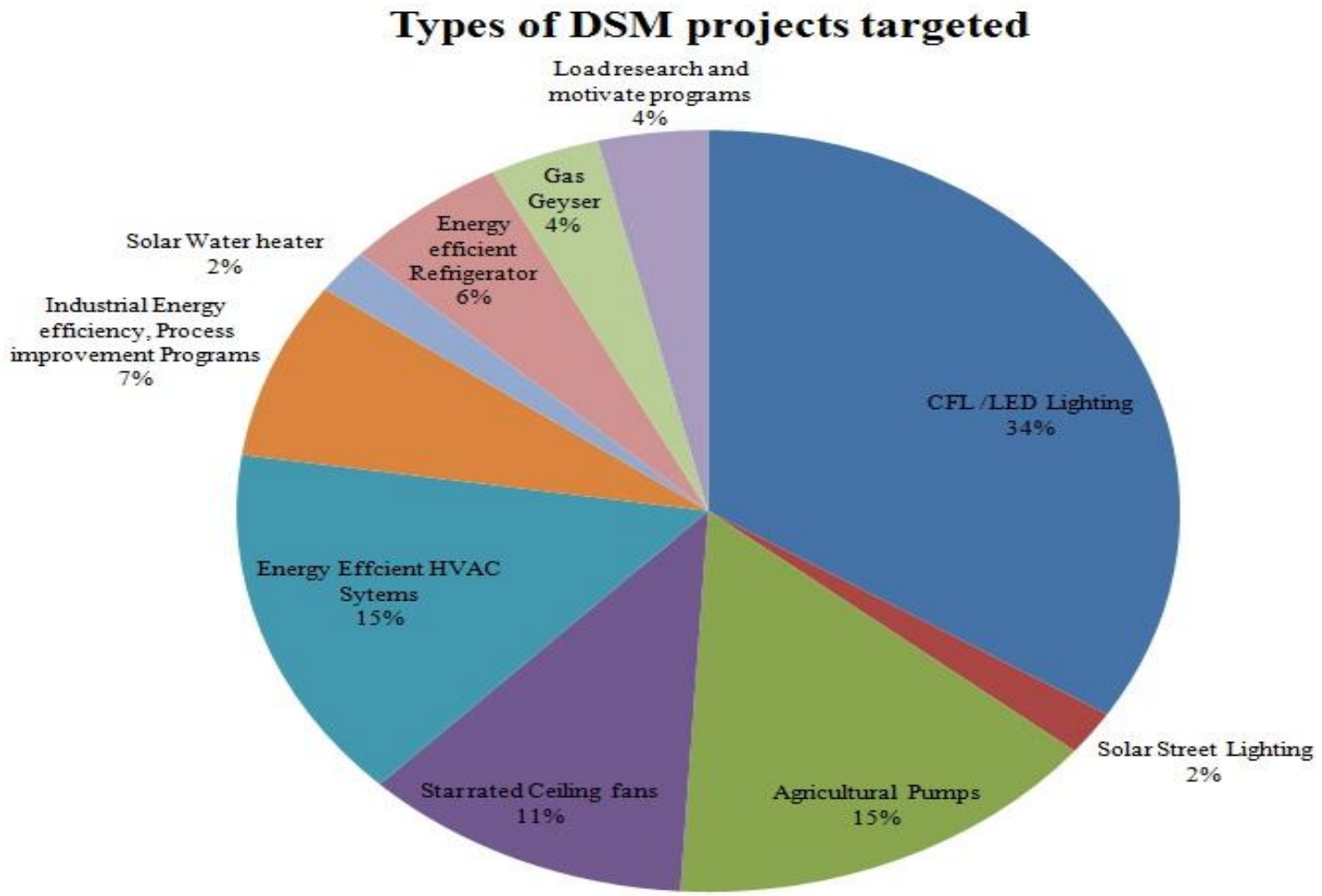
DSM Projects - Pilots



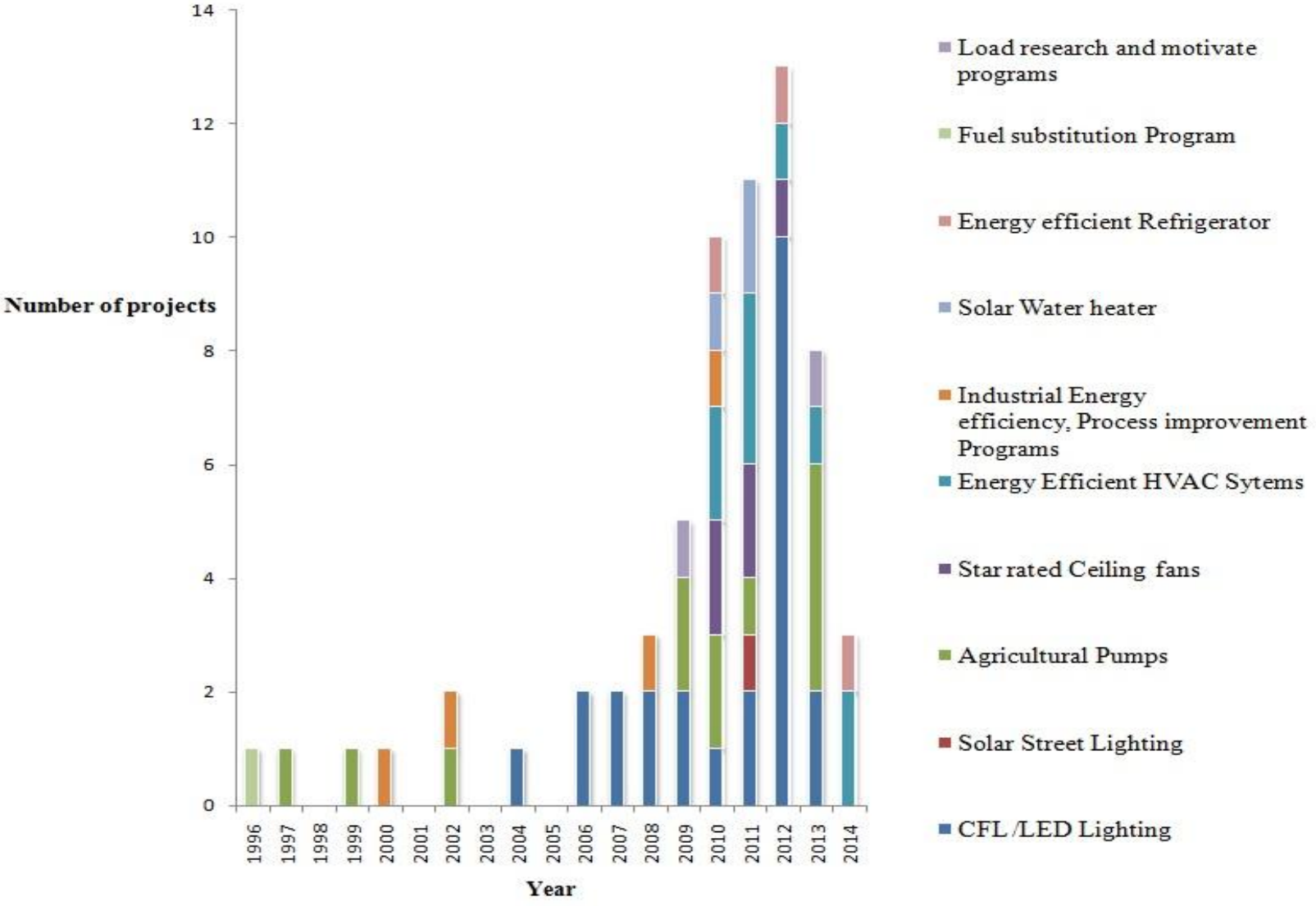
Technology Options

- Lighting
- HVAC
- Refrigeration
- Ceiling Fans
- Thermal Storage
- Agricultural Pump Sets
- Capacitor Bank
- Gas Geysers
- Demand Response (manual)

