



# CoSMiLE UPDATE

**A platform for learning and action for small and micro enterprises**

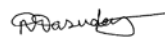
## Editorial

TERI has been closely involved with the small scale brick industry in India for about two decades. Although it is the backbone of the nation's construction sector, the Indian brick industry has not witnessed any major changes on the technological front apart from adopting measures to meet mandatory emission norms. As is characteristic of all rural industries, the small-scale brick industry is highly labour-intensive and generally does not employ technically qualified people. It has remained relatively untouched by the technology improvements that have taken place in European countries in terms of high levels of mechanization and innovation in products.

With the entry of large-scale manufacturers into the Indian market, coupled with changes in brick-use patterns in building constructions and increased difficulty in finding labour for brick kilns, it has become imperative for the small-scale brick producers to improve the efficiency of their production processes through mechanization, as well as to diversify their product mix. However, the lack of access to technologies for mechanization due to high costs continues to be a major hurdle for small-scale brick entrepreneurs.

TERI is presently implementing a project supported by UNDP-GEF that addresses both capacity building and market barriers in the brick sector. Under the project, it recently facilitated the visit to India by European Ceramic Technology Suppliers (ECTS)—a consortium of leading manufacturers of bricks, tiles and ceramic products from Europe. Meets were organized in Chandigarh and Varanasi to enable the ECTS delegates to interact with small-scale brick entrepreneurs from the major brick making regions of north India. The ECTS team evoked considerable enthusiasm from the entrepreneurs through active participation in the meets, as well as during field visits to brick kiln units. On their part, the ECTS team too evinced keen interest in working with the Indian brick industry for their mutual benefit. Access to European technologies would help Indian brick entrepreneurs improve productivity and increase profits. It would also enable them to diversify into making new products such as perforated bricks and hollow blocks, thereby reducing the consumption of a precious natural resource, top soil, which is presently being used in huge quantities for brick making.

However, the real challenge for Indian brick entrepreneurs is to invest huge resources for technology up-gradation coupled with the need for adaptation of these technologies to local conditions. There is a need for greater synergy between public and private sector players for collaborative RDD&D (Research, Development, Demonstration and Dissemination) efforts in order to facilitate the technology adaptation process. Through the UNDP-GEF project, TERI is providing a platform to address this challenge and smoothen the technology adoption process.



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## DSDS 2011: special event on 'Fast tracking energy conservation in MSMEs'

On the eve of the Delhi Sustainable Development Summit (DSDS) 2011 in New Delhi, TERI with the support of REEEP and SDC organized a special event on 'Fast tracking energy conservation in MSMEs'. The event, held on 2 February 2011, was attended by about 50 delegates, including representatives from REEEP; SDC; Ministry of MSME; Bureau of Energy Efficiency (BEE); UNIDO; UNDP; Technology Information, Forecasting and Assessment Council (TIFAC); industry associations; consultants; academia; and NGOs.

Mr Amit Kumar (TERI) highlighted the central role played by the MSME sector in the Indian economy. He elaborated on REEEP's focus on promoting both energy efficiency (EE) and renewable energy (RE) solutions for MSMEs. Dr Marianne Osterkorn (Director General, REEEP International Secretariat) observed that MSMEs not only offer great potential for energy savings through adoption of EE technologies, but are also potential providers of EE and RE technology-related services. The key challenges to be addressed in the MSME sector include: (1) financing of EE technologies; and (2) building human/institutional capacity to deploy and sustain technology upgradation in the long term. Dr Osterkorn mentioned that during 2010, REEEP provided support for 30 projects worth €30 million, while helping MSMEs in developing new products and adopting energy-



DSDS special event on MSMEs



DBC in Ahmedabad foundry cluster

saving measures. Besides financing projects, REEEP also promotes EE by providing a web-based information sharing platform for MSMEs and supporting events that bring together various stakeholders.

Mr Jitendra Sood (Energy Economist, BEE) spoke on the initiatives of BEE in the MSME sector. BEE is partnering with organizations like Global Environment Facility (GEF), World Bank, UNIDO, and Japan International Cooperation Agency (JICA) in several EE-focused initiatives across 29 MSME clusters belonging to different sub-sectors. BEE has established strong linkages with financial institutions like SIDBI in order to facilitate financing of EE technologies. Currently, it is in the process of gathering data on total energy consumption by the Indian MSME sector. Moreover, BEE has set an energy-saving target of 1.5 mtoe (million tonnes oil equivalent) by the year 2017 in the MSME sector by adopting various energy conservation measures.

