



# DEMAND SIDE MANAGEMENT IN INDIA

Potential, Status and Issues

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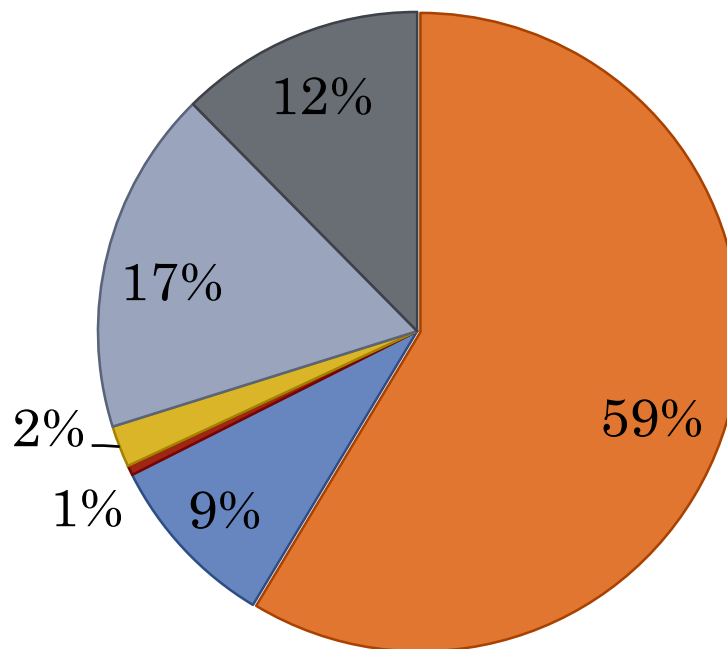
# OUTLINE

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

# INSTALLED CAPACITY IN MW (AUGUST 2013)

■ Coal 
 ■ Gas 
 ■ Diesel 
 ■ Nuclear 
 ■ Hydro 
 ■ RES

	MW
Coal	133188
Gas	20380
Diesel	1120
Nuclear	4780
Hydro	39624
RES	28185
	<b>227277</b>

