

CHALLENGES

Indian municipalities are facing the challenges of acute water shortage, increasing population and rising power tariffs. Presently only about two-thirds of the urban population has direct access to clean, affordable and reliable water services. Lack of reliable water supply affects urban populations in multiple ways, having detrimental health impacts and significant social and economic costs. Energy costs constitute up to 60-70 percent of an Indian municipality's total cost of pumping water to its residents. This financial constraint, coupled with inadequate or antiquated infrastructure and the lack of adequate managerial and technical capacities, greatly limits the ability of municipalities to improve water services. More efficient water delivery systems can translate into measurable energy savings due to reduced pumping requirements. Yet, most municipalities are unaware of the benefits available through water and energy efficiency. These challenges are further compounded by the lack of state level policies to encourage municipalities to implement water and energy efficiency measures to improve service and reduce costs.

OBJECTIVES

The main objectives of the India Watergy Program are to:

- Raise awareness among municipalities of the tremendous cost savings resulting from simple water and energy efficiency measures.
- Build in-house technical and managerial capacity of municipalities to undertake energy audits and implement energy savings measures.
- Help municipalities become financially sustainable and improve the reliability of water services to urban households.

APPROACH

The Alliance to Save Energy, in partnership with the U.S. Agency for International Development and the U.S. Asia-Environmental Partnership, is designing sustainable Watergy solutions for Indian municipalities to take advantage of opportunities that reduce energy use, water waste and costs, while at the same time improving water services. The India Watergy Program is assisting municipalities in the states of Andhra Pradesh,

Karnataka, and Maharashtra. The general approach of the Alliance in India is to enter into partnerships with state-level urban development agencies in all of the states, in parallel with interventions on the municipal level.

RESULTS

In May 2002, the Alliance launched its first statewide municipal water and energy efficiency outreach program in the state of Karnataka to disseminate Watergy concepts. As part of the institutional capacity building process, the Alliance established and trained an Energy Management Cell (EMC) at the Karnataka Urban Infrastructure Development Finance Corporation (KUIDFC), which now serves as a resource center on water and energy efficiency best practices for municipalities statewide.

The Alliance and KUIDFC selected four pilot municipalities of varying sizes in different state revenue divisions to demonstrate Watergy methodologies. These municipalities were Hubli-Dharwad, Mysore, Bellary City and Tiptur-Arasikere. The Alliance, along with its technical partner The Energy Resources Institute, facilitated energy audits of bulk water supply systems and efficiency assessments of street lighting systems. The audits found that huge energy savings could be realized with limited investments and rapid payback periods. The recommended energy efficiency measures were of two types: no and low cost, and high cost.

The no/low cost measures usually have a payback period of less than a year and involve measures such as surrendering of excess contracted electric demand, maintaining a good power factor, improving water flow distribution, rescheduling pump operation, and improving pumping efficiencies. These simple measures account for about 15-20% of the energy and financial savings. High cost measures include replacing inadequate pipelines, replacing impellers, installing energy efficient motors, and replacing inefficient pumps with energy efficient pumps that are better integrated to the system.

After the audit reports were finalized, each municipal corporation committed to implement energy savings measures. These measures often have wide reaching impacts. Surrendering excess demand, for example,

relieves the load on the electric utility and enables the supply of power to unconnected households. The simultaneous reductions in municipal water waste, through more effective supply and distribution, allows the municipalities to reach water to more homes. As a result of the Watergy successes in Karnataka, the Asian Development Bank and World Bank have funded the implementation other municipalities in the state.

The Alliance's sustained partnership with the State Government of Karnataka has also yielded a proposed landmark policy unprecedented in India. This proposed statewide policy for Municipal Water and Energy Efficiency will oversee the devolution of central financial control, enabling local municipal governments to account for their energy use, pay their own energy bills, and enter into public-private partnerships based on energy service performance contracting models.

In Andhra Pradesh the Alliance was asked by the Andhra Pradesh Urban Services for Poor (APUSP) to implement Watergy in the towns of Vizianagaram and Karimnagar. APUSP is an extensive, statewide program of the British aid agency DFID that encompasses 118 municipal councils. The resulting demonstrations of potential water and energy savings in the two pilot towns were decisive in APUSP's plan to undertake a comprehensive study of water supply systems in 22 other towns. Also as a result of the partnership with APUSP, a *Handbook on Energy Efficiency in Municipal Water Pumping Systems* was developed and distributed to all 118 municipalities in the state. The Vizianagaram Municipal Corporation issued an energy management tender incorporating the energy efficiency specifications as given in the handbook. The Alliance also established and trained an Energy Management Cell at APUSP to serve as a state resource.

The success of the state-wide approach used in Karnataka was replicated in the state of Maharashtra. There the Alliance worked with the Urban Development Department, the Maharashtra Energy Development Agency (MEDA) and the All India Institute of Local Self-Government (AIILSG) to develop a Statewide Road Map for Energy Efficiency in Municipalities. The Alliance coordinated a detailed energy audit of the bulk water supply system in Pune and conducted a training

seminar on energy efficiency best practices for engineers at the Pune Municipal Corporation. Implementation of all proposed short term measures in Pune is underway.

The Alliance has also assisted Vishakapatnam Municipal Corporation (VMC) in Andhra Pradesh, and Delhi Jal Board (DJB), providing them timely technical assistance in making their bulk water supply systems energy efficient. Based on the Watergy concept, DJB has also established its own Energy Management Cell which provides energy efficiency assistance to DJB engineers.

Municipality, State	Annual Energy Savings (kVA & MWh)	Annual Cost Savings (US\$)
Bellary, Karnataka	40 kVA	2,500
Mysore, Karnataka	384 MWh	32,700
Tiptur-Arasikere, Karnataka	110 MWh	10,200
Vishakhapatnam, Andhra Pradesh	150 kVA + 1436 MWh	60,400
Vizianagaram, Andhra Pradesh	920 kVA + 101 MWh	63,700
Karimnagar Municipal Council, Andhra Pradesh	180kVA + 15MWh	16,300
Pune Municipal Corporation, Maharashtra	200kVA + 110MWh	111,465
Delhi Jal Board, Delhi	2159 kVA + 2658 MWh	384,400
Total	3269 kVA + 4689 MWh	553,900

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