



**ENERGY EFFICIENCY SERVICES LIMITED**  
A JV of PSUs under the Ministry of Power  
Government of India

***“Creating a Sustainable Environment through  
Transitioning to Clean Energy”***

***11<sup>th</sup> December 2018***



# About ENERGY EFFICIENCY SERVICES LIMITED (EESL)

- Energy Efficiency Services Limited (EESL) is a joint venture company of four Public Sector Enterprises of Ministry of Power, Govt. of India



- NTPC Limited (India's Largest Power Generating Company) Share Capital : 36.36%
- Rural Electrification Corporation Limited (Leading Infrastructure Finance Company) Share Capital : 21.70%
- Power Finance Corporation Limited (Leading Non-Banking Financial Corporation) Share Capital : 36.36%
- Power Grid Corporation of India Limited (India's Largest Power Transmission Company) Share Capital : 5.58%

- Established in the year 2009

- A Super ESCO that seeks to unlock energy efficiency market in India, estimated to be at 9 billion Euro (12 billion US \$), by way of innovative business and implementation models

# EESL's Footprint in India



## Programmes across India



UJALA

36 States & UTs



AgDSM

2 States



SLNP

28 States & UTs



e-Vehicle

4 States & UTs



BEEP

7 States & UTs



Smart Meters

3 States & UTs



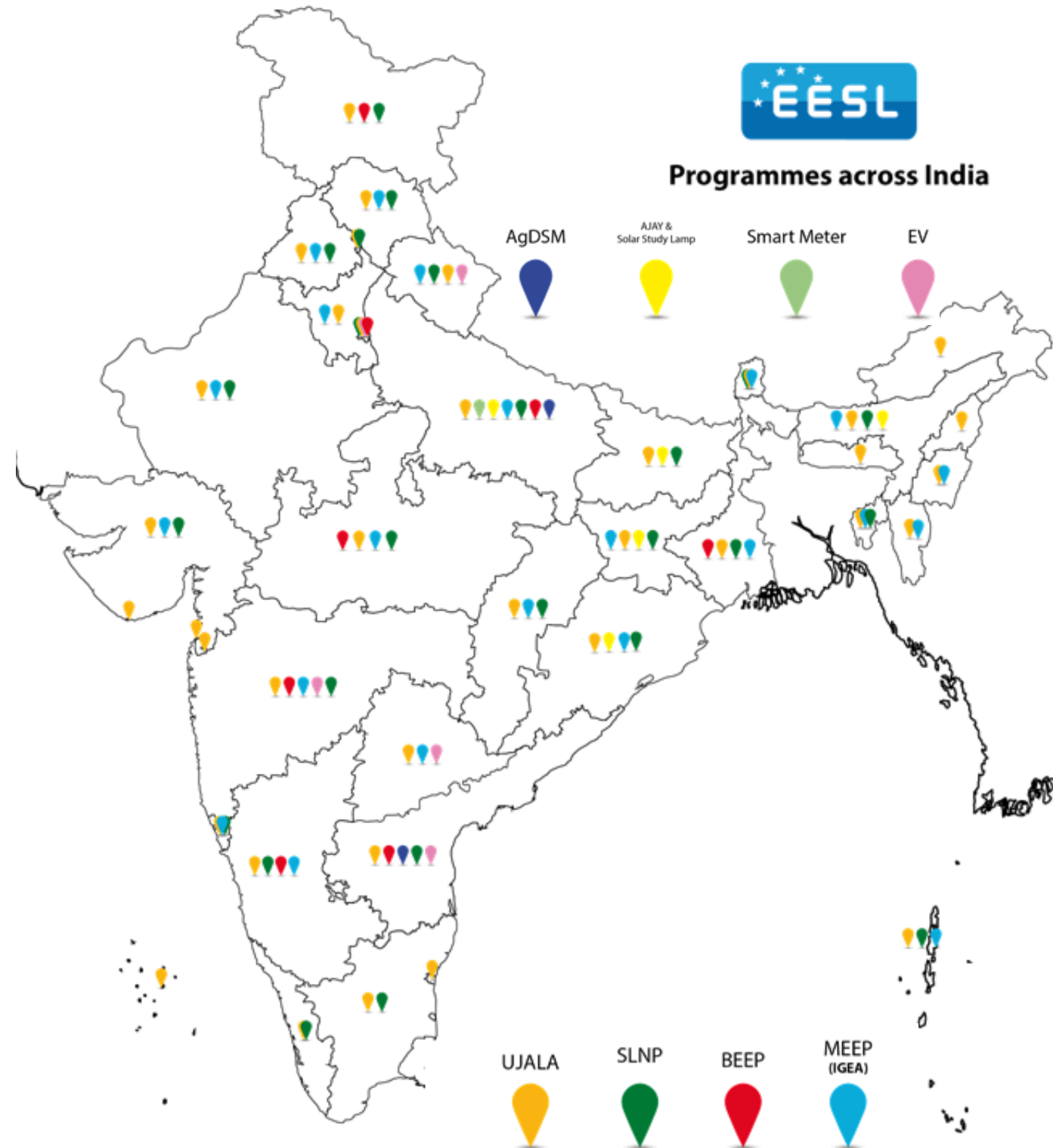
MEEP

25 States & UTs



AJAY

5 States



# #1: Solarization of Agricultural Feeders

- Small solar power plants are being set up on open / unused / vacant lands of Maharashtra DISCOMs sub-stations with size varying from approx. 0.25 MW to 2 MW

