



AGRICULTURAL DEMAND SIDE MANAGEMENT & MUNICIPAL DEMAND SIDE MANAGEMENT





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OBJECTIVES OF THE PROGRAMME- AgDSM



- Establishment of Regulatory Framework for Promotion of Star rated Energy Efficient Pump sets (EEPS)
- Awareness and capacity building of stakeholders and pump technicians.
- Creating awareness among farmers by using print media and electronic media channels.
- Demonstration project on “IoT and sensor based Climate Smart Agriculture Initiatives”.
- Preparation of DPRs for AgDSM programme



AGRICULTURAL DEMAND SIDE MANAGEMENT: OVERVIEW



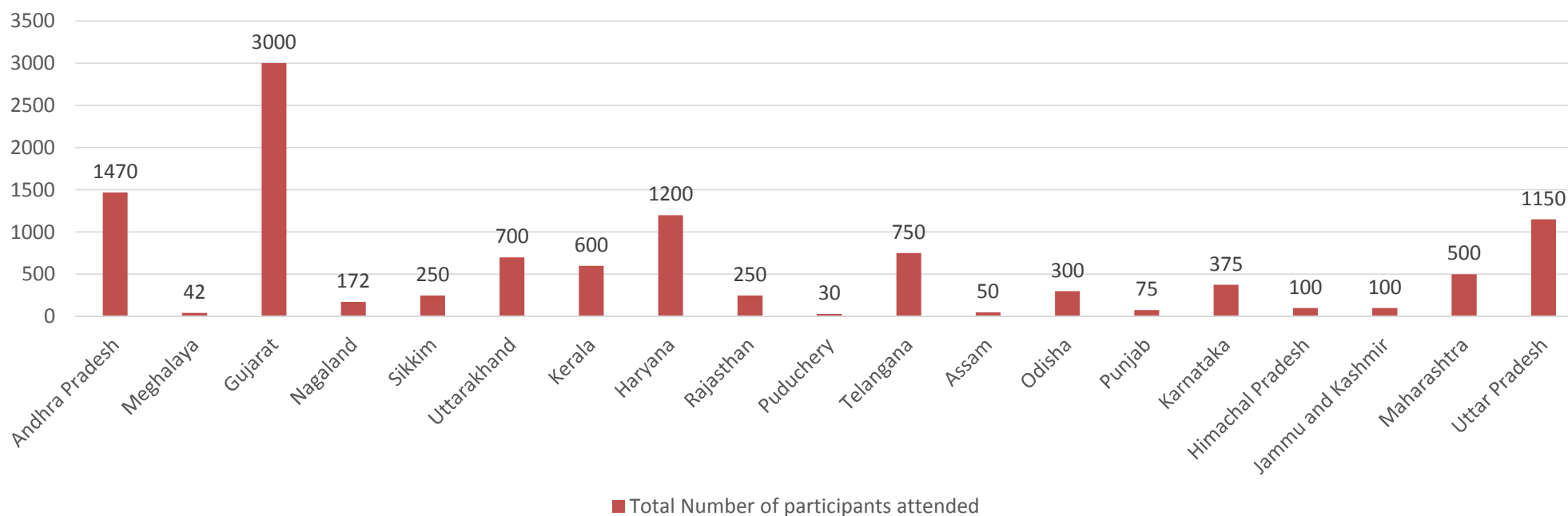
- ❖ Agricultural DSM offers a unique way to influence and change the equipment buying habits of end use consumers so that they prefer to adopt EE technologies.
- ❖ The major activities carried out under AgDSM programme during 2017 to 2020 are as follows:
 - MoU has been signed between BEE and ICAR to provide training and awareness programmes for farmers/stakeholders/pump technicians on “Energy and water conservation”, promoting the use of Energy Efficient pumpsets in agriculture sector.
 - Till now, 155 farmer training workshops have been conducted by SDAs through KVKs / ATARI on “Energy and water conservation”.
 - Around 11,114 farmers/ pump technicians attended and benefitted by the workshops on best practices on overhauling and maintenance.