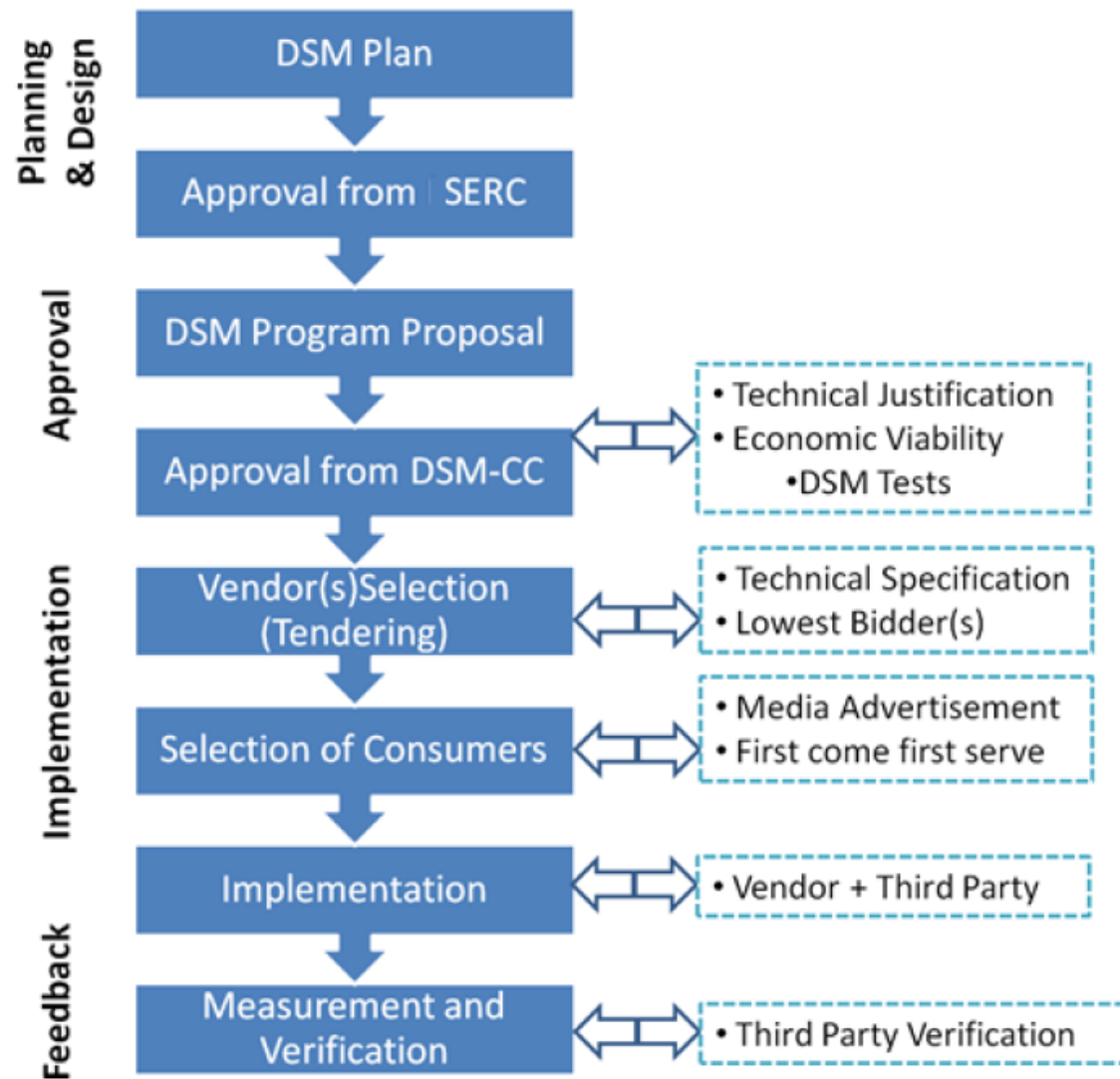




# REGULATIONS

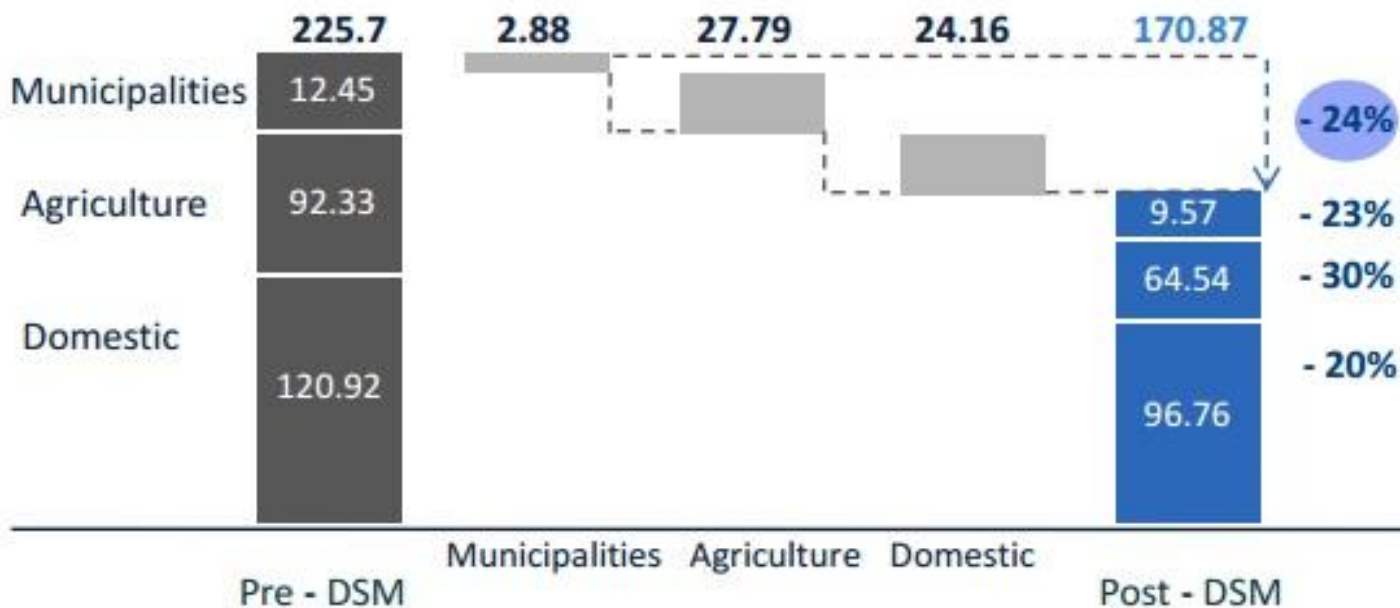
- Electricity Act 2003
- CERC Regulations 2010
- State Regulations (10+4\*)

