CoSMiLE UPDATE

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A platform for learning and action for small and micro enterprises

Editorial

MSME (micro, small, and medium industries) – constituting almost 90% of the total industrial establishments in India – account for about 40% of the industrial production and 35% of the total exports in the manufacturing sector. In a global competitive market, the MSME sector is facing a number of challenges. Besides using fossil fuels, a large number of MSMEs in the unorganized and rural sectors use huge quantities of biomass fuels in an extremely inefficient manner. Since the energy costs form a significant part of their operating costs, efficient utilization of energy resources becomes a priority in order to enhance their competitiveness.

The competitiveness of MSMEs apart, there is another reason for urgency in identifying alternatives to conventional fuels and this arises from the concerns about climate change. Indeed, India's 'National Action Plan on Climate Change', under its National Mission on Enhanced Energy Efficiency in Industry, outlines fuel switch as one of the GHG (greenhouse gas) mitigation options and says, *'Another option is switching over from fossil fuels to producer gas from biomass fuels for various thermal applications.'*

TERI has been trying to ascertain the potential of renewable energy technologies in MSMEs covering sectors such as textile; paper and pulp; food processing; steel re-rolling; ceramic; and cardamom drying. These sectors exhibit high process heat requirements. The share of thermal energy in the total energy requirements in some of these sectors goes as high as 90%. Thermal energy needs of these MSMEs vary over a wide range of temperatures (from 80 °C to 1200 °C), depending on the type of industry, type of application, and type of process adopted for a given application. Broadly, the applications pertain to water heating, steam generation, drying, kilns, and furnaces.

As far as fuels are concerned, MSMEs use a variety of fuels such as coal, coke, charcoal, biomass, diesel, LPG (liquefied petroleum gas), and furnace oil. Given the fact that the country has about 150 million tonnes of surplus biomass, biomass-based technologies such as biomass gasification offer a viable option for meeting thermal energy needs of MSMEs in the aforementioned sectors. TERI's estimates show that there is a potential of reduction of GHG emissions by 15%–30% through substitution of 25%–50% of furnace oil, LPG, and biomass; and 10%–25% of coal utilization. Looking at the surplus biomass availability in the country, it is certainly feasible.

Besides fuel saving and climate change mitigation, the other benefits of biomass gasifiers in MSMEs include productivity enhancement, improved product quality, as well as employment generation, especially for relatively weaker sections of the society. However, in order to convert this potential into real business, greater focus would be required on strengthening the complete market chains, including the long-term biomass supplies.

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Contents

In this issue

The Energy and Resources Institute

Promoting alternate livelihood options for women

Brick firemen community

PEPUS, TERI's NGO partner working among the firemen community in eastern Uttar Pradesh, organized an awareness workshop during 26–27 August 2008 on alternate livelihood options for women. The event was held at the Knowledge Hub, Lalgopalganj, Allahabad, and was attended by 57 women. The objectives of the workshop included creating awareness about the various policies and programmes of the government as well as non-government agencies meant to benefit communities at panchayat level; motivating participants to avail the benefits of these schemes; identifying alternative livelihood options for women, and chalking out strategies by which the women could take up these alternatives.

The workshop sessions were conducted with the help of two resource persons: Mr V K Rai, Director, CERT (Centre for Environment and Rural Technology) and Ms Poonam, an expert in making jute bags from Allahabad. The sessions were highly interactive, with inputs provided through lectures, group discussions, and role-plays. The participants were given information on government schemes such as NREGS (National Rural Employment Guarantee Scheme) and SGSY (Swarnjayanti Gram Swarozgar Yojana). They were also given an outline of various schemes being run through NGOs to benefit village communities. These included the following.

Interactive session

Training session for women artisans

- Using the SHG (self-help group) route to explore and take up livelihood options
- Promoting the practice of perennial farming
- Identifying and promoting occupations that utilize the traditional skills and knowledge possessed by women; for instance, making jute bags
- Promoting the sharing of knowledge, skills and experience

Glass artisans

The CoSMiLE project recently organized a programme aimed at providing alternative livelihood options for women artisans in the Firozabad glass cluster. Traditionally, women are engaged in household-level bangle finishing operations such as *sedhai* (straightening) and *judai* (joining). These jobs do not pay well, and also expose the women to high levels of indoor air pollution. There is a possibility that after their *judai/sedhai* work, and household chores, the women might be able to find some other jobs, and add to their incomes. However, they lack both skills and opportunities to take up other occupations.