TECHNOLOGY OPTIONS

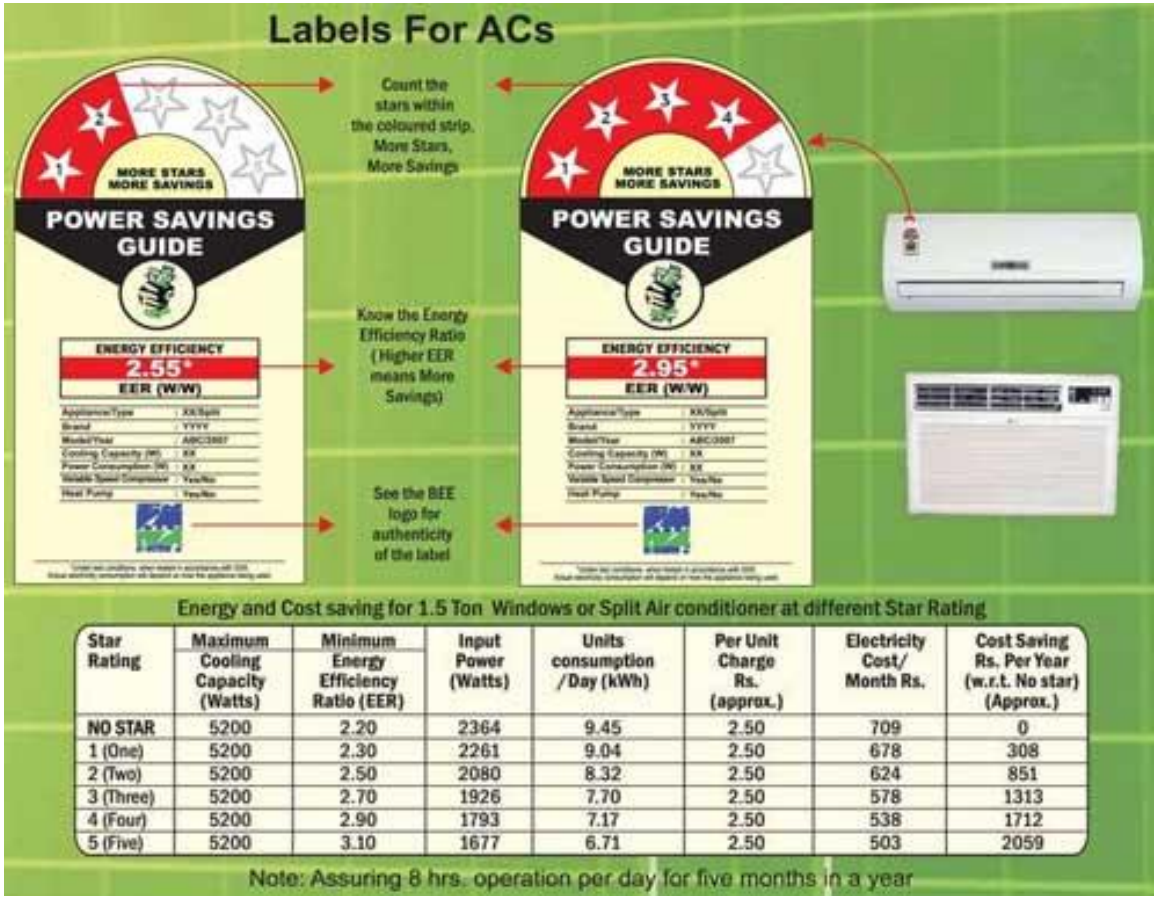


Timeline of DSM Programs



BEE Star Rating Program

- Quite Successful
- Change in efficiency norms/numbers



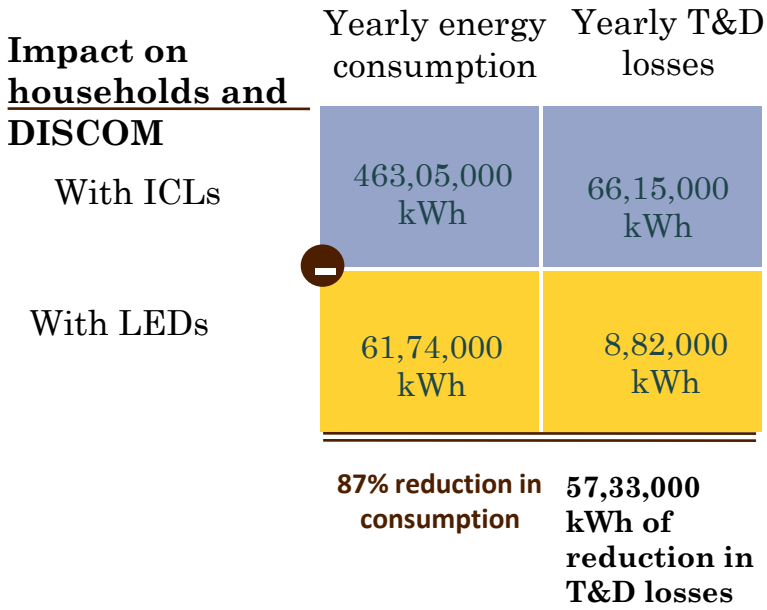
Energy and Cost saving for 1.5 Ton Windows or Split Air conditioner at different Star Rating

Star Rating	Maximum Cooling Capacity (Watts)	Minimum Energy Efficiency Ratio (EER)	Input Power (Watts)	Units consumption /Day (kWh)	Per Unit Charge Rs. (approx.)	Electricity Cost/ Month Rs.	Cost Saving Rs. Per Year (w.r.t. No star) (Approx.)
NO STAR	5200	2.20	2364	9.45	2.50	709	0
1 (One)	5200	2.30	2261	9.04	2.50	678	308
2 (Two)	5200	2.50	2080	8.32	2.50	624	851
3 (Three)	5200	2.70	1926	7.70	2.50	578	1313
4 (Four)	5200	2.90	1793	7.17	2.50	538	1712
5 (Five)	5200	3.10	1677	6.71	2.50	503	2059

Note: Assuring 8 hrs. operation per day for five months in a year

LED- Replacement - Project

Key Parameters	Value
No. of Households	2,45,000
Number of LEDs	7,35,000
ICL Wattage	60 W
LED Wattage	8 W
Usage per day	3.5 Hrs
Operating days per year	300



DELP in Puducherry is being implemented on Standards Offer Programme – this is first such case in India

Puducherry to be recognized as first state in South Asia to switch household lighting to energy efficient LEDs from the conventional ICLs

Source:EESL India

ISSUES/BARRIERS

Structural	▪ **Payment security**: Lack of it increases capital costs ▪ **M & V:** Linking payments to bill reductions prompts non-implementation