Project Period	Scale (MWp)	Annual reduction in Co2 emissions in MT	Total reduction in Co2 emissions during Project life (in MT)
25	200	0.246	6.15



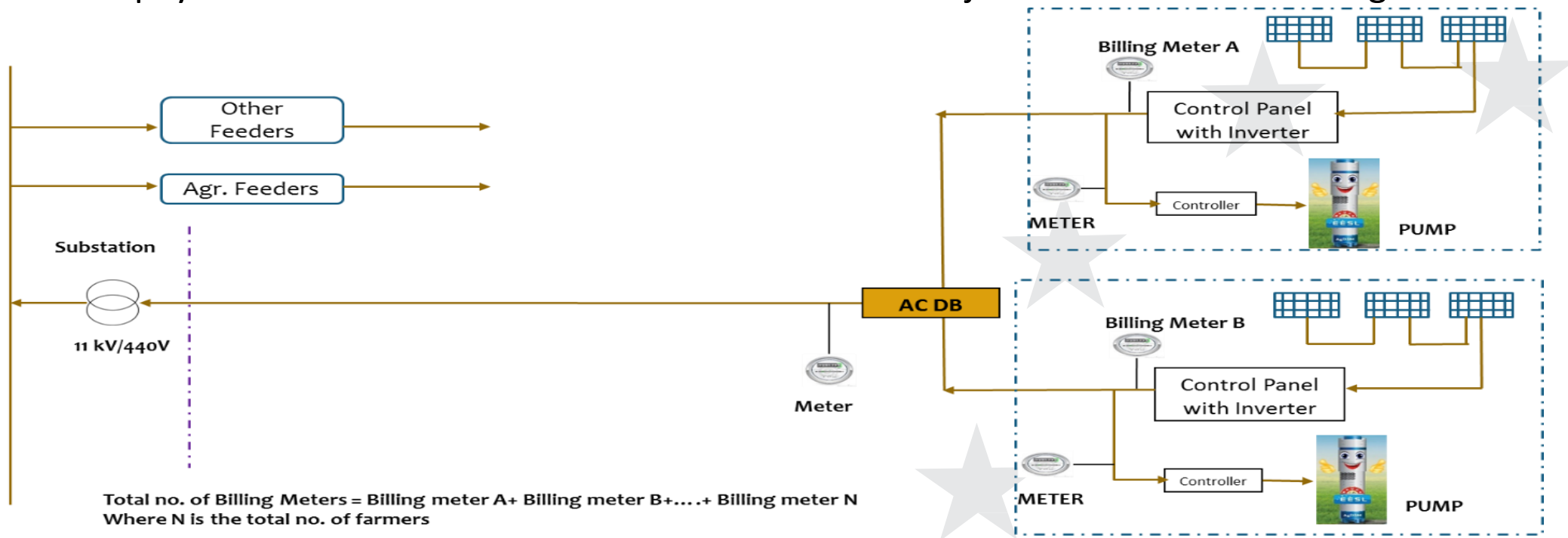
- **Benefits**

- Reduction in transmission losses of approximate 5%
- **Further, if farmer's existing pump sets to be replaced by BEE 5 star rated energy efficient pump set on the feeder, 30% energy savings can be achieved.**

# #2: Solar PV mini grids – Agriculture Pump Sets

- Solar PV mini grid with EE pump set and a Controller will be provided by EESL
- EESL shall finance ,design, install, own and operate a solar PV pumping solution at the site of farmer
- Solar PV pump sets can irrigate the farms during the day time by eliminating dependencies on DISCOM or DGs
- Excess energy generated from mini grid can be exported to the DISCOMs grid
- DISCOM avoids
  - procuring marginal power for meeting agriculture demand
  - T&D losses & network augmentation, since generation is at the tail End of the distribution network
- A cash incentive payment shall be made to the farmer for the net injection into the DISCOM grid

