



A platform for learning and action for small and micro enterprises

Editorial

Although SMEs play a vital role in the growth of the Indian economy, there is still large potential for improvement in their energy performance. To boost the energy efficiency of this sector, the Bureau of Energy Efficiency (BEE) is implementing a program in 25 SME clusters across the country. The objective of the program is to accelerate the adoption of energy efficient technologies and practices in the chosen SME clusters through knowledge sharing, capacity building and development of innovative financing mechanisms. This program adopts a cluster-based approach because of the similarity in characteristics among SME units within a cluster like geographical location, markets, products manufactured, technology, development issues and common pool of resources.

The major activities identified under the BEE program include (1) analyses of current energy use and technologies by carrying out energy audits to understand the ground situation, (2) capacity building to share information on best practices and the outcome of the above analyses with the larger stakeholder group, (3) implementation of energy efficient measures by identifying suitable technologies having large potential for energy saving in each cluster, and preparing bankable detailed project reports (DPRs) on the identified technologies, and (4) facilitation of innovative financing schemes for the identified energy efficient technologies. To facilitate smooth financing, capacity building of bankers is also planned under this program.

Work has already started in all the identified 25 clusters, and energy audits have been completed in a few clusters. Many energy saving measures have been identified, and many low or no-cost interventions are already being implemented and yielding handsome returns to SME owners. Interventions which require large capital investment for change of technologies or processes are being identified for converting them into bankable DPRs. It is expected that an SME owner can approach the bank with such a DPR, along with unit-specific financial information, and obtain a loan.

There is synergy between this BEE program and other energy efficiency improvement programs being undertaken by agencies such as SIDBI, Ministry of MSME, Global Environment Facility (GEF)/ World Bank/ UNIDO, etc. An MoU has already been signed with SIDBI to provide subsidized finance for implementation of energy efficiency technologies as identified in the DPRs. On similar lines, the Ministry of MSME has agreed in principle to capitalize on the DPRs prepared under the BEE program.

The World Bank is implementing an energy efficiency improvement program in five identified clusters with BEE under the GEF-funded Programmatic Framework Project on Energy Efficiency in India. The activities will lead to larger penetration of energy efficient technologies and skill enhancement of various stakeholders in the clusters. UNIDO has also started a program with BEE to improve the energy efficiencies in 12 identified clusters by facilitating adoption of energy efficient and renewable energy technologies.

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UNDP-GEF brick project inception workshop organized

TERI organized the inception workshop of the project titled 'Energy efficiency improvements in Indian brick industry' in New Delhi on 20th November 2009. The participants of the workshop included brick entrepreneurs from across the country; builders, architects and academicians; manufacturers of brick machinery; and representatives from UNDP, SDC, MoEF, PSCST (Punjab State Council for Science and Technology), NIIST (National Institute for Interdisciplinary Science and Technology), CGCRI (Central Glass and Ceramic Research Institute), CPWD, and the Corps of Engineers, MES (Military Engineering Service). As reported earlier (see Editorial, *Cosmile Update* 4(3), September 2009), this project is being supported by UNDP and GEF.

The major objectives of the project are to enhance public awareness on REBs (resource-efficient bricks); facilitate access to finance for brick kiln entrepreneurs; improve knowledge related to technology and marketing; demonstrate and make available technologies and models for producing REBs; and build the capacities of stakeholders. TERI is the 'Implementing Partner' for project activities and MoEF is the executing agency. Local Resources Centres (LRCs) are being set up by TERI in different regions of the country to facilitate effective implementation of the project activities.

The workshop comprised an inaugural session followed by two technical sessions. Each session witnessed active involvement of the participants. The participants were also shown a video on the use of REBs in different construction applications. Mr R R Rashmi, Joint Secretary, MoEF, emphasized the importance of the project in reducing clay consumption by brick units (thereby conserving topsoil), and in making the Indian brick industry competitive with global standards in terms of product quality, energy and environmental performance. Mr Pieter Bult, Deputy Country Director,

UNDP, placed the project in the context of global climate change concerns, noting that it marks another important initiative by India towards reducing CO₂ emissions from the country. Mr N Vasudevan, Fellow, TERI, explained that it has become imperative for small-scale brick kiln entrepreneurs in India to switch over from making traditional 'solid' bricks to REBs in the face of ever-increasing concerns about topsoil depletion and air pollution coupled with non-availability of skilled workers. TERI will enable entrepreneurs to obtain technology for making REBs; facilitate their access to finance for new/improved technologies; and build capacities of entrepreneurs, service providers and other stakeholders to help ensure a growing market for REBs in the country.