Availability	▪ **Baseline**: Inadequate data availability ▪ **Capital constraints:** Inability to finance ▪ **Technology:** Lack of products or channels, Vendors, Grey Market
Behavioral	▪ **Lack of awareness**: About energy efficiency technologies ▪ **High risk perception:** Regarding return on investments ▪ **Low mind-share:** Energy efficiency not usually the primary focus
Regulatory	The Cost-benefits tests in the DSM regulations are not standardized to adjust the variance in the power procurement cost of Private and public utilities

Public Vs Private Utilities

- Cost of Power Purchase
- Benefit-Cost Tests – Power Purchase Impact
- Approval Process
- Seriousness/Ownership

Consumer Perspective

- Likes
  - Concept of Energy Saving
  - New EE appliance @ home with minimum investment
- Dislikes
  - EM&V installations
  - Initial capital cost and hence not very keen
  - Issue with Grey Market price
  - Saving are not very well reflected in electricity bill (ex. Lighting)

SUMMARY

- Government promoting EE in big way
- Huge Potential for DSM
- Most of the projects are sub-critical in size
- Scaling is an issue
- EM&V is a Challenge
- Non-Uniformity of power purchase cost
- State level policy is required

Thank You!

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Acknowledgements


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Energy Generation

During Apr'13-Aug'13 in MU (approx)