Vikas Sansthan, the NGO partner in the glass sector intervention, facilitated a training programme on alternative livelihood options for 32 women from various SHGs in Daukeli and Makhanpur during June/July 2008 at its

premises in Shikohabad. With the help of external faculty, the programme focused on providing the participants with knowledge and hands-on training in making artificial jewellery using materials like terracotta, jute, and glass beads.

These women now have an opportunity to augment their household income in their spare time by making and marketing artificial jewellery—an activity that is less harmful to health than *sedhai* and *judai*.

TERI–PCRA workshop for promotion of DBCs

As reported in the June 2008 issue of this bulletin (Vol. 3, issue 2), TERI is engaged in a project to promote replications of the DBC (divided blast cupola) in Ahmedabad. The project involves design, development and demonstration of an 18-inch DBC in four foundry units. This initiative is being supported by the PCRA (Petroleum Conservation Research Association). TERI is partnering with the Ahmedabad Foundry Cluster (the local foundry association) and GITCO (Gujarat Industrial and Technical Consultancy Organization Ltd) for the implementation of the project.

On 7 August 2008, TERI and PCRA organized a workshop to enhance awareness among local entrepreneurs on the aims of the project and the benefits offered by the DBC. The workshop was held at the Common Facility Centre, Odhav (established for the foundry industry). Mr A K Goel, Director, PCRA, placed the project in perspective by describing the initiatives taken by PCRA to promote commercialization of new, energy-efficient technologies. He mentioned that under the current project, PCRA will encourage adoption of the DBC by meeting part of the hardware costs for the first four units. TERI presented the techno-economic aspects of the DBC, which was followed by an interactive session.

Subsequent to the workshop, three foundry units have expressed their interest in participating in the project as 'model units' for demonstration of the DBC. The units include the following.

- Vijay Foundry
- Bharti Manufacturing
- Bharat Foundry

DBCs being adopted by Bangladesh foundries

TERI is assisting two foundry units in the Bogra foundry cluster in Bangladesh in adopting DBCs. It may be recalled that in June 2007 TERI visited Bogra cluster at the behest of the Foundry Owners' Association of Bangladesh in order to promote adoption of energy-efficient DBCs (see *CoSMiLE Update* Vol. 2, issue 3, September 2007).

Two units in Bogra are now in the process of installing DBCs. A 33-inch ID (internal diameter) DBC is being set up at Milton Metal Works, and a 30-inch ID DBC at Bashar Metal Works. TERI is providing technical support to these units in interpretation of design drawings; selection of Indian suppliers for equipment; and pre-shipment checking of certain components.

DBC fabrication in progress for Bangladesh foundries

Anchor team training to promote modern biomass technologies

TERI conducted a five-day training programme at Bangalore during 21–25 July 2008 titled 'Anchor Team Training Programme' to promote modern biomass energy technologies. The event was co-sponsored by the MGIRED (Mahatma Gandhi Institute of Rural Energy and Development) and aimed to strengthen capacities of the potential service providers, as well as prospective trainers in biomass energy technologies. About 24 participants took part in the event. They came from different sectors – engineering colleges (where alternative energy is a subject), government organizations, NGOs and MSMEs. The programme had two unique aspects: (1) project-based learning to equip the anchors to identify potential enterprises and develop business plans for feasible interventions, and (2) business meets/ interactions between gasifier manufacturers.

Besides classroom sessions, the participants were taken to enterprises where biomass systems were in operation, in order to expose them to actual field conditions and provide them with an opportunity to interact with entrepreneurs and workers. This enabled the participants to understand techno-economic aspects of the biomass-based devices and their various configurations/specifications.

Classroom session for anchor team

Cleaner production through greener supply chain: the SUSBIZ project

TERI is an external partner in the project titled 'SUSBIZ' (Sustainable Business in India) established by the DFSMSE (Danish Federation of Small and Medium-Sized Enterprises) and CCCR (Copenhagen Centre for Corporate Responsibility) and co-financed by Denmark's Ministry of Foreign Affairs. DFSMSE is a private organization whose main objective is to provide guidance to SMEs in Denmark so as to optimize conditions for growth and development. The CCCR is an independent think-tank set up by the Danish government with the primary aim of generating knowledge and bringing together business leaders and decision-makers to debate the changing role of business in society.

