Asia ESCO Conference 2010

Accelerating ESCO Movement in Utility Demand Side Management Programs

Gaurav Bhatiani Principal Energy Specialist, USAID
Rakesh K Goyal Chief of Party, PA Consulting

Panel 1:ESCO Strategies, Policy and Program

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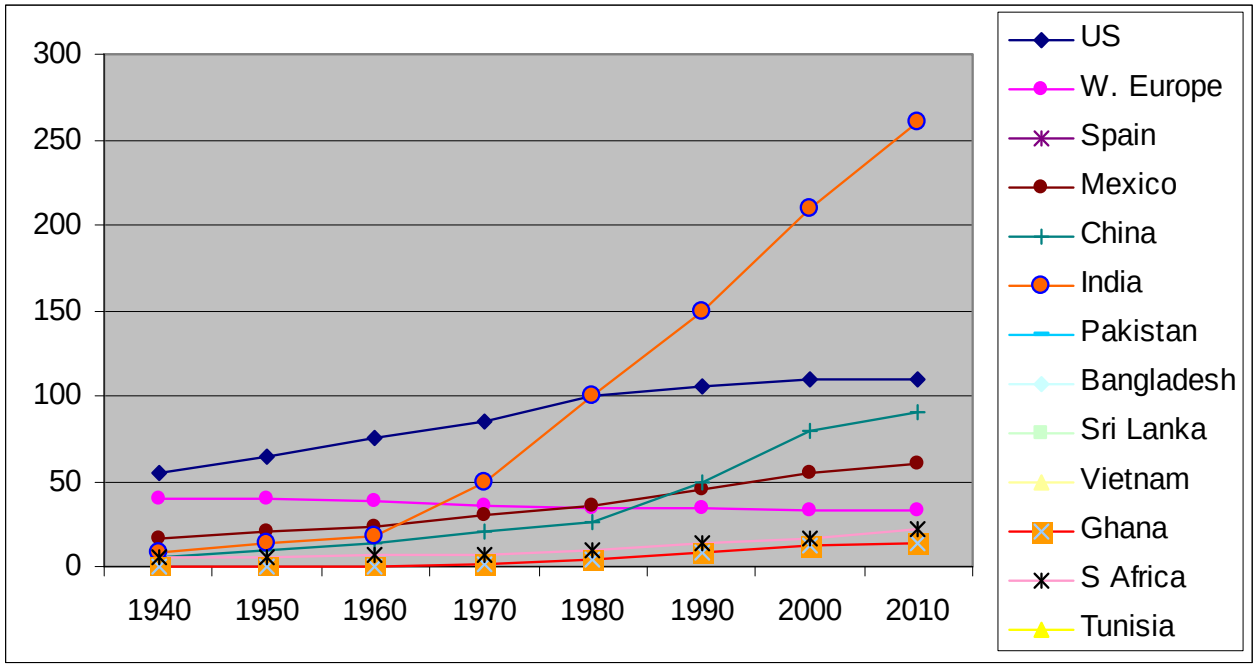
An Emerging Crisis in Water & Power

- 90% of ground water is used in agriculture
- India a topper in ground water use
- There is no water usage policy
- Water rights are passed with the rights of land
- Groundwater levels are falling by 3 - 10 feet/ year



Source: Shah, T, International Water Management Institute, (2005)

Water is a Global Crisis, but the scale of groundwater use in India is **unique**

Importance of Efficiency in Agriculture Sector

Agriculture consumes 23% of power at national level and in many states it accounts for 40% of power.

At national level, agriculture uses 38% of water (90% groundwater)

55 – 60% population dependent on groundwater

- **Financial health of power sector**
- **Availability of water both for irrigation and drinking**
- **Livelihood of farmers**
- **Demand supply gap in power sector**
- **Govt subsidy of Rs. 30,000 Crore per annum**

Power Savings Potential

S.N.	Measures	Potential for Savings
1	Efficient Pumpset	25-40%
2	Suction Pipe & Foot Valve	5-15%
3	Efficient Irrigation Methods	15-25%
4	Total Saving Potential	45-80%

ESCO Based Solution Demonstrated

First Ever ESCO deal in Agricultural Demand Side Management on a performance contract basis

