Energy Efficiency
in
Textile SMEs Clusters
(BEE SME Programme)

Pawan Kumar Tiwari
Advisor (SME)
Bureau of Energy Efficiency
(Ministry of Power, Government of India)

New Delhi, India
17th July, 2010

About
Bureau of Energy Efficiency

Bureau of Energy Efficiency

- BEE is a multi disciplinary body formed under the Energy Conservation Act 2001.
- To provide a legal framework for the government's energy efficiency initiatives in the country.
- Mission is to develop policies and strategies with a thrust on self regulation and market principles with the primary objective of reducing energy intensity of the Indian economy.

Functions of BEE

- Develop and recommend the norms for processes and energy consumption standards.
- Develop and recommend the minimum energy consumption standards and labeling design for equipment and appliances.
- Develop and recommend the specific energy conservation building codes.
- Recommend the Central Government for notifying any user or class of users of energy as a designated consumer.
- Take necessary measures to create awareness and disseminate information for efficient use of energy and its conservation.

BEE's Program for SMEs

About SMEs

- About 26 million units in India
- Providing employment to about 60 million people
- Contributing to about 45% of manufacturing output
- Share of export is about 40%
- Contribution to GDP is 8-9%
- Manufacturing more than 1000 products

Objectives

- To reduce the energy intensity of the Indian economy by undertaking "Energy Efficiency" initiatives in the SME sector

- to accelerate the adoption of EE technologies and practices in selected clusters in the SME sector through
  - knowledge sharing,
  - capacity building and
  - development of innovative financing mechanisms

Approach

- Improving Knowledge Base of all stake holders
- Cluster Approach: about 75% units are in clusters
- Market Development: EE product/ technologies
- Financial Support: bankable DPRs, tie-up with FIs, soft loans, subsidies
- Pooling Resources: synergy with MoMSME, SIDBI, UNIDO, WB, ECCJ, JICA

Program Activities

- **Current Energy use and technology analysis**
  - **Situation analysis in 35 SME clusters to understand the ground situation such as technology, energy consumption, etc in the cluster**
  - **Energy use and technology audit to understand the energy productivity**

Outcomes are/would be information on energy usage in cluster manuals, best practices, etc

Program Activities (contd....)

- **Capacity building**
  - **Introductory workshop to share the outcome of above activity**
  - **Information dissemination workshops in the clusters**

Outcomes would be identification of LSPs and for finalisation technologies for DPR preparation

Program Activities (contd....)

- **Implementation of energy efficient measures**
  - **Preparation of 15 bankable DPRs per cluster on the identified technologies (total 375 DPRs under the program)**
  - **Capacity building of local services providers (LSPs) to implement EE projects**

Outcomes would be more than 425 DPRs, on energy efficient and sustainable technologies and identification of LSPs project wise, Capacity Building of LSPs, etc

Program Activities (contd....)

- **Facilitation of innovating financing schemes**
  - **Facilitation of financing EE projects**
  - **Capacity Building of banks to evaluate EE projects**
  - **Conducting local services providers (LSPs) Workshop**

Outcomes would be financial schemes with leading financing institutions to fund EE projects, capacity building of bankers, project impact and future roadmap

Identified Clusters

- Ahmadabad (Chemicals),
- Alwar (Oil Mills),
- Bangalore (Machine Tools),
- Batala, Jalandhar,
- Ludhiana (Foundries),
- Bhimavaram (Ice Making),
- Bhubaneswar (Brass),
- E&W Godavari (Refractories),
- Ganjam (Rice Milling),
- Gujarat (Dairy),
- Howrah (Galvanizing),
- Jagadhari (Brass& Aluminum Utensils),
- Jamnagar (Brass),
- Jodhpur (Lime Kilns),
- Jorhat (Tea),
- Kochi(Sea Food processing),
- Morbi (Ceramics),
- Muzaffarnagar (Paper),
- Orissa (Sponge Iron),
- Pali (Textiles),
- Sholapur (Textiles),
- Surat (Textiles),
- Tirupur (Textiles),
- Varanasi (Bricks),
- Vellore (Rice Milling), Warangal (Rice Milling),
- All India Brick Cluster

Solapur Textile Clusters

- There are about 600 Textile industries
- 350 units are of integrated type
- 250 units are having only weaving facility i.e., power looms.
- 250 units in the cluster have manual dyeing (i.e chulhas)
- 100 units has mechanical dyeing facility (Boiler/Thermic Fluid Heaters)
- Energy use and Technology audit studies conducted in 51 units.
- Technology audit conducted in 51 units

