Regional Energy Efficiency Center for Small and Medium Enterprises

SEE-Tech Solutions Pvt. Ltd.

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Background

Growth of all segments of manufacturing and services enterprises – be they micro, small, medium or large – is critical for economic development and creation of jobs. India has currently 26 million Micro, Small and Medium Enterprises (MSMEs) as per the report of Prime Minister's Task Force on MSME (January 2010). This sector contributes 8 percent of the country's GDP, 45 percent of the manufactured output and 40 percent of its exports.

Despite recent reductions in overall energy intensity in India, the SME sector has fallen behind larger Indian industry achievements in terms of energy efficiency. In this context, the Bureau of Energy Efficiency is laying greater emphasis on the SMEs and has initiated a major program for energy efficiency improvement in several energy intensive SME clusters. SMEs are facing high and rising energy costs, and are also exposed to global competition; the price and cost pressures are areas of concern. SMEs, especially those for whom energy costs represent a large portion of total production costs, can reap high direct economic benefits by improving energy efficiency. However, numerous barriers have prevented widespread adoption of energy efficient techniques and technologies in the sector. Key impediments for implementation of such energy conservation measures in SMEs include the following:

- Lack of technical skills and scientific approach to monitor energy performance of equipment and facilities
- Lack of managerial capacity to take up energy conservation and to perceive cost effective projects
- Low credibility of service providers such as energy consultants, and dearth of champions in the industry
- Lack of opportunities to see energy efficiency practices and technologies adopted in real situations

Today's Situation

- Large number of SME units in the country are in clusters in various parts of the country
- Large potential for implementation of energy efficiency and renewable energy projects
- Service providers to SMEs have low advisory calibre
- SME perception "I will not be behind, but let me see first". "Seeing is Believing" prevails
- Clear need for visual demonstration to accept the adoption of efficient technologies

Keeping in view the above impediments, prevailing situation and the programmes and initiatives of Bureau of Energy Efficiency, USAID through its ECO-III Project is supporting the establishment of Regional Energy Efficiency Centre (REEC) for SMEs at SEE Tech Solutions, Nagpur. The immediate focus of REEC is on SMEs which have industrial furnaces as major energy consuming equipment.

REEC Objectives

- Build capacity of practicing energy consultants and plant personnel from SMEs by providing training on energy efficiency, showcasing pilot/lab scale demonstration models and software tools
- Develop trained professionals who actively provide services to SMEs
- Popularize substitution of expensive fossil fuels by cheaper agro-based fuels in furnaces, wherever feasible
- Serve as a platform for sharing information on best practices amongst SMEs
- Baseline and Benchmark various metallurgical sectors in SMEs such as re-rolling, forging, foundries, etc. for energy consumption and carbon dioxide emissions

Demonstration Models and Equipment

USAID is supporting REEC by financing the following lab scale demonstration models and equipment, which will be utilized for training and awareness programs for SMEs:

1. Gasifier for
   - Agro based fuels
   - Coal
2. Two melting furnaces
   - Conventional design
   - Energy efficient design
3. Two heat treatment furnaces
   - Conventional design
   - Energy efficient design
4. Heat recovery system (recuperator) for heat treatment furnace
5. Oxygen monitoring system for furnaces
6. Variable frequency drive/variable speed drive for force draft fan in the furnace
7. On-line furnace monitoring and automation system
8. Infrared thermal scanning system for furnaces
9. Analytical lab equipment
10. Material handling and personnel safety equipment