ACHIEVEMENTS UNDER AgDSM PROGRAMME



Capacity building programmes for farmers





FUTURE INTERVENTIONS UNDER AgDSM



Apart from the continuing programmes, following intervention under AgDSM shall be made:

- ❖ Energy Efficiency in Integrated Cold-chain
- ❖ IoT and Sensor based agriculture Practice
- ❖ Energy Efficiency in Aquaculture (Fisheries) through use of Energy Efficient Aerators



ENERGY EFFICIENCY IN INTEGRATED COLD-CHAIN



RECOMMENDATIONS

- 01 Establish **guidelines for good practices in operation** and maintenance
- 02 Establish **guidelines for energy efficient design**, equipment specifications and material selection
- 03 **Enhance awareness** about energy efficiency in post-harvest management.
- 04 Develop **standards and labelling** for pre-cooling and staging cold room refrigeration equipment.
- 05 Introduce framework for **energy-use reporting and benchmarking**
- 06 Develop **training and certification** on energy efficient cold-chain operation
- 07 Encourage adoption of **financing mechanisms** to facilitate the adoption of energy efficiency measures



IoT AND SENSOR BASED AGRICULTURE PRACTICE



- ❖ The main objective of this project is judicious water usage, the operation of solar driven agriculture pump guided by automatic soil moisture sensors regulating the operation of drip, sprinkler or generic water flow to the irrigation network.
- ❖ The model will ensure the assured irrigation outreach to small and marginal farmers resulting in improved agricultural productivity and doubling farmer's income while aligning to the objectives of water use efficiency and energy conservation.
- ❖ Scaling of interventions at district or block level, will translate to valuable causes of water conservation and overall water sustainability.



ENERGY EFFICIENCY IN AQUACULTURE (FISHERIES) THROUGH USE OF ENERGY EFFICIENT AERATORS



- ❖ Artificial aeration is very much essential for survival of intensively cultured aquatic flora and fauna. The Dissolved Oxygen (DO) level of culture environment has direct influences on species growth fertility, survival rate, feed intake and digestion Drop in the DO level below the critical level can induce stress for aqua cultural species.
- ❖ Surface aerators are used to break up or agitate the surface of water bubbles so that oxygen transfer takes place. For aeration purpose, Diesel and other internal combustion engines are being in use and have much lower energy efficiencies (approx. 25-30 %) than EE Electric motors coupled with aerators (approx. 80-90%).
- ❖ To promote the EE in inland aquaculture (fisheries) sector, BEE would launch a widespread programme to create awareness and capacity building of the officials/ stakeholders/ farmers of related field on the use of Energy Efficient Motor coupled aerators.