# PROCESS FLOW



# DSM POTENTIAL - EXAMPLE

Energy consumption,  
billion kWh, 2010-11

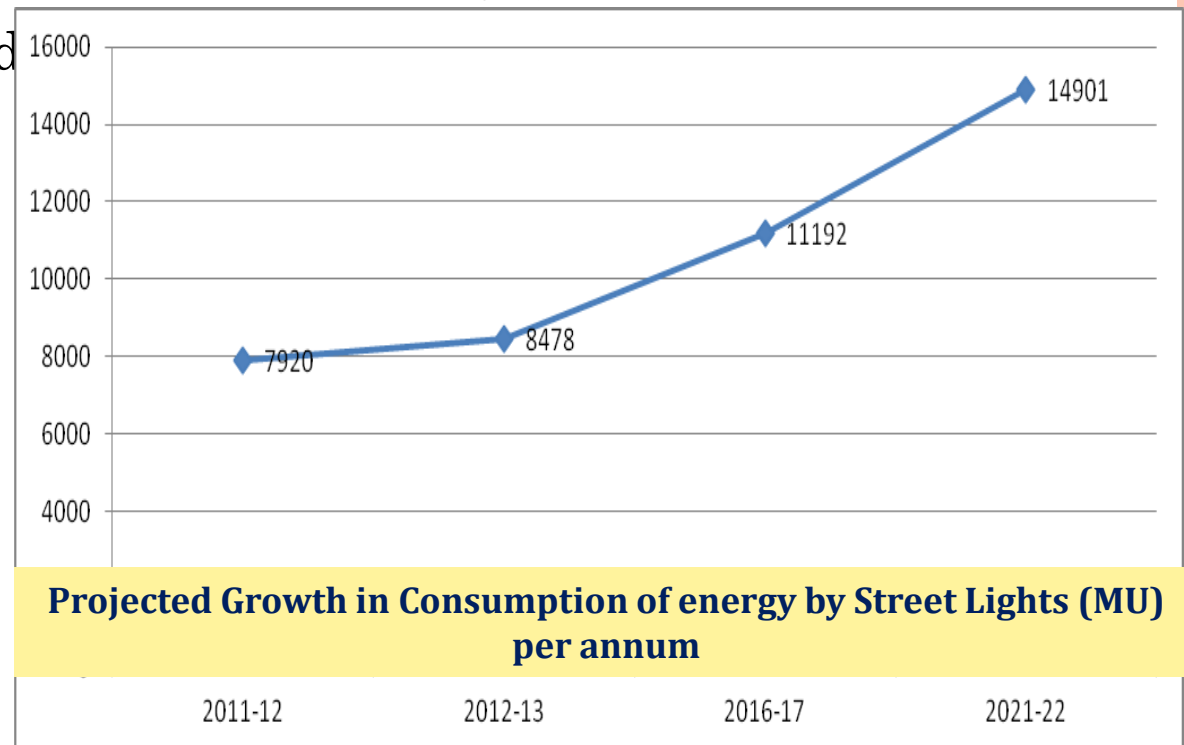


Energy savings, \$ billion	\$ 0.18	\$ 1.7	\$ 1.5	\$ 3.5	Total savings potential

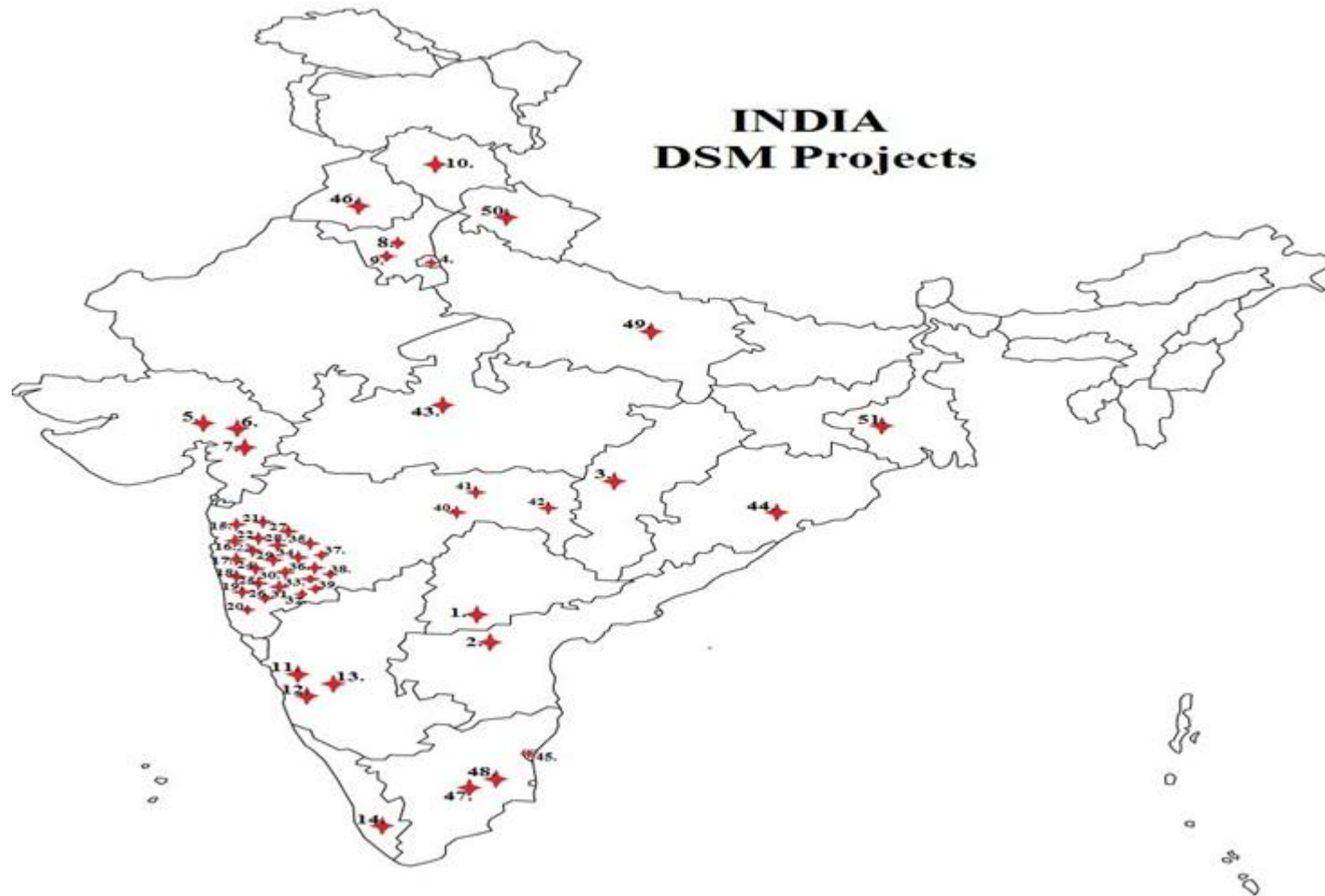
# STREET LIGHTS - POTENTIAL



- 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