The SUSBIZ project supports eight Danish SMEs that wish to strengthen ties with their Indian suppliers by raising the standards (at the suppliers' end) related to working environment, labour rights, cleaner production, and so on. Better workplace conditions would benefit the Indian suppliers by improving productivity and product quality, as well as cutting down on delivery time. The Danish SMEs too would benefit, because their clients are concerned about social and environmental conditions in the supply chain.

As a first step, TERI conducted a 'needs assessment' study of the supplier-firms located in the vicinity of Delhi. This exercise highlighted the importance of energy efficiency in improving productivity, profitability and workplace environment in the firms concerned.

Next, TERI performed an energy audit of one of the firms—

Magnum Polymers, a plastic moulding unit located in Faridabad. The audit results helped TERI in developing a training module for improving energy efficiency through various housekeeping measures and BOP (best operating practices).

Subsequently, TERI conducted a number of sessions in a workshop organized by SUSBIZ for the supplier-firms at Coimbatore during 24–25 May 2008. The topics included the principles of energy management, different kinds of energy efficient equipment, energy audits and energy conservation. TERI also shared the findings of the energy audit conducted at Magnum Polymers, which evoked interest among a number of other participant-firms.

Panel discussion on bio-energy

On 29 July 2008, a panel discussion on biomass-based energy titled 'Enhancing the focus of bioenergy options' was organized at Chennai by MSSRF (MS Swaminathan Research Foundation). The panelists comprised Prof. M S Swaminathan, Chairman, MSSRF; Dr V V N Kishore, Senior Fellow, TERI; Dr S Dasappa, Programme Executive, IISc (Indian Institute of Science), Bangalore; Mr M Rajagopalan, Vice-President (South), Wartsila India; Mr Shanmugam, President, Odanthurai Panchayat, Coimbatore; and Mr A M Gokhale, Executive Director, MSSRF. The discussions focused on the use of biomass resources to meet thermal and electrical energy needs, particularly among MSMEs (micro, small and medium enterprises) and in rural areas.

Dr Swaminathan spoke in the context of the Solar Energy Mission launched by the Government of India to promote the use of solar energy devices. Pointing out that solar energy technologies are expensive, he stressed the need for the government to launch a 'Mission on Bio-energy' to promote biomass-based energy, which is much cheaper than solar energy. Mr Shanmugam described how villages under the Odanthurai panchayat have successfully been using biomass gasifier-based pumpsets for irrigation for over four years.

Dr Dasappa explained that the basic energy needs of villages – for irrigation, agro-processing industries, domestic purposes and rural transport – could easily be met by utilizing the available biomass resources at every village. The cost of energy production from biomass would be lower than that from fossil fuels. Besides, the village community could own the biomass energy systems and thereby ensure uninterrupted power supply.

Dr Kishore emphasized the fact that biomass resources provided a clean, eco-friendly source of energy with great potential for achieving energy security without conflicting with food production. Using biomass energy would also reduce the consumption of fossil fuels. According to the Biomass Atlas prepared by the IISc, India produced around 546.4 MT (million tonnes) of biomass in 1998/99 (surplus 139.4 MT). Based on an estimated annual growth rate of 2.12%, TERI has projected the biomass production at 701 MT in 2010/11 (surplus 178.8 MT) and 938 MT in 2024/25 (surplus 239.2 MT). Given this vast potential, biomass energy can play a greater role in meeting the basic energy requirements of the country at relatively low costs.

Participation in renewable energy workshop

The NTPC (National Thermal Power Corporation) organized a workshop on 'Renewable Energy and Distributed Generation' during 27–29 August 2008 at its Power Management Institute, Noida. The event sought to address issues related to implementation of renewable energy projects. During the workshop, Dr V V N Kishore, Senior Fellow, TERI made a presentation on 'Two-stage biomass gasifier' on 29 August 2008. It provided an overview of decentralized distributed generation with emphasis on biomass-gasifier-based systems; present status; and challenges and opportunities in commercializing the gasifier technologies. The workshop assumes significance in view of the fact that-NTPC plans an additional capacity of 1000 MW from renewable energy sources.