MUNICIPAL DEMAND SIDE MANAGEMENT: OVERVIEW



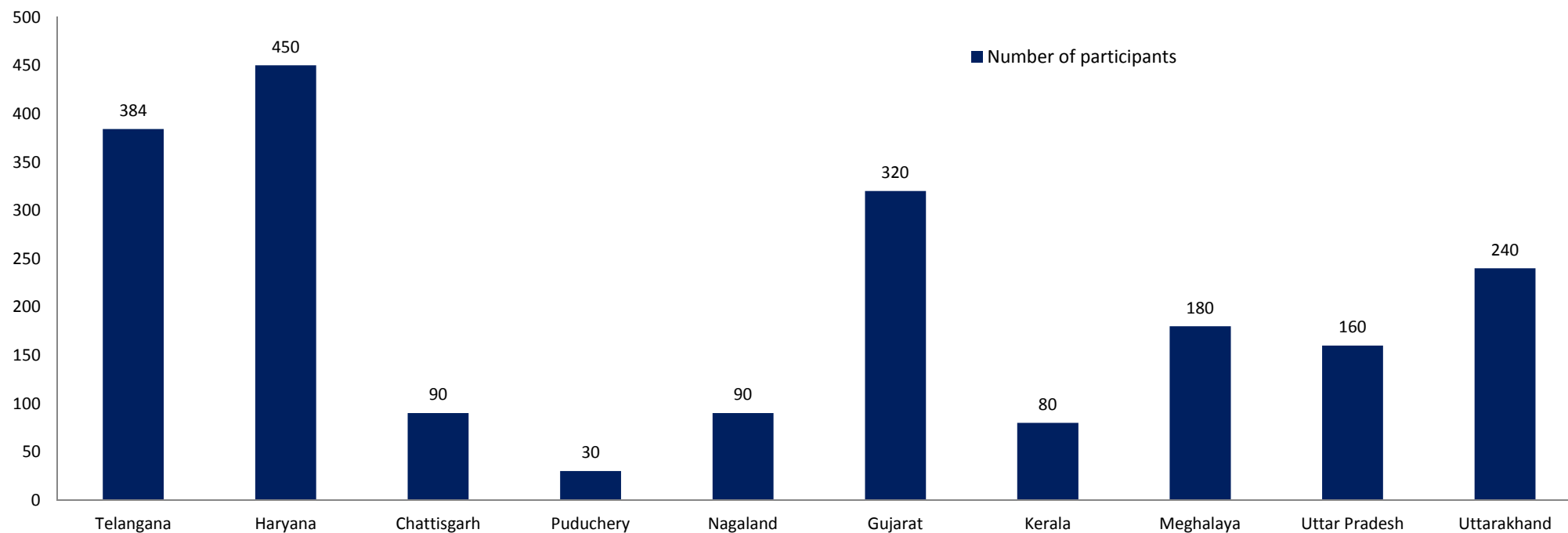
- ❖ In order to tap the energy savings potential of municipalities, BEE initiated nation-wide Municipal Demand Side Management (MuDSM) programme to address Energy Efficiency in drinking water and sewage water pumping system, street lightning and public building across the urban local bodies (ULBs) and Municipalities.
- ❖ The major activities carried out under MuDSM programme during 2017 to 2020 are as follows:
 - Capacity buildings workshops for ULBs, public water bodies, urban development departments and other implementing agencies in cities under AMRUT project
 - Conducting training programs for pump technicians and operators of municipal systems
 - Under MuDSM programme, Capacity buildings workshops for the officials of Urban Local Bodies (ULBs), Public Water Bodies, Urban Development Directorates (UDDs), Municipal Corporations (MCs) and other implementing agencies in cities under AMRUT project have been conducted with an aim to promote and ensure the use of EE pumpsets in drinking water and sewage water pumping system.
 - Till now several workshops under MuDSM programme have been organized in around 10 states Nationwide with over 2500 participants.



ACHIEVEMENTS UNDER MUDSM PROGRAMME



Capacity Building Workshops for ULB's and other Urban bodies





FUTURISTIC APPROACH- FRAMING POLICIES ON DISTRICT COOLING SYSTEM (DCS)



- ❖ A District Cooling Systems (DCS) distributes cooling in the form of chilled water from a central district cooling plant to multiple buildings / establishments through a distribution network of insulated, underground pipes for use in space and process cooling.
- ❖ District cooling systems are generally operated from a central location from where chilled water is supplied to the consumers (buildings). The viability of district cooling plant lies in densely diversified load including commercial and residential buildings.
- ❖ BEE may grab this opportunity to provide the support in implementing District Cooling System (DCS) by hiring the consultant for preparing the policies and workable framework for it.



DISTRICT COOLING SYSTEM – OVERVIEW



District cooling is centralized production & distribution of cooling energy to multiple end users

1 Central Cooling Plant

- Vapour compression or absorption chillers with low GWP refrigerants produce chilled water for cooling needs.