Dr Neelima Jeyrath, Executive Director, PSCST, described the vital role PSCST has played in promoting improved technology and operating practices among the brick industry. She elaborated on the major challenges that the project must tackle, including semi-mechanization in a traditionally labour-intensive industry; introduction of new products in a conservative industry and market; low levels of innovation; and limited knowledge-sharing among stakeholders. She further stressed the key role of LRCs in overcoming different barriers. Mr Rudy Van Reeth, Managing Director, Wienerberger India (which has an REB plant at Kunigal, near Bengaluru) briefly described different kinds of REB products, and how they compare with traditional solid bricks in terms of their characteristics and applications.

Dr KG K Warriar, Deputy Director and Head, Materials and Minerals Division, NIIST, described the importance of soil characteristics in determining firing temperatures, and the need to choose the right kind of soil in order to reduce energy costs. He also spoke on simple and low cost equipment with which units themselves could test soil and end-products and incorporate necessary changes. He mentioned the QC (Quality Control) laboratories set up by NIIST for the brick and tile industry in Kerala – Baliapattom Tile Works, Kannur and KAP India Tiles, Thrissur – and voiced the need for more such

labs across the country. He also spoke on the possibility of developing value-added products (e.g. glazed terracotta tiles).

Mr K K Vijayan of Vijaya Prakash Industries, Kozhikode (a manufacturer of machineries for the brick and tile industry) described the benefits of semi-mechanization in making value-added REBs. Mr K S Chetan, architect with Jaisim Fountainhead, Bengaluru (a leading design firm specializing in the use of REBs in 'green' architecture) described how hollow clay blocks can be used in a variety of ways for constructing columns, roofs, walls, window frames and floors. Two brick kiln entrepreneurs, Mr Sanjay Dadoo (from Uttar Pradesh) and Mr Thomas (from Kerala), shared their experiences in making REBs. Mr Rudy (Wienerberger India) elaborated on issues that need to be tackled in popularizing REBs in the market. He also described methods by which the impact of topsoil extraction can be reduced.

Winding up the event, Mr Pritpal Singh of PSCST recalled a prediction made in 2001 by Mr Pierre Jaboyedoff of Sorane SA, Switzerland that by the year 2010 mechanization of the Indian brick industry

would commence, and that by the year 2050 it would be complete. He remarked that in the light of recent trends and developments in the industry, this prediction might well come true.

Web portal launched for promoting business development services for MSMEs

TERI has set up a dynamic web portal, <http://www.chandigarhbds.com>, for supporting the activities of the MSME units in the Mohali-Panchkula-Chandigarh engineering cluster (also known as 'tricity' cluster) under a project supported by SIDBI. The web portal was formally launched on 19th November 2009 by Dr Gunmala Suri, Reader-UBS (University Business School), Punjab University and Member of the Cluster Coordination Committee set up under the project.

The web portal provides a platform to identify, establish, and support links between the BDS (Business Development Services) providers and engineering enterprises in the tricity cluster. It provides information on the cluster, profiles of the engineering enterprises and their products and clientele. It also offers



Harnessing the web for MSME development

an array of links to information resources and institutions relevant to the MSME sector, ranging from ministries, government departments and banks to credit rating agencies, training institutions, and industry associations. It is envisaged that by registering with the portal, BDS providers as well as MSME units will be able to expand their business linkages.