Public-Private Partnership with a 10 year agreement

Project Name	Water Energy Nexus (WENEXA)
Supported By	USAID
Implemented by	PA Consulting
DISCOM	Bangalore Electricity Supply Company (BESCOM)
ESCO Selected	Enzen Global Solutions, Bangalore
Project Site	Doddabalapur, 60 KM from Bangalore city

ESCO Based Solution Demonstrated

First Ever ESCO deal in Agricultural Demand Side Management on a performance contract basis

Public-Private Partnership with a 10 year agreement

Location:	**Doddaballapur (BESCOM)**
Geographical area	**11,000 acres**
No. of villages/population	**29/17,000**
% net sown area	**75%**
% irrigated area	**16%**
Major crops	**Mulberry & grapes**
Depth to ground water	**200-400 ft**
No. of feeders/pumpsets	**4/700**
Typical pumpset capacity	**5-10 HP**

Innovation Developed

- Farmers - get NHEP, after-sales services, good quality power & required amount of water
- Utility – energy savings with greater opportunity cost 46%
- ESCO – profit from saving energy, payback in three years

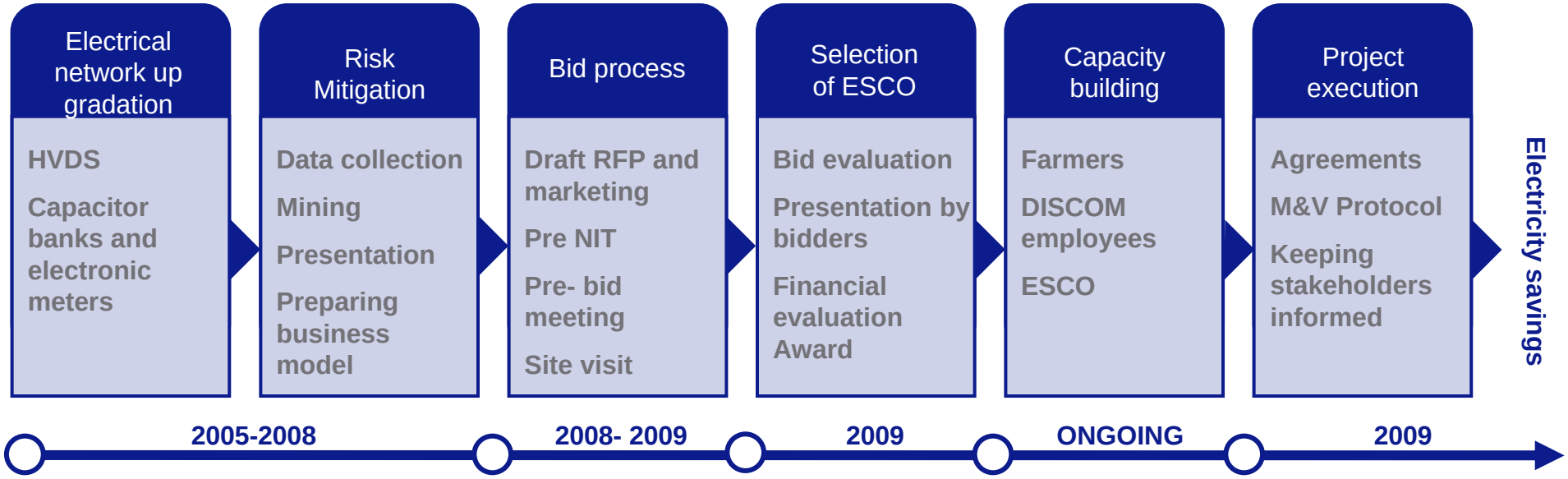
- Project based on commercial principles
- Long term horizon – no ‘snap back’ effect
- Project risks shared among stakeholders and ESCO

- Rules of public procurement followed
- Active engagement of all stakeholders
- Extensive groundwork – studies, information – reduce perceived project risks

Solution Demonstrated: Key Features

- **BESCOM provided all the preconditions for the project**
  - **HVDS installed.**
  - **One Distribution Transformer for each pump.**
  - **Meters on all Distribution transformer**
  - **NGO working and educating farmers for four years**
  - **Detailed data available on pumps and pump efficiency**
  - **BESCOM obtained in principle agreement from KERC & the Government of Karnataka to proceed on a pilot program**
- **Farmers get a new branded energy efficient pumpset free with a 18 month warranty.**
- **ESCO to implement the pumpset replacement as a part of the Ag DSM program**
  - **ESCO finances the investment required**
  - **Provides ongoing O&M support to farmers and establishes a site office**
- **ESCO recoups investments through sharing of the energy served**