2 Chilled Water Circuit

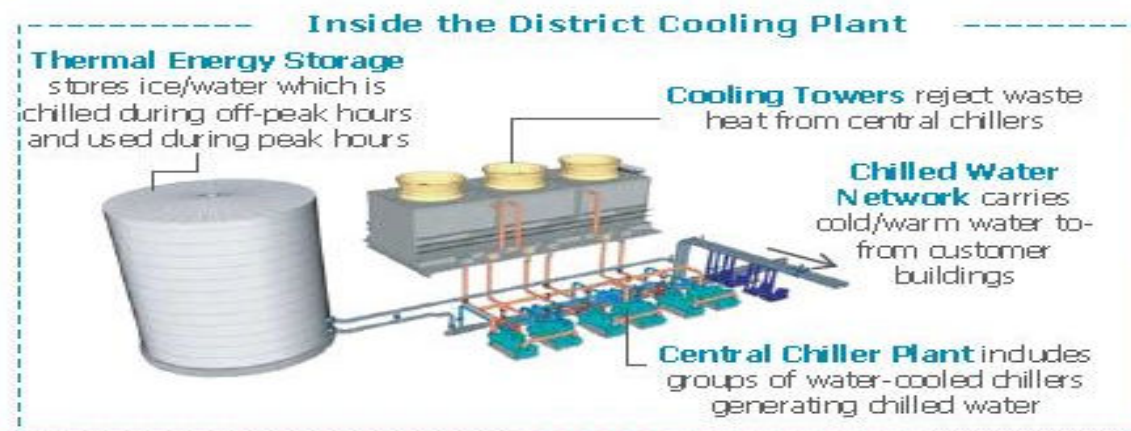
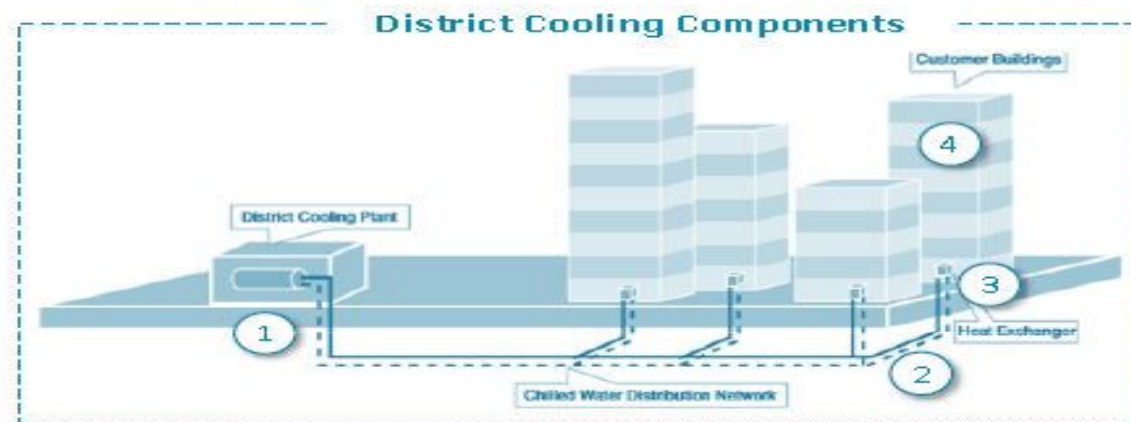
- Consists of pre-insulated pipes for carrying chilled water (supply) and warm water (return), evaporator, primary and secondary pumping system.

3 Energy Transfer Stations

- Facilitates transfer of cold from chilled water network to buildings. Hydraulically separated between primary (high) and secondary (low) side.
- ETS system comprises of heat exchangers, pumps, valves and instrumentation and is typically located in the basement/mechanical room.

4 Low-side (internal water circuit)

- A water circuit in the customer's building circulates the cold water throughout the entire building from the Energy Transfer station in the basement through supporting pumps.





Thank you!