# DSM PROJECTS - PILOTS





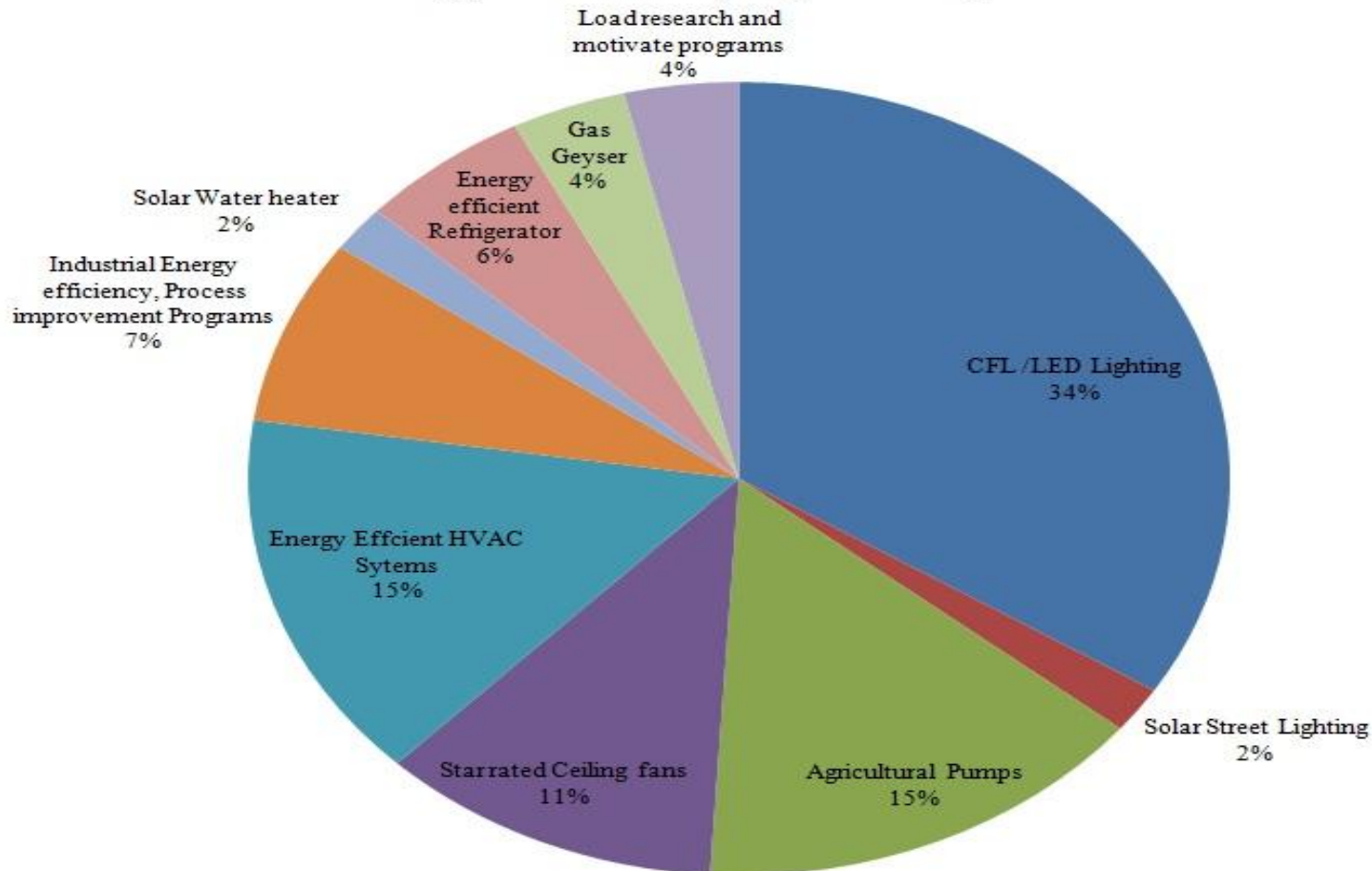


# TECHNOLOGY OPTIONS

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

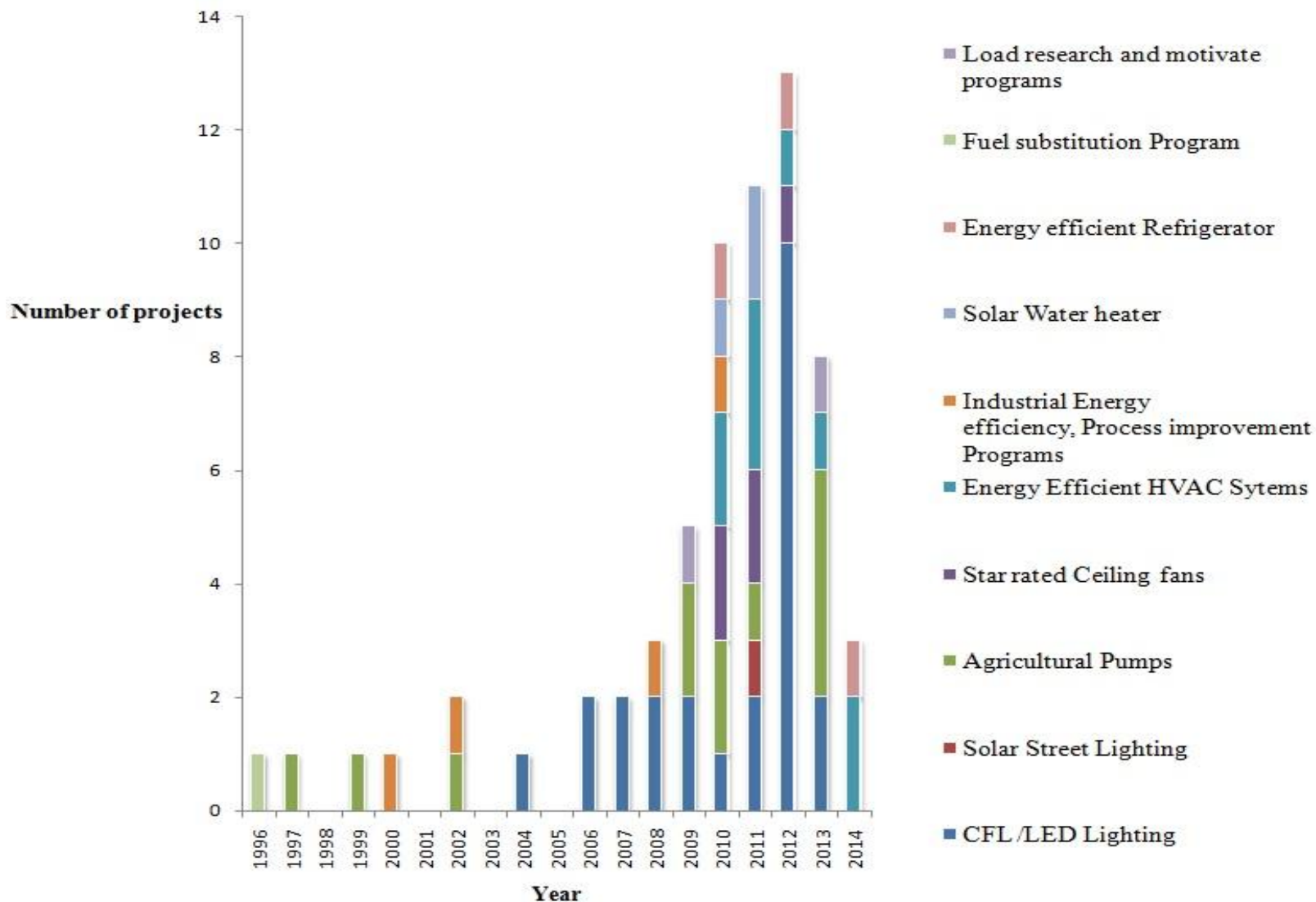
# TECHNOLOGY OPTIONS

## Types of DSM projects targeted





# TIMELINE OF DSM PROGRAMS



# BEE STAR RATING PROGRAM

- Quite Successful
- Change in efficiency norms/numbers



### Labels For ACs



Count the stars within the coloured strip. More Stars, More Savings

Know the Energy Efficiency Ratio (Higher EER means More Savings)

See the BEE logo for authenticity of the label

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

Impact on households and DISCOM	Yearly energy consumption	Yearly T&D losses
	With ICLs	463,05,000 kWh
With LEDs	61,74,000 kWh	8,82,000 kWh
	<b>87% reduction in consumption</b>	<b>57,33,000 kWh of reduction in T&amp;D losses</b>

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*



# 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



**MHRD**  
Govt. of India





# ENERGY GENERATION

DURING APR'13-AUG'13 IN MU (APPROX)

