

ENERGY EFFICIENT & SOLAR AGRICULTURAL PUMP-SETS

PUNJAB ENERGY DEVELOPMENT AGENCY (PEDA)

PUNJAB AT GLANCE



- Area of Punjab : 5.036 Million Hectares
- Area under Cultivation : 4.20 Million Hectares(83.4%)
- Area under Forest : 0.3 Million Hectares (6%)
- Area under paddy cultivation : 2.8 Million Hectares
- Paddy Straw Availability : 15 Million Ton
- Other Agro Residue : 5 Million Ton
- Installed Power Generation Cap. : 10673 MW
- Power Demand : 49611 MU
- Peak Load : 10568 MW
- Agriculture Power Demand : 10,223 MU
- Population : 27.74 Million
- Cities in Punjab : 22
- Towns in Punjab : 157
- Villages in Punjab : 12673

PUNJAB- ACTIVE IN RENEWABLE ENERGY SECTOR

	BIOMASS POWER	CO-GENERATION POWER	SOLAR POWER	HYDEL POWER	WASTE TO ENERGY	TOTAL
INSTALLED CAPACITY (MW)	63	410	218	135	1	827
TARGETS UPTO 2022 (MW)	300	680	4200	200	1	5400

PRESENT SCENARIO – AGRICULTURE

- No. of Agriculture pump-sets, connected load in MW and Annual AP Consumption in the state as on the end of FY is as under:-

As on	2009-10	2010-11	2011-12	2012-13	2013-14
Nos. (%age growth)	11,05,517 (7%)	11,43,267 (3.3%)	11,63,274 (1%)	11,91,407 (2%)	12,25,066 (2%)
MW (%age increase)	7,379 (21%)	7,728 (4%)	7,925 (2%)	8117 (9%)	8389 (3.3%)
Mus (%age growth)	10469.30 (12%)	10116.89 (-3%)	10248.63 (1%)	10779 (4%)	10223 (-1%)

TYPES OF AGRICULTURAL PUMP-SETS AND ANNUAL ENERGY SAVING POTENTIAL

- Total Number of Agriculture Pump Sets = 12.25 Lacs
 - Mono Block Type = 62.5%
 - Submersible Type = 37.3%
 - Deep Bore Type = 0.20%
- Rated Capacity (in Horse Power) = 3HP-25HP
- Estimated Energy Saving Potential
 - Replacement Mode = 25-30%
 - Retrofitting Mode = 8-12%
- Existing Pump Sets whose efficiency is less than 25% may be replaced with BEE 5-star rated Pump Sets
 - Efficiency of Existing Pumps = 25-30%
 - Efficiency of New Pumps = 55-60%

REPLACEMENT OF 50% EXISTING PUMP-SETS WITH ENERGY EFFICIENT PUMP-SETS

No. of Pumps to be replaced	6.00 Lacs
Energy Consumption of existing pumps	5317 MU
Energy Consumption after replacement	3988 MU
Saving by replacement (25%)	1329 MU
Average cost of pump	Rs. 45,000/-
Investment	Rs. 2700 Cr.
Tariff of A.P. (Tariff order 2015-16)	Rs. 4.58
Saving by replacement	Rs. 609 Cr.
Payback period	5.5 year

50% EXISTING AGRICULTURE PUMP-SETS POWER TO BE REPLACED WITH SOLAR POWER

No. of Pumps to be replaced	6.00 Lacs
Energy Consumption of existing pumps	5317 MU
Total Solar PV capacity required	3544 MW
Average cost of Solar PV Plant	Rs. 5.00 Cr./MW
Investment	Rs. 17720 Cr.
Cost of Generation	Rs. 4.60
Tariff of A.P. (Tariff order 2015-16)	Rs. 4.58
Saving by replacement	Rs. 2435 Cr.
Payback period	9 year
Difference in AP Tariff & cost of generation to be given from viability gap fund through soft loan.(50 Lac)	Rs1772Cr.

50% ENERGY EFFICIENT AGRICULTURE PUMP-SETS POWER TO BE REPLACED WITH SOLAR POWER

No. of Pumps to be replaced	6.00 Lacs
Energy Consumption of existing pumps	5317 MU
Energy Consumption after replacement with energy efficient pump-sets (25%)	3988 MU
Total Solar PV capacity required	2658 MW (886MW)
Average cost of Solar PV Plant	Rs. 6.00 Cr./MW
Investment (-Rs 4430 cr)	Rs. 2700 cr +Rs. 13290 Cr = Rs. 15990 cr
Levelized cost of Generation	Rs 4.60 per unit
Tariff of A.P. (Tariff order 2015-16)	Rs. 4.58
Saving by replacement	Rs. 1826 Cr.+ 609= Rs.2435
Payback period	7.5 year
Difference in AP Tariff & cost of generation Pay from from savings due to EE Pumps.(50 Lac)	Rs. 1329 Cr.

BENEFITS

- In case 50% existing pump-sets are replaced with energy efficient pump-sets, then investment made is paid back in 5.5 years
- In case 50% existing pump-sets are provided power from Solar Power Plants, then investment of Rs.17720 Cr. is paid back within 8.5 years with viability gap fund financing.
- In case 50% energy efficient pump-sets are provided with Solar Power Plants, then investment of Rs15950 Cr. is paid back within 7.5 years with viability gap from savings due to EE Pumps

BENEFITS.

- In case energy efficient pump-sets are provided there will be a saving of Rs. 6000 cr in 10 yrs after payback period.
- Govt. saves Rs. 29,216 crore in balance 16 yrs after achieving pay back of investment in 9 yrs, keeping in view that the life of solar power plant is 25 yrs.
- Govt saves Rs. 33,000 Cr. in balance 18 yrs with Solar plus EE Pumps.



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