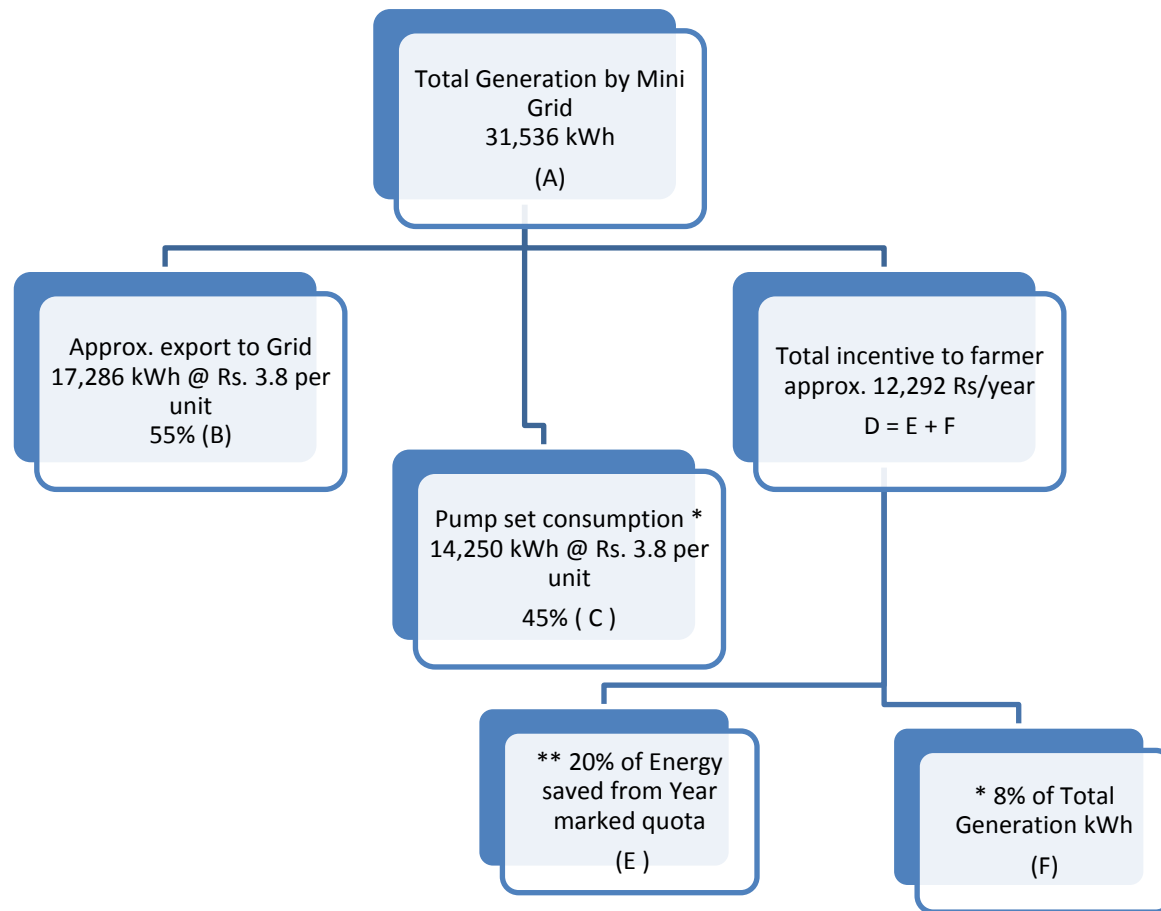
Pump capacity (hp)	Approx. Solar PV (kWp/pump)
3	10
5	15
7.5	20



# Grid Connected Agriculture Pump Sets

## 7.5 HP Pump set

### Illustrative case



Particulars	Details	Remarks
Total Generation	31,536 kWh	
Total consumption by pump sets	14,250 kWh	Paid @ Rs 3.8/kWh * Benchmark consumption =1900kWh/HP/Yr
Net Export	17,286 kWh	Paid @ Rs 3.8/kWh
Revenue to farmers	9587 Rs* + 2705 Rs**	<b>Rs 12,292 /year</b>

- \* 8% of 31536 kWh=2523 Units @ Rs 3.8 /unit ~ **9587 Rs**
- \*\* if farmer saves 25% of Year marked quota i.e. 14,250 ~ 3562 units  
20% of Energy saved i.e. 3562 Units ~ 712 units @ Rs. 3.8/unit ~ **2705 Rs**  
Total Incentive to farmer/Year =9587+2705 ~ **12,292 Rs/Year**

# Benefits of grid connected solar pumping programme

## Farmer

- Increase crop yield due to sufficient irrigation
- Convenience to farmers due to reliable power supply in day-time
- Additional revenue source for savings below benchmark consumption
- Every farmer will receive a star rated pump set with VFD/Controller
- Free repair and maintenance for the contract period

## Government

- Promote social welfare by encouraging agriculture sector
- Provide good quality day time power supply to farmers
- Farmer gets an opportunity to earn additional income
- Encourages energy and water conservation

## DISCOM

- Fulfilment of RPO
- Savings due to reduction in AT&C losses
- No upfront cost for the transmission / distribution network
- Reduction in expensive power purchase
- No additional subsidy support required

# Few Challenges with Renewables (Solar)

- **Low voltage distribution grid:**
  - voltage levels, power factor, higher wear and tear of equipment, etc. from high penetration of a large number of distributed solar generators.
- **Transaction Costs: Another logistical worry for utilities is the significantly higher transaction effort in terms of metering, inspection and certifications.**
- **Incase of large Solar Power Plants where connectivity to be done at high voltage distribution grid**
  - land acquisition, necessary approvals for underground wiring, forest department approvals for tree cutting
  - security of the system, water availability for cleaning of solar PV modules.
  - Off taker payment risk



# THANK YOU



**Rajneesh Rana**

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