National Conference organized by BEE/UNIDO on financing energy efficiency in SMEs

The Bureau of Energy Efficiency (BEE) and UNIDO jointly organized a National Conference on Financing Mechanism for Energy Efficiency Improvement in SMEs on 18–19 November 2009 at New Delhi. The conference was addressed by speakers from various multilateral/bilateral organizations, ministries, financial institutions, executive agencies that are implementing BEE's SME program in 25 clusters, and government officials. The participants included over 100 representatives from international/national agencies working for SME sector, as well as a large number of entrepreneurs from SME

clusters. The focus of the event was on current energy performance, potential for energy conservation, possibilities of using renewable energy and various financing instruments available for improving energy efficiency in Indian SMEs. The conference also provided an opportunity for the different agencies working in the SME sector to come together and discuss their schemes/activities for energy efficiency improvement in this sector.

DBC for white iron melting: another milestone in Ahmedabad foundry cluster

On 16–17 December 2009, TERI successfully commissioned an 18-inch DBC (divided blast cupola) in Anish Metacast (P) Ltd, a foundry unit located in the Ahmedabad foundry cluster. This DBC is the fourth in a series of energy efficient smaller size (18-inch) DBCs installed in the cluster under a project partially supported by PCRA (Petroleum Conservation Research Association) in partnership with the local industry association, 'Ahmedabad Foundry Cluster', and GITCO (Gujarat Industrial and Technical Consultancy Organization Ltd).



DBC for melting white iron

A unique feature of this latest replication is that Anish Metacast is a 'white iron' foundry, unlike the 'grey iron' foundry units which earlier installed DBCs. Anish Metacast produces white iron castings for earthing plates (used in lamp posts) and grinding media (for cement industry). White iron is relatively high in hardness as compared to grey iron and low in carbon content (2.8–3.2%). In order to ensure that the DBC is capable of melting white iron so as to match the product specifications while improving energy efficiency as well, TERI undertook the demonstration procedure in two stages. On 16th December, the DBC was used to melt grey iron during a short trial run. After studying its performance, the DBC was successfully operated for a trial period of four hours on 17th December for melting white iron.

Proprietor Mohanlal Shah is pleased with the performance of the DBC—with good reason, as the following results show.

- The new system produces 1.6 tph (tonnes per hour) melt, as compared to 1.4 tph for the unit's conventional cupola.
- The bed coke consumption has been reduced by nearly 50%.

Following the successful demonstration, TERI provided training to the furnace operator and the proprietor in proper operating procedures, cupola brick lining, monitoring of daily production, and safety measures.

VSBK gets a boost in Tamil Nadu

As part of its ongoing efforts to promote the energy efficient VSBK for small-scale brick making, TERI has been interacting regularly with the Ministry of MSME, New Delhi to extend their VSBK promotional scheme to states other than those notified earlier (Chhatisgarh, Jharkhand, Madhya Pradesh, Orissa and Rajasthan). In November 2009, the Ministry of MSME has given in-principle approval for subsidy of about 60% for construction of six 2-shaft VSBKs in Tirunelveli district, Tamil Nadu (vide its 17th Steering Committee Meeting held at New Delhi on 11th November 2009). The state government of Tamil Nadu will provide an additional 10% subsidy for the project. The project will be implemented by ITCOT Consultancy and Services Ltd, Tamil Nadu; TERI will provide the necessary technical backup support.



Promoting VSBK in Tamil Nadu



Village electrification workshop

Workshops held on village electrification

The Ministry of Power has issued guidelines for promoting village electrification through decentralized distributed generation (DDG) under the Rajiv Gandhi Grameen Vidyutikaran Yojana (RGGVY) scheme. TERI has partnered with the Rural Electrification Corporation (REC) to organize a series of one-day workshops in different regions of the country in order to create awareness among stakeholders about the DDG programme, and to provide a platform for the stakeholders to discuss implementation and monitoring arrangements for DDG projects under the RGGVY scheme.

TERI has already conducted four regional workshops: at Chandigarh on 13th November, Guwahati on 25th November, Jabalpur on 3rd December, and Hyderabad on 15th December 2009. The participants at these workshops included representatives from state renewable energy development agencies (SREDAs), the local REC centres, state utilities, NGOs, equipment suppliers, and project developers.

