



NOTE ON WORK SHOP ON
“SOLARISATION OF AGRI PUMPING”
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Summary Report

BACKGROUND AND CONTEXT:

Water is the basic requirement for agriculture. According to reliable reports, there are nearly 25 million (2.5 crores) pumps in India, out of which 1.75 crores work with electricity and 0.75 crores with diesel. Solar pumps have been introduced many years back but have gained adequate acceptance in numbers in the recent past.

Ministry of New and Renewable Energy (MNRE) and many other state governments have come up with rooftop solar policy. Simultaneously solar pumps have proved successful as standalone units in remote farms as well as off-grid mode. A few experiments such as Dhundi village in Gujarat have demonstrated that grid connected solar pumps can provide an additional source of income to the farmers when power is not needed for pumping. The pumping requirement is for only 55 – 60 days in a year. Power produced during the remaining period can be used for other purposes or fed into the grid for extra income to the farmers.

Use of solar power for pumping is indeed a win-win since requirement of power and water are both intermittent and fortunately converge in terms of time. With exponential drop in the price of solar system, economics also favour solar power as against grid power on merits. If the cost for producing power from diesel is counted, there is blind need to go for solar without any loss of time to replace diesel.

In our country power sector is facing massive distortion due to subsidized or free power to the farmers. There are some gains out of these policies but problems created by such interventions are far more serious in nature and quantum. With the consumption of around 18 – 20% of the total by agricultural sector, pumping of water is the single most factor for troubles of government utility companies. It is therefore essential that a completely out of box and objective appraisal is done by all the stakeholders.

For solarisation of agri pumping on massive scale, known or unknown constraints can be effectively tackled by measures like:

- Redesigning of pumps and motors for massive improvement in efficiency
- Linking of such pumps to micro irrigation system to achieve exponential savings in water consumption.
- Involving and persuading financiers active in solar space for industries and institutions or by attracting HNI's or institutions for investment.
- Motivating utility companies for replacing regular pump connections with solar pumps.
- By working on innovative models like stand alone, micro grid, rental pumps etc.
- Even if 40% of all the pumps in India are put on solar, overall business in the next ten years can be around 4,00,000 crores assuming each pump cost as Rs.4,00,000/-.

DISCUSSIONS:

Areas of Improvement:

- Improvement in electrical equipments
- Focus on high efficiency motors

- Combining solar with wind energy
- Combining water saving devices and products with solar
- Cluster farming
- Working out life cycle cost
- Working out floating solar
- Pump efficiency measurement in terms of litres for every watt of power
- Advocacy with government to emphasise efficiency

Integration of Solar Pumps with Micro Irrigation System & other Water Saving Devices:

- Piloting – Central pumping solution to group of farmers (50–60 acres) as a pilot project
- Redesigning of pumps and motors for massive improvement in efficiency. Linking of such pumps to micro irrigation system to achieve exponential savings in water consumption.

Different Installations and Business Models:

- Stand alone
- Micro grid/decentralized distributed grid
- Grid connected
- Integrated micro grid with green house, food processing, cold room etc. in combination with wind, biogas, biomass etc.
- Integrated business activity models in rural areas
- Pumping requirement is 55-60 days in a year. Power produced for the remaining days can be either used through decentralized micro grid or by feeding into main grid. Thus, farmers can become “prosumers” (being customers and producers).
- Farmers can thus have a new stream of income as demonstrated in Dhundi in Gujarat.

Availability of Finance:

- Ownership, financing and management can be worked out suitably to make farmtop solar power a viable business model.
- Involving and persuading financiers active in solar space for industries and institutions or by attracting HNI's or institutions for investment.
- To evaluate the cost of connected solar project – Capex – operating cost – T & D losses – Installation cost etc.
- To look for different finance options – CSR is also a good choice.
- IRR for piloting, installation, monitoring, servicing etc.

Recent Developments:

- Signing of 2,000 pump projects by Shakti Pumps.

- Consideration of finance on priority by NABARD
- Project on centralized pumping to a village from one location by creation of water grid.

Outcomes and Further Action:

- Agreement on huge potential for solar pumps
- Accelerated thrust on replacing diesel pumps with solar pumps without losing time.
- Development of rental models for small and marginal farmers
- Small cooperative models for Bihar and Eastern U.P.
- Work on floating solar and pumping and demonstration of the application in canals and dams
- Improvement on efficiency of motors to reduce overall power requirement.
- Improvement of system efficiency by looking at all elements to reduce overall system cost.
- Integrating solar with micro irrigation system and showcasing economics to the actual users including small and marginal farmers
- Development of smaller pumps of 0.2, 0.5 & 1 KW capacity for distribution all over the country.

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