The Process Followed



Network Upgradation: HVDS and Metering

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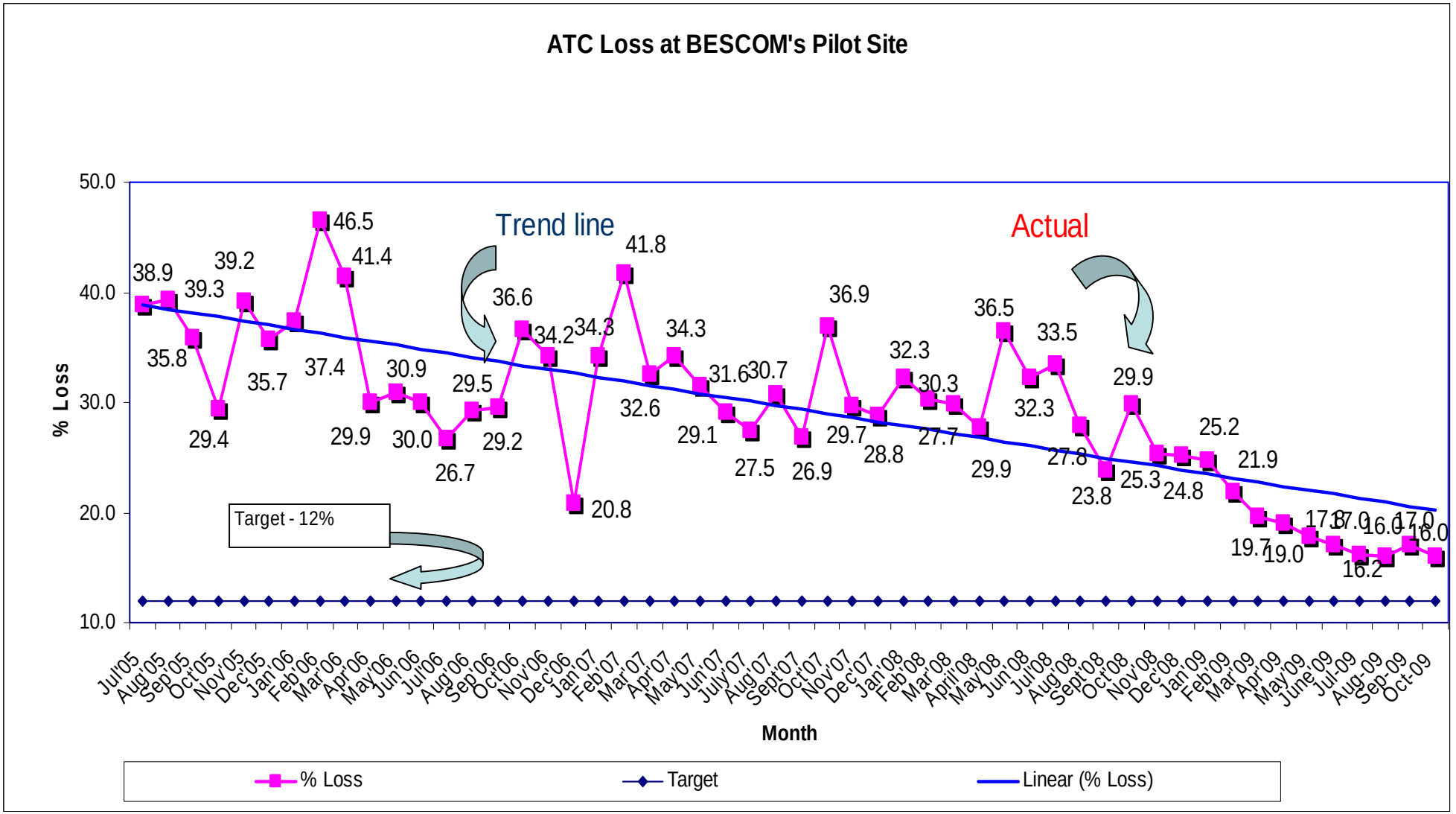

Risk Mitigation:

Contents of the RFP

Volume –I

- RFP Document
- Draft Agreement between BESCOM and ESCO
- Draft Agreement between ESCO and Farmer

- Volume-II (on CD)
  - Annex. A to H- regarding site study about feeders, land, irrigation, pump etc carried out by various agencies.