Annual Energy Consumption of the cluster is estimated to 16.647 kTOE

Energy Conservation Opportunity

- **Replace inefficient Boilers and Thermo packs with Hot Water Generator**

  - Energy Saving Potential 62%
  - Monetary Saving Potential 1.68 (Rs. In Lakhs)
  - Initial Investment (100000 kcal/hr) 2.20 (Rs. In Lakhs)
  - Payback Period 16 (Months)
  - Reduces wood consumption and electricity consumption
  - Reduces GHG emissions
  - Compact, easy to operate and low operation and maintenance costs
  - Maximum utilization of heat due to improved design aspects

Energy Conservation Opportunity

- **Installation of Economizer/APH in boilers and thermic fluid heaters**
  - Energy Saving Potential 12%
  - Monetary Saving Potential 0.42 (Rs. In Lakhs)
  - Initial Investment 0.75 (Rs. In Lakhs)
  - Payback Period 21 (Months)
  - Subsidy under various governmental schemes
  - Increases production for the same period
  - No operation and maintenance costs

Energy Conservation Opportunity

- **Installation of Variable Frequency Drives in process & utility sections**
- **Oil – Circulation Pump**
  - Energy Saving Potential 20%
  - Monetary Saving Potential 0.24 (Rs. In Lakhs)
  - Initial Investment 0.30 (Rs. In Lakhs)
- **Doubling Machine**
  - Energy Saving Potential 12-16%
  - Monetary Saving Potential 0.12 (Rs. In Lakhs)
  - Initial Investment 0.25 (Rs. In Lakhs)

Energy Conservation Opportunity

- **Replacement of shuttle looms with Auto Looms**
  - Monetary Saving Potential 1.2 (Rs. In Lakhs)
  - Initial Investment 5.0 (Rs. In Lakhs)
  - Reduced labour cost due to higher allocation of looms and productivity.
  - Defect free cloth for longer length.
  - Better environment due to low noise level.
  - Easily adaptable for market trends.
  - Easy maintenance and less work load for Jobbers.
  - Lesser accidents

Energy Conservation Opportunity

- **Other opportunity**
  - Solar hot water system
  - Replacement of single pass tube fired boiler with multi-pass energy efficient boiler
  - Use of energy efficient improved chulhas .....
  - Solar Drying Systems

Overall energy saving potential of the cluster is estimated to 4.46 kTOE which is 26 % of the total energy consumption of the cluster

Surat Textile Clusters

- There are about 400 Textile industries in the cluster
- 70 units are having only dyeing facility
- 330 units are of integrated type having both dyeing and printing facilities
- The Energy use and Technology audit studies has been completed in 75 units