Dr Gerolf Weigel (Embassy of Switzerland, India) spoke on the TERI-SDC partnership and its 17-year-long engagement with the

MSME involving two broad strategies: (1) developing technology delivery models; and (2) seeking a link with policy makers. The TERI-SDC initiatives have so far resulted in more than 600 replications of EE technologies in a number of MSME sub-sectors, thereby yielding energy savings of around 140,000 mtoe and CO<sub>2</sub> reductions of about 500,000 tonnes. Currently, Indo-Swiss Cooperation on Climate Change focuses on facilitating climate change mitigation through multi-stakeholder partnerships at different levels. Dr Weigel emphasized the need for bridging information gaps and gathering reliable data on energy-intensive MSME sectors.

Mr Prosanto Pal (TERI) summarized the EE solutions developed and disseminated under the TERI-SDC partnership, while citing the divided blast cupola (DBC) promoted in the foundry sector as an example. He outlined the ongoing REEEP-supported project in Coimbatore foundry cluster, under which the DBC has been adopted by eight foundry units as against three units targeted under the project. Mr Pradeep Kumar (Interim Office Director and Programme Manager, Alliance to Save Energy), elaborated on the activities undertaken and challenges encountered under a REEEP-supported project to promote EE in a rice mills cluster near Madurai, Tamil Nadu. Mr Sanjay Singh (Scientist-in-Charge, TIFAC), spoke on a project to promote EE in the Howrah foundry cluster. Mr I P Suresh Krishna (TERI) made a brief presentation on the salient features of the proposed SAMEEEKSHA website.

The addresses were followed by a panel discussion on '*Climate change innovation centres for SMEs: role of technology development and transfer*'. It was chaired by Ms Ayumi Fujino (Head, UNIDO, India Office). The other panelists of the discussion were: Dr Veena Joshi (Senior Advisor-Energy, SDC); Mr Abhay Bakre (Joint Development Commissioner, Ministry of MSME); Dr H Sundara Murty (Vice-President, Institute of Indian Foundrymen); Mr Sandeep Garg (Energy Economist, BEE); Mr Girish Sethi (TERI); and Dr Krishna Ravi Srinivas (Associate Fellow, Research Information System for Developing Nations). The following key points

emerged from the panel discussion and from inputs from the participants.

- *Industry associations are vital partners* in EE initiatives; yet they are often controlled by a few influential individuals in the cluster. This poses a major challenge to replications, as early adopters of EE technology usually comprise this handful of influential individuals, while the rest are not encouraged to follow suit. One solution is to have more one-on-one interactions with a spectrum of entrepreneurs before identifying demonstration units.
- *Handholding is required to promote improved technology.* Even a proven EE technology can fail to replicate when it is 'poorly' copied, without adhering to the required design and quality parameters as well as operating practices. The negative effects of 'poor' copying can be countered by strengthening technical capacities and putting in place cluster-level delivery mechanisms.
- *Leveraging government schemes.* Technology upgradation requires significant investments, which is one of the barriers for technology adoption. Availing of various government schemes would help MSME entrepreneurs meet their financial requirements. The government itself can play a proactive role in this regard, as exemplified by promotion of DBCs in Ahmedabad foundry cluster being promoted by PCRA and venturi scrubber for pollution control in Coimbatore foundry cluster by the Tamil Nadu Pollution Control Board.
- *Adopting best operating practices.* Besides the 'hardware' component of the EE technology (equipment/machinery designed and fabricated according to quality parameters, and so on), best operating practices (BOP) also play a crucial role in ensuring that EE technology delivers optimal benefits.
- *Establishing and strengthening system delivery experts.* It is essential to bridge the gap between EE technology developers/suppliers and the actual end-users of the technology. The need is for 'system delivery experts' at cluster level.
- *Promoting technology innovation centres.* In order to provide holistic and sustained

support to MSME clusters for EE initiatives, a long-term knowledge-based approach at cluster level is required. This entails long-term efforts for technology transfer, and capacity building and competence pooling at national and international levels. A cluster level technology innovation centre could play a crucial role in enabling EE initiatives in the MSME sector.