Awareness programme on modern biomass technologies at Belgaum

TERI, in association with the GSSC (Govindram Seksaria Science College) and Phoenix Products of Belgaum organized an awareness programme on 'Modern Biomass Technologies' at the GSS premises on 9 July 2008. The programme comprised a technical session and an exhibition. The participants included representatives from the SKE Society, BVB College of Engineering, MSMEs, NGOs, and academic institutions. The programme was attended by about 100 people during the technical session, and more than 500 people visited the exhibition. TERI shared information on the successful interventions and case studies carried out under the CoSMiLE project. The exhibition showcased the biomass technologies of TERI, Phoenix Products and ARTI. Devices such as gasifier- based cooking oven, deep-frying ovens, large cookstoves, and water heaters were demonstrated.

Showcasing biomass devices at the exhibition

Booklet on energy efficiency released for Pune food processing cluster

SIDBI (Small Industries Development Bank of India) is implementing a multi-agency project on financing and development of MSMEs with support from DFID (Department for International Development). A key feature of this project is the provision of BDS (Business Development Services)—that is, a wide range of services that will help MSME units operate more efficiently.

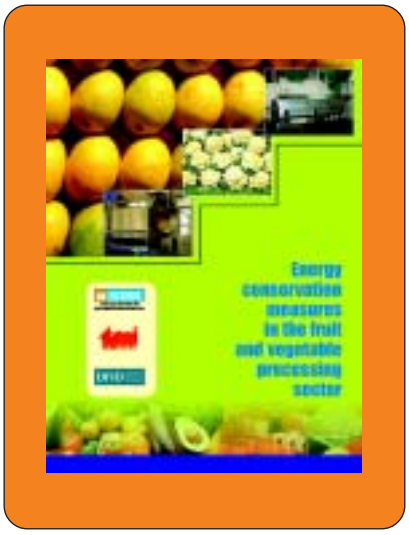
As part of the BDS strategy, TERI was entrusted by SIDBI (Small Industries DevelopmentBank of India) to study the fruit and vegetable processing industry cluster located in Pune. The objective of the study was to find simple, cost-effective solutions that would reduce energy costs and thereby improve the competitiveness of the units (See *CoSMiLE Update* Vol. 3, issue 1, March 2008). TERI conducted a 'walk-through' audit of the food processing units in the cluster to study energy consumption pattern and identify areas in which cost-effective measures could be adopted to save energy. TERI pinpointed areas that consume large amounts of energy in typical food processing units, as shown in the table on the next page.

Thereafter, TERI identified a number of energy-saving measures that units could take in different stages of operations. In order to increase awareness among entrepreneurs and

Type of products	*High energy consumption areas*
Frozen fruits/vegetables	Boiler, refrigeration, cold storage, blast freezing, motors, cooling tower
Tomato ketchup/puree/juice, sauces, canned fruits and vegetables, fruit pulps, juices	Boiler, steam heating, steam traps, motors
Ready-to-cook, ready-to-eat, instant mixes, soup mixes and pickles, spices, chutneys	Grinding and pulverizing, motors, air compressor, lighting
Candies and jellies	Boiler, steam processing, motors

workers on the need to save energy, and to guide them on energy-saving measures that they can take, TERI brought out a comprehensive booklet titled *Energy conservation measures in the fruit and vegetable processing sector*. The booklet presents the various energy-saving measures that food processing units can adopt in the following broad areas.

- Steam generation and distribution system
- Compressed air system
- Electrical distribution system
- Lighting
- Motors
- Refrigeration system
- Cooling towers
- Diesel generating sets
- Process



The booklet was released at a workshop organized by SIDBI in Pune on 3 October 2008. The participants at the workshop included senior officials from SIDBI, DFID, UNIDO and MCCIA (Maharashtra Chambers of Commerce, Industry and Agriculture). It is hoped that this booklet will enable the food processing units in Pune to cut down energy costs and improve their competitiveness, in tune with the BDS strategy of the SIDBI project.

Events calendar

1. Social training programme for brick firemen community; 10–11 September 2008, Block Satawaan.
2. Annual s*ammelan* of brick firemen community; Rai Barelli, 4 October 2008.
3. Technological training programme for master firemen/ firemen in brick industry; 20–21 October 2008, Suchi.
4. Technological training programme for master firemen/ firemen in brick industry; 22–23 October 2008, Rai Barelli
5. Partners meet on 'Development and testing of improved biomass gasifier stove', December 2008.

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