Annual Energy Consumption of the cluster is estimated to 1289 kTOE

Energy Conservation Opportunity

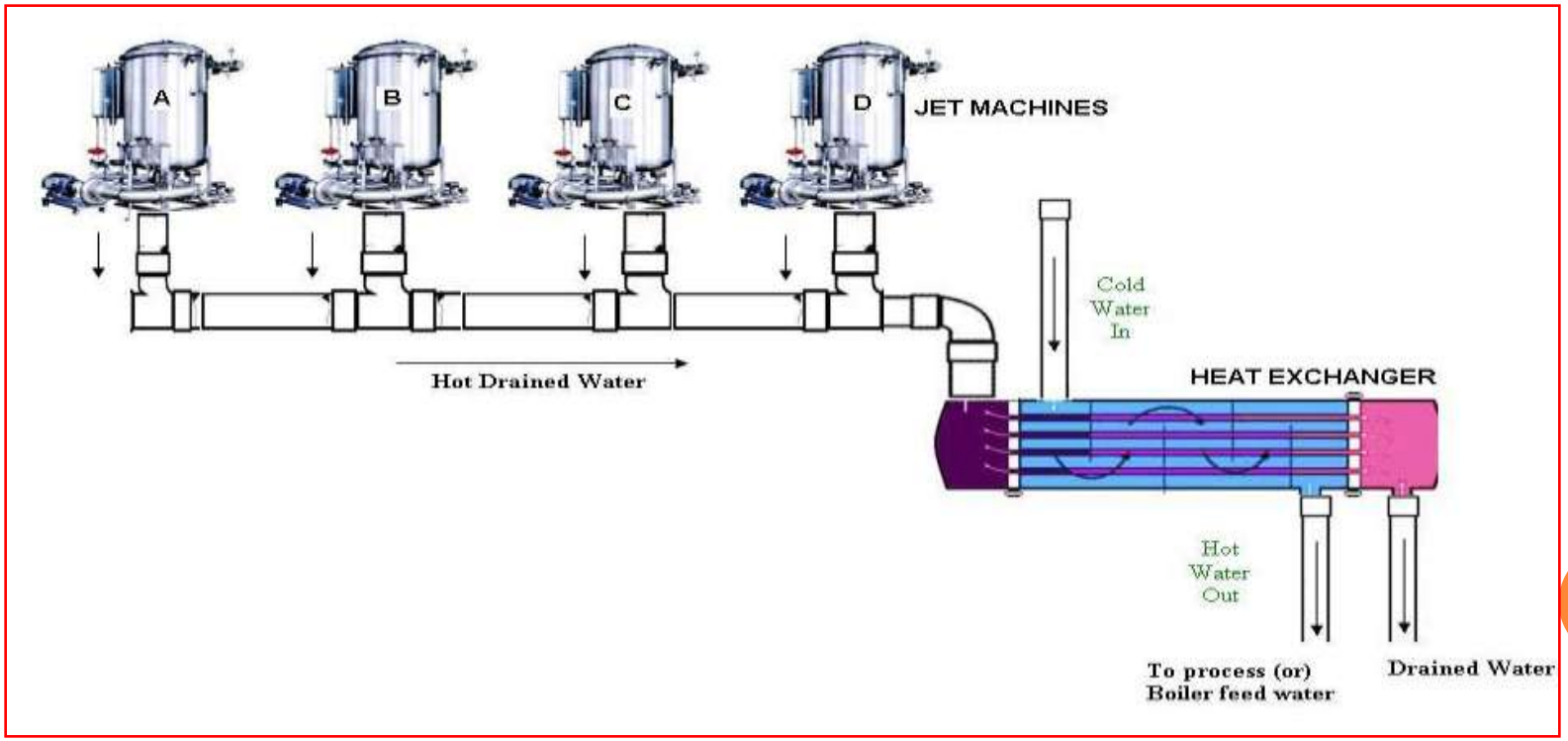
- **Natural gas generator with cogeneration**
  - Monetary Saving Potential 27.8 (Rs. In Lakhs)
  - Initial Investment 100.0 (Rs. In Lakhs)
  - Cogeneration is a low cost future source of power for meeting the in-plant requirements of steam and power
  - Augments supply of power in a regime of endemic shortages in the power sector
  - Promotes energy conversion efficiency and thereby conserves scarce fossil fuels
  - Ensures reliable, continuous delivery of cost effective power and reduces dependence on fossil fuels

Energy Conservation Opportunity

- **Tri-generation Micro Turbine - Energy Conservation Turbine**
  - Monetary Saving Potential 26.39 (Rs. In Lakhs)
  - Initial Investment 40.0 (Rs. In Lakhs)
  - Proven GHG reduction potential
  - Huge untapped potential for energy conservation
  - Pay back period is 6 – 18 month only
  - High Utilization Factor (about 80 – 95%) equals best "bang-for-buck" compared to other Clean-Tech investments
  - Island foundation is not required, there by saving substantially on installation cost.