### **Training program for glass furnace masons**

TERI extends capacity building support to masons on furnace construction practices as part of its efforts to promote replication of the energy-efficient TERI-designed pot furnace in the Firozabad glass industry cluster. A training program on ‘*Refractory laying practices*’ was conducted on 31 March 2011 at a glass factory (S Rajeev Glass Works) where the construction of a pot furnace is under way.

Fifteen persons, comprising masons, artisans involved in re-lining activities, and entrepreneurs from different units participated in the training program that focused on the best practices involved in standard refractory lining of furnaces and common troubleshooting methodologies. Besides enabling the participants in sharing knowledge and experiences on the subject of refractory lining, the program also provided them with hands-on training in furnace lining work.

A manual on ‘*Lining practices of refractory in furnace construction*’ was distributed among



Hands on training for masons

the participants. It is expected that the training program will help the masons in constructing quality furnaces in the cluster. This, in turn, would enhance the melting campaigns and improve the overall performance of the units.

### **ITEC training program on renewable energy and energy efficiency**

TERI has been empanelled as a training institute under the Indian Technical and Economic Cooperation (ITEC) and Special Commonwealth Assistance for Africa (SCAAP) programs of the Government of India. The objective of these programs is to improve cooperation among developing countries. Under the aegis of ITEC, TERI organized an international training program on ‘Renewable energy and energy efficiency’



Training program for masons



Delegates at ITEC programme



Class room session

from 3–21 January 2011. The participants comprised 33 engineers, scientists, and policy makers from 24 developing countries of Africa, Asia, Europe, and the Americas.

The training program provided in-depth understanding of concepts related to renewable energy, energy conservation, and energy efficiency; their applications; policy aspects; and practical demonstrations of energy-efficient/renewable energy technologies through field visits and at TERI's research facility in Gurgaon, Haryana. The program also included a week's stint at TERI's Southern Regional Centre (TERI-SRC) in Bengaluru.

The program was divided into three modules. The first module covered the theoretical aspects of renewable energy (biomass, solar, wind, and small hydro), industrial energy efficiency, and the use of 'RETScreen' software to analyse and evaluate energy performance and related parameters for various types of renewable energy and energy-efficient technologies. The second module comprised site visits to understand operational aspects of biomass gasifier systems, waste-to-energy systems, and a small-scale manufacturing industry. The third module covered energy conservation and energy efficiency in industry, green building concepts, and visits to a solar photovoltaic manufacturing plant, Mahatma Gandhi Institute of Rural Energy and Development, and a biomass gasifier unit to gain first-hand knowledge on thermal applications.

### **UNIDO delegates visit Firozabad**

On 25 March 2011, TERI facilitated a visit by UNIDO officials to the Firozabad glass cluster. The objective was to showcase the



Auxiliary furnace for bangle making

achievements under TERI-SDC partnership project and the possibilities of scaling up the energy-efficient technologies that have been successfully introduced as part of the project. The delegates included Ms Ayumi Fujino (Head, UNIDO-India) and Mr Antonio Levissianos, (Officer in Charge, UNIDO-India).

At Firozabad, the delegates visited a bangle-making unit, which has adopted two TERI-designed pot furnaces. An interactive session with the owner helped the delegates understand the benefits of the TERI-SDC intervention. The delegates were also apprised of the potential that exists for improvements in other auxiliary processes. The team paid a visit to the Centre for Development of Glass Industry (CDGI), where the CDGI officials outlined their activities in the Firozabad glass cluster and took the delegates around their training and laboratory facilities.

### **International conferences on mechanization in brick industry**

Under the UNDP-GEF project to promote energy efficiency in the brick sector, TERI organized two international conferences on '*Mechanization in brick industry*' in association with the Punjab State Council for Science and Technology (PSCST) at Chandigarh on 10 March 2011, and with Int Nirmata Parishad (INP) at Varanasi on 12 March 2011.

