

CoSMiLE UPDATE

A platform for learning and action for small and micro enterprises

Editorial

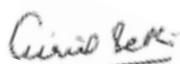
During the past fifteen years of our work at The Energy and Resources Institute (TERI) and Swiss Agency for Development and Cooperation (SDC) respectively, we have seen projects as interventions to initiate a process of desirable change and not as interventions to facilitate change as a whole. The challenge always has been to evolve projects in such a way that they remain relevant over time.

CoSMiLE is a good example of how this can be achieved. Based on the recommendations of an expert panel during the Screening Workshop in December 1994, SDC and its partners including TERI developed energy and environment options in the select energy intensive sectors in small and micro enterprises. What started as an action research effort, developed into a credible approach for intervening in the small-scale industry sector. The principles of competence pooling, participatory solution development, and capacity building of local service providers has been at the core of achievements of the CoSMiLE project. The CoSMiLE Update has covered the project achievements over the past three and half years in a systematic manner.

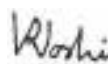
At this juncture, the CoSMiLE project is working towards transforming the face of new realities in the context. At the level of broad frameworks, the SDC in India will soon be part of SDC's Global Programme on Climate Change (GPCC). GPCC is actively engaged in mitigation, adaptation, and policy dialogue on climate. It focuses primarily on China, India, South Africa, and the Andean region. In India, the National Mission on Enhanced Energy Efficiency (NMEEE) has been set up, which is one of the eight missions of the National Action Plan on Climate Change (NAPCC). The implementation framework of NMEEE prepared by the Ministry of Power and the Bureau of Energy Efficiency (BEE) was recently approved by the Union Cabinet. NMEEE is seen as a major and effective means of climate change mitigation measures.

In addition during the last few years, energy use in the MSME sector has drawn attention of government agencies including BEE; Ministry of Micro, Small, and Medium Enterprises; and Small Industries Development Bank of India (SIDBI) as well as other donor agencies like UNDP, UNIDO, World Bank, JICA, REEEP, and so on. Today, interventions are proposed in about 50 SME clusters out of about 180 energy intensive clusters. In some of the programmes like the BEE-SME scheme, the intervention approach focuses on undertaking detailed energy audits and preparing Detailed Project Reports (DPRs) for potential projects in different SME clusters. TERI is working closely with the BEE in this initiative. In addition, TERI has become a major knowledge partner in some of these initiatives. The next coordination committee meeting of various agencies active in this field is scheduled in the 3rd quarter of 2010 and amongst other things, it will discuss ways to develop a mechanism for regular exchange of information and experiences of working in different SME clusters.

SDC and TERI are proposing to organize a