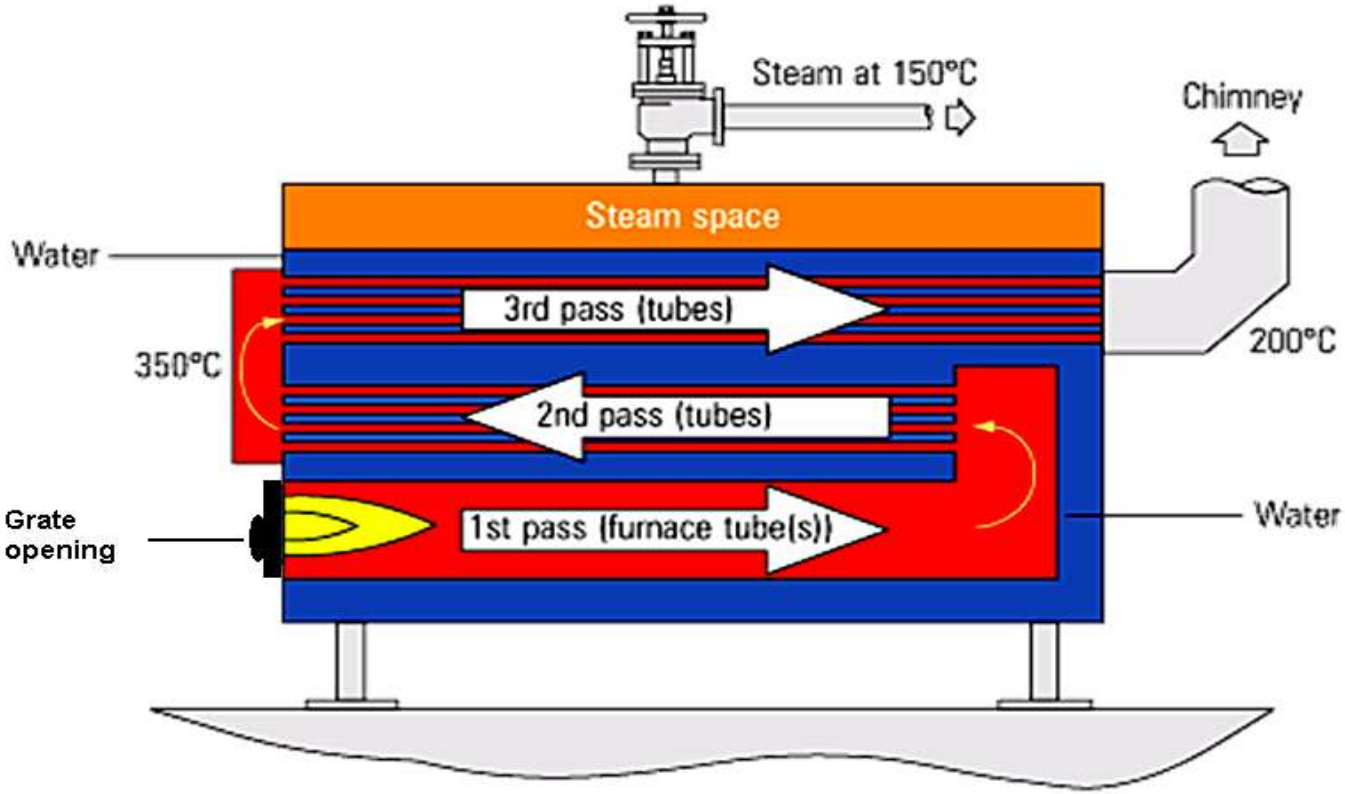
Energy Conservation Opportunity

- **Generate hot water from hot drained water of Jet Machines**
  - Monetary Saving Potential 10.2 (Rs. In Lakhs)
  - Initial Investment 6.0 (Rs. In Lakhs)



Energy Conservation Opportunity

- **Energy Efficient Boilers**
  - Monetary Saving Potential 33.0 (Rs. In Lakhs)
  - Initial Investment 30.0 (Rs. In Lakhs)



Energy Conservation Opportunity

- **Installation of Variable Frequency Drives in process & utility sections**
- **VFD's for jet machines**
  - Monetary Saving Potential 0.56 (Rs. In Lakhs)
  - Initial Investment 0.65 (Rs. In Lakhs)
- **Install VFD's for stenter machines fans**
  - Monetary Saving Potential 0.35 (Rs. In Lakhs)
  - Initial Investment 0.40 (Rs. In Lakhs)

Energy Conservation Opportunity

- **Other opportunity**
  - Solar system for pre-heating of feed water
  - Energy Efficient Pumps
  - Energy Efficient Motors (EFF1)
  - Online flue gas monitoring system & Integration with FD fan
  - Pressure Powered Pumping Packaged Unit (PPPPU) for improving condensate recovery
  - Auto – washing Machine
  - Auto – Printing Machine

Overall energy saving potential of the cluster is estimated to 150 kTOE which is 13 % of the total energy consumption of the cluster