## Chandigarh conference

The event was attended by over 550 brick kiln entrepreneurs from 14 Indian states. Other participants included representatives from various state/central government departments, donors, international technology providers and machinery manufacturers, R&D institutions, banks, and organizations engaged in technical consultancy.

Mr Viswajeet Khanna (Secretary, Department of Science, Technology and Environment, Government of Punjab), who inaugurated the conference, elaborated that the construction boom in the country is leading to rapid growth in the brick industry and thereby adding to its carbon footprint. Mr Girish Sethi (TERI) provided an overview of the project and highlighted the challenges to be overcome at unit, cluster, and policy levels in order to introduce improved technology in the brick sector. Mr Srinivasan Iyer (Assistant Country Director, UNDP, India) in his keynote address mentioned that as the third largest consumer of coal in the country, the brick industry would be hit hard by rising fuel prices. Mr Alessandro Colucci (European Ceramic Technology Suppliers) presented an international perspective on issues related to the development and promotion of energy-efficient technologies. He urged brick entrepreneurs to form cooperatives and pool

their technical and financial resources while putting new technology to practice.

During the technical sessions, Mr M S Jaggi and Mr Pritpal Singh (PSCST) stressed on the importance of mechanization of processes in order to enhance energy efficiency and enable the manufacture of high-quality products like resource-efficient bricks (REBs). For this, training as well as technical backup support are needed for entrepreneurs and workers, both during and after adoption of the improved technologies. Dr K G K Warriar (National Institute for Interdisciplinary Science and Technology, Thiruvananthapuram) summarized the preliminary findings of an investigation by NIIST on seven clay samples collected jointly by PSCST and TERI from the Punjab and Uttar Pradesh regions to explore their suitability in making REBs. Officials from UNDP-GEF projects in the brick sector in other Asian countries (Bangladesh and Vietnam) shared their experiences. A number of European technology suppliers provided an overview of different REB technologies and expressed their desire to work in India.

An exhibition was organized during the conference, which enabled participants to interact extensively with different national and international technology suppliers as well as with representatives of a local bank (Corporation Bank).



Chandigarh conference

## Varanasi conference

The event was attended by over 200 brick entrepreneurs—most of them were from Uttar Pradesh, while a few were from Nepal. The primary focus was on strengthening awareness among the brick entrepreneurs on various modern technologies for manufacturing REBs, and exploring the possibility of obtaining finance for these new/improved technologies. Mr Kamla Kant Pandey (President, INP) welcomed the opportunity provided by the event for brick entrepreneurs to interact with international suppliers of improved brick-making technologies and machinery. Mr Eckhard Rimpel (Institut for Ziegelforschung, Essen, Germany) highlighted the importance of studying the characteristics of local clays before introducing any change in technology.

Mr A K Srivastav (Assistant General Manager, State Bank of India, Varanasi), who was the chief guest, pointed to the urgent need for brick entrepreneurs of the region to adopt mechanization of processes, since there is a shortage in the availability of workers. While noting that energy-efficient technologies for manufacturing REBs usually require high capital investment, he assured the entrepreneurs that banks are willing to finance viable projects that intend to acquire and implement such technologies. During the technical session, technology suppliers from Belgium, Germany, Greece, Spain, and the Netherlands made presentations on various technologies that can be utilized for production of hollow blocks and perforated bricks.



Varanasi conference



Field visit at Varanasi

## DBC replications quicken in Rajkot foundry cluster

Replications of the TERI-design DBC have been taking place at an accelerated pace in Rajkot cluster during the past six months or so, thanks to TERI's focused efforts at strengthening the capacities of fabricators and other business development service (BDS) providers in the cluster. The DBCs that are currently in various stages of implementation in the cluster are shown below. With the installation of these DBCs, a total of 30 TERI-design DBCs will have been adopted by foundry units in the Rajkot cluster.

Unit	DBC details		
	Replications	Internal diameter	Status
Gautam Technocast	2	21 inch	Fabrication completed
Steelcon Metalcast	1	21 inch	Commissioned
Parva Metal Processing Company	1	27 inch	Under installation
Shivanand Casting	1	24 inch	Under installation
Carbotech Industries	1	33 inch	Under installation
Die Cast Industries	1	18 inch	Under fabrication
Ganga R K Industries	2	18 inch	Under fabrication



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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