Annexure A: Concept Note on Agricultural DSM (June, 2007)
Annexure B: Financing Agricultural DSM Projects. (Aug, 2008)
Annexure C: Map of Feeders 12 & 13 in project area (200a6)
Annexure D: Land use maps for Feeders 12 & 13 in in the project area (July 2008)
Annexure E: Pumpset Survey for Feeders 12 & 13 in the project area (Updated 2008)
Annexure F: Water Balance Study in parts of Doddaballapura Taluk, (October 2008)
Annexure G: DPR: Irrigation Efficiency Improvements Feeder 12 and 13 (2006)
Annexure H: Farmers' Education in Doddabballapura (2004-2008)

The Bid Process: Pre-Bid Meeting

The Bid Process: Site Visit

Selection: Technical & Financial Criteria

Technical Criteria	Maximum Points
Understanding of the Problem & Technical Approach	30
Proposed Organization, Staffing and prior experience related to the project	50
Innovation & other factors	15
Usage of (BEE) Star-rated pumpsets	05

Applicant with a score of 70 or more shall be declared as technically qualified.

Financial Criteria	
Energy Saving in the project with reference to the base line (in %)	X (say)
Proportion of Energy saving proposed to be shared with BESCOM (in %)	Y (say)
Bidding Parameter (in %)	X*Y

Applicant proposing the highest value of bidding parameter shall be the finalist ESCO

Project Execution: Contracts

Obligations of BESCOM

- BESCOM shall be responsible for efficient and reliable operation, maintenance and repair/replacement of power supply system
- BESCOM had implemented HVDS with one transformer for one pump.
- Each pump to have a separate meter physically located on the Distribution Transformer (DT).
- BESCOM has installed switched capacitors on 11 KV systems.
- BESCOM will make payments on a monthly basis to the ESCO based on the share of energy savings derived from the competitive bidding process.
- Seek GOK support for implementation of proposed project; keep KERC informed and seek necessary KERC approvals, if any.
- BESCOM will be obliged to provide the necessary hours of supply to the Feeders as per policy of GOK.

Project Execution: Contracts

Obligations of ESCO

Financing and implementing the new energy efficient pumpsets

Planning the New High Efficiency Pump (NHEP) procurement, installation, maintenance an repair/replacement during the contract.

Dismantling the old pumps and ensuring its disposal in a manner that it can not be used as irrigation pumpset anywhere in India.

For maintaining a log of easily visible serial numbers and markings in the casting on the products. (For purposes of record and scrutiny against tampering of the IP set.)

Joint Obligations of BESCOM and ESCO

Agreements to be signed between ESCO & BESCOM.

BESCOM to facilitate signing of agreement between ESCO & farmers.

ESCO, jointly with BESCOM, to implement a monitoring and verification (M&V) protocol for meter reading.

Capacity Building

More than 4,400 participant days of training/capacity building was delivered

Responsiveness and Impact

- **Interest of various stakeholders:**
  - **State governments – Government of Karnataka**
  - **Regulatory commissions – Karnataka, Haryana and others**
  - **Utilities – BESCOM, UHBVNL and others**
- **Long term contract signed between ESCO and BESCOM**
- **Impact – energy savings: 46% of the baseline consumption**

Sustainability –Way Forward

1. Continuous Awareness generation and capacity building of farmers.
2. Enhance Water Efficiency
   - Adoption of micro irrigation technologies
   - Improving cultivation practices
   - Changing/adapting cropping patterns by farmers
   - Water Conservation and Management
3. Capacity building of ESCO
4. Regulatory Incentives for DSM in Irrigation Pumping
5. Institutionalization through various Institutions (NABARD, Agricultural University)

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Project Partners

PA Consulting Group

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UNIVERSITY OF AGRICULTURAL SCIENCES
Gandhi Krishi Vignyan Kendra Bangalore - 560 065, Karnataka, INDIA

Public Recognition

Thank you