PARTNERS

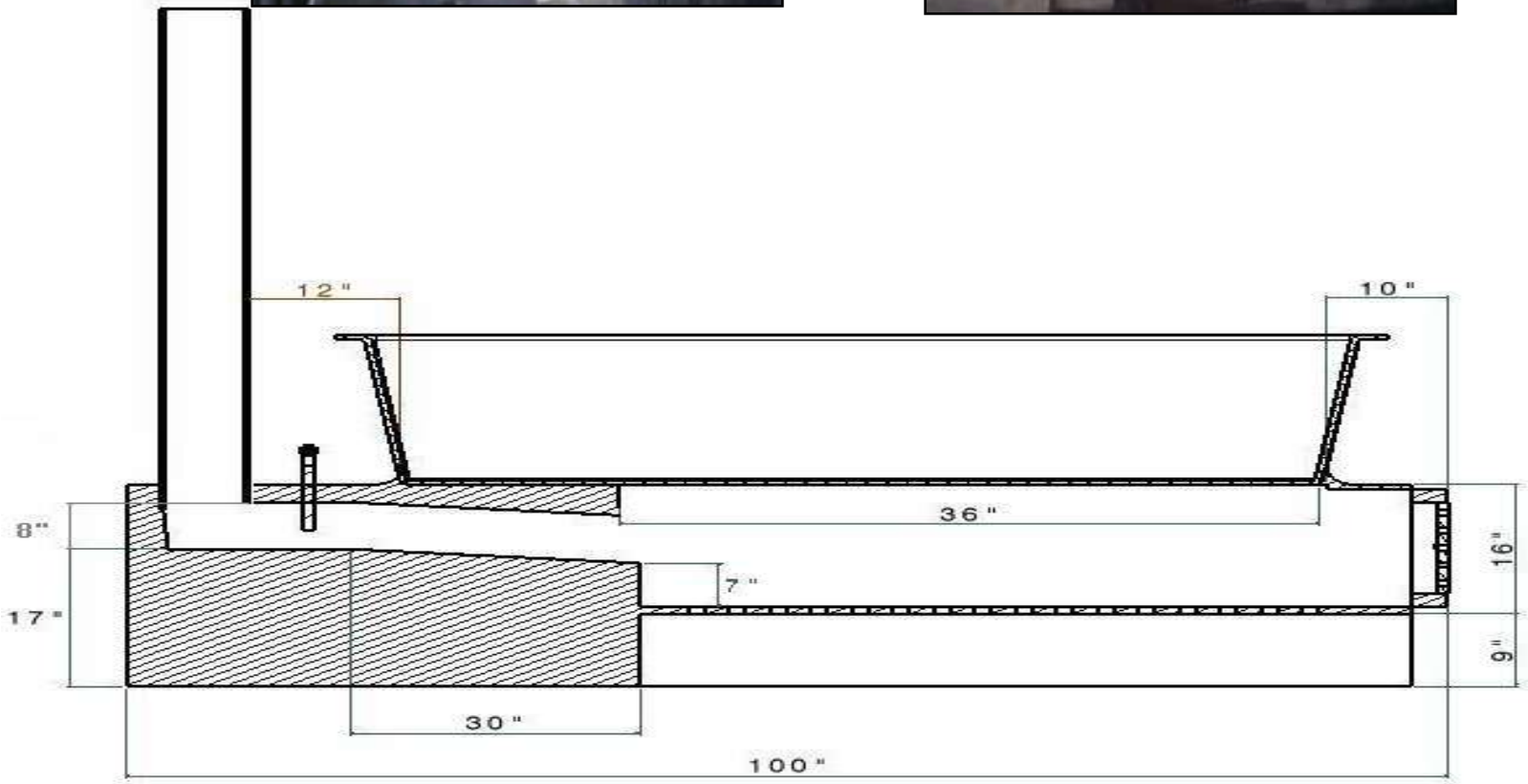
- **MoMSME – 25 clusters selected in consultation with MoMSME, capitalization of DPRs by MoMSME**
- **SIDBI – MoU signed (Energy Efficiency Financing Platform) with focus on SMEs – SIDBI expertise in training of BEE's Executing Agencies for preparing bankable DPRs and peer review of DPRs**
- **UNIDO – 12 clusters selected, dovetailing from DPR preparation stage**
- **WB – 5 clusters under GEF project, to be implemented jointly by BEE & SIDBI. Assistance for creating Risk Mitigating measures for Financing of EE Projects**
- **ECCJ – to support the small group activities in the SMEs**

KNOWLEDGE/INFORMATION BANK

- BEE has taken the initiative to bring all the stakeholder agencies working in SMEs on one platform to exchange their experiences & synergize
- BEE-TERI –SDC established a secretariat to manage the database bank on energy efficiency project in SMEs
- A knowledge web-portal for information dissemination about the energy intervention programs in SMEs

Energy is Life
Conserve It
Thank you !

www.bee-india.nic.in


12 "
10 "
36 "
8"
7 "
17 "
16"
9"
30 "
100 "