Techniques and Technology Demonstration

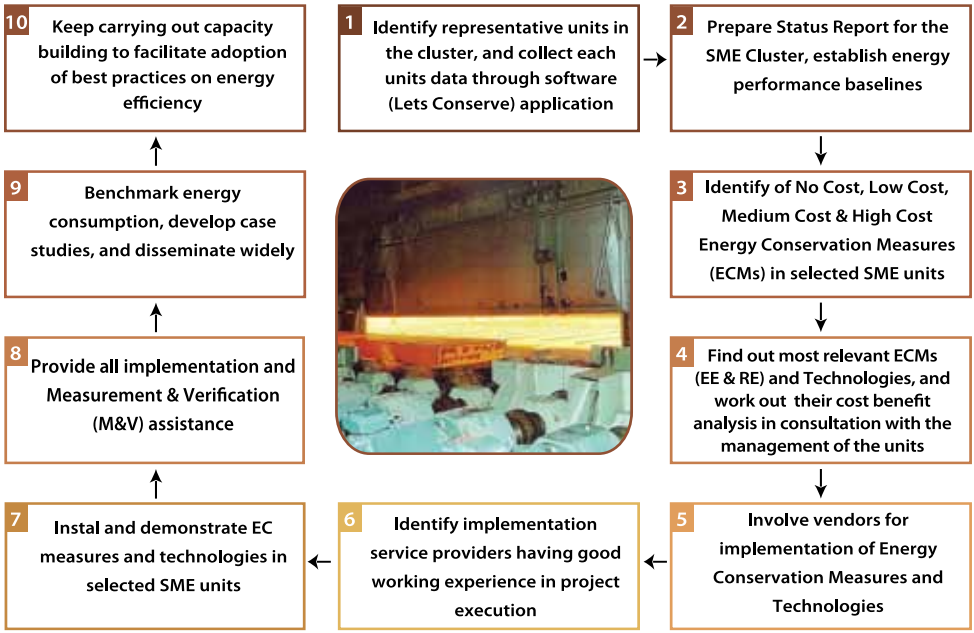
Demonstration of following energy savings techniques and technologies are being targeted, as a long-term strategy for REEC:

- Fuel savings in heat treatment and non-ferrous melting furnaces with recuperator
- Fuel savings with use of low thermal mass refractory in furnaces
- Fuel savings with excess air optimization
- Effect of bad and good insulation in furnaces on fuel consumption
- Fuel savings by minimizing air infiltration in furnaces

- Fuel savings by improving furnace loading and optimization of furnace operation
- Reduction in radiation heat loss from furnace surface by using low emissivity paint
- Increasing radiation heat transfer inside the furnace by using high emissivity coating
- Effect of stock preheating by flue gases on fuel consumption in melting furnace
- Fuel savings by oxygen enrichment of combustion air in furnace
- Operation of efficient coal/gas/oil fired melting furnace
- Fuel substitution by producer gas in melting furnace
- Fuel savings by using low mass tray/trolley in furnaces
- Hot water generation through waste heat recovery
- Use of Down draft rice husk gasifier for non-ferrous melting furnace
- Use of biogas for thermal applications
- Fuel savings by installing regenerative burners

The Roadmap - Cluster Approach

Following steps are envisaged by REEC for promoting implementation of energy efficiency projects in SME Clusters:



REEC Targets

- Develop technical documents such as best practice booklets/guides, case studies, etc., and disseminate these through public domain, awareness events, training programs, etc.
- Accelerate energy conservation in SMEs through demonstration based adoption of energy efficiency and renewable energy technologies
- Institutionalize and implement a program covering 100 energy intensive SMEs in next three years and monitor energy savings and corresponding carbon dioxide reduction
- Provide platform for development and deployment of new and efficient technologies, and facilitate specific programs for their commercialization

Current Status of REEC

- Diagnostic equipment, coal/agro-based gasifier, and model demonstration furnaces have been procured. Efforts are going on to complete the installation and commissioning work
- Conducting series of training programs utilizing live demonstration of furnace facilities coupled with on-line computer based provisions for highlighting energy efficiency concepts and technologies
- Developing best practice guides for two SMEs Furnaces (Forging and Heat Treatment)
- With support from Bureau of Energy Efficiency under SME Cluster Program, has undertaken number of activities which include demonstration and monitoring of energy savings in ceramic cluster, capacity building of local service providers, preparation of detailed project reports to facilitate financing of projects for implementation. Similar work is scheduled for brass making cluster
- With support from Energy Efficiency Services Limited, See Tech plans to undertake a study on one or two SMEs clusters in the State of Chhattisgarh and identify various financial schemes for SMEs for implementation of energy efficiency projects

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