Stoking hope in Firozabad

As reported in earlier issues, TERI with the support of SDC has successfully developed, demonstrated and promoted two natural gas-based energy efficient technologies for glass units in the Firozabad glass cluster:

(1) recuperative pot furnace for melting

glass to make bangles, and (2) gas-fired muffle furnace (pakai bhatti) for baking the bangles. Over half the pot furnace units in Firozabad have since adopted the TERI-design recuperative furnace. However, replication of the gas-fired muffle furnace has been severely hampered because the pakai bhatti units are individually small in size and located in densely populated areas of Firozabad, making it difficult for GAIL India Ltd to supply gas to these units for economic and safety reasons.

Over the years, pot furnace units as well as pakai bhatti owners have been lobbying with GAIL and the government to address the following issues, without much success:

- There is considerable variance in the gas quotas available to different pot furnace units – an outcome of the uncertain period in the late '90s when glass units had to switch over from coal to gas firing, and were unsure as to how much gas they would require for routine operations. As any gas drawn in excess of quota attracts a much higher price, pot furnace units have to cope with varying costs of production as energy forms an important component of the overall production cost (R-LNG). Some of the units, which have lower gas quotas want to enhance their allocation to about 3500 Sm³/day, which will enable them to operate their units without paying the higher costs of R-LNG.
- The 13 pakai bhatti associations in Firozabad want GAIL to supply them with gas so that they may utilize the TERI-design muffle furnace, which offers higher productivity as well as a virtually smokeless working environment compared to the present coal-fired pakai bhattis. For this purpose the pakai bhatti owners are willing to form groups and function from common sheds to make it feasible for GAIL to supply them with gas.

At last, however, there may be good news for the bangle-making units in Firozabad. According to media reports, on 22nd December 2009, a delegation comprising prominent glass industry representatives led by the local Member of Parliament from Firozabad met the Union Petroleum Minister



TERI-design gas-fired muffle furnace in operation

in New Delhi. The minister indicated that their long-standing demands would receive favourable consideration.

If indeed GAIL agrees to supply gas to (grouped) pakai bhatti units, it will represent a great opportunity for TERI to promote replication of the gas-fired muffle furnace in the cluster. This will not only bring greater profits to the owners, but drastically reduce pollution from the units and thereby reduce respiratory ailments and other health problems that afflict a substantial section of Firozabad's population, particularly the children.

Training programme on improved brick making practices

An awareness-cum-training programme titled 'Recent advancements in brick making' was



Bareilly training programme in progress

jointly organized by the Badanu Brick Kiln Association, Bareilly Brick Kiln Association and TERI at Bareilly on 30th September 2009 for the benefit of about 60 brick kiln entrepreneurs.

TERI presented the opportunities that exist for the modernization of brick kilns and diversifying products towards alternatives such as REBs (resource efficient bricks). Dr K G K Warrier, Deputy Director and Head, Materials and Minerals Division, NIIST (National Institute for Interdisciplinary Science and Technology,

Thiruvananthapuram), provided details on various types of clays, their properties and suitability for brick making, and simple tests to check the properties of clay. Two progressive brick kiln entrepreneurs, Mr Sanjay Dadoo and Mr O P Badlani shared their experiences of using machines for green brick production and the benefits of using machines. Mr K K Vijayan, a machinery manufacturer, informed the participants about the machines that are available for the brick industry and urged the participants to consider mechanization of certain processes. Mr Pritpal Singh, expert from PSCST (Punjab State Council for Science and Technology, Chandigarh) elaborated on the BOP (best operating practices) to be followed in kiln operation and their advantages.

The event witnessed lively discussions on the benefits of mechanization, lack of awareness among entrepreneurs, lack of trained manpower, problems in getting suitable clay for brick making, and other pertinent issues. It represented another step in the ongoing endeavour to bring together technology experts, scientists and other important players such as machinery manufacturers on a common platform to discuss options to address the challenges in the brick industry, and thereby enable the industry to adopt better technologies in a sustainable manner.



Divided blast cupola



Gas-fired muffle furnace



Vertical shaft brick kiln



Gas-fired pot furnace



Biomass based power gasifier



Gasifier for namkeen making



Gasifier-based dyeing unit

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