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ELECTRICITY FOR WATER PROGRAM



Purpose: to reduce power consumption in the agriculture sector by replacing energy inefficient tubewells with more energy efficient tubewells

Approach: the program will replace up to 11,000 highly inefficient irrigation tubewell pump-motor sets with an equal number of much more energy efficient motor-pump-sets.

Type of pumps: Centrifugal, Turbine, Submersible

Benefits to the farmer:

- 50% subsidy from USAID on the cost of the new pump
- Reduction in electricity consumption by 20 percent

Benefits for the distribution companies: reduction in electricity demand

Program duration: through March 2012

This program is one of the many assistance programs in Pakistan delivered by the U.S. Agency for International Development (USAID) on behalf of the American people.

Background: Pakistan has been going through one of its worst power crises, with a current shortfall of almost 5000 MW. This has led to blackouts that disrupt commerce, industry, and agriculture. As a result, the annual GDP growth has declined from 8 percent to 2 percent. Twenty percent of Pakistan's GDP relies heavily on the sector of agriculture. The country is the world's fourth largest user of ground water for irrigation, in terms of area covered by underground water irrigation. The agriculture sector is the third largest consumer of energy in Pakistan, and tubewell pump sets are a major component of peak demand.

Over the past 30 years, ground water usage in Pakistan has risen exponentially, thereby increasing the burden on Pakistan's electrical demand. Ground water irrigation is done through tubewells. The tubewell pump sets used are generally very inefficient, with operating efficiency at or below 30 percent in many cases. The pump sets are often oversized, which suck water from increasingly declining depths and also to withstand large voltage fluctuations. The energy consumption is high mainly due to:

- Improper selection and installation of the pumps;
- Use of high-friction piping;
- Lack of proper maintenance.

About the program: USAID's Electricity for Water Program is one of six activities under the U.S. Quick Impact Energy Program that Secretary of State Hillary Clinton announced in October 2009 to help alleviate Pakistan's severe power supply shortfall.

This program aims to replace up to 11,000 inefficient tubewell pumps with more energy efficient ones. Each replacement set includes a tubewell pump and a corresponding motor with motor control unit. Replacement will also include coupling, sizing, and installation of the complete pump on a turnkey contract with a prominent high quality Pakistani pump manufacturer. The manufacturer will provide warranty and after sales maintenance and guarantee the energy savings.

Program goal:

- To demonstrate the potential for a significant improvement in the efficiency of the electricity use in Pakistan's agricultural sector, which is the world's largest irrigation-based agricultural system.
- To reduce peak electricity demand of highly subsidized agricultural customers.

Expected results:

- Reduced peak demand for electricity by 45 MW.
- Approximately 115.5 GWh of electricity saved per year.
- Reduced electricity bills of participating farmers by approximately \$7.7 Million per year.
- Accrued about \$3.7 million per year in savings to the seven participating distribution companies from the reduction in sales of subsidized electricity to the farmer.
- Participating farmers will have more reliable pump sets .
- Demonstrated benefits of a reliable energy efficiency improvement program.

Path to sustainability: To help farmers obtain financing for pump replacement, the project has helped determine payback periods that ensure positive monthly cash flow. This will make the tubewell pump replacement program self-sustainable, as replacement will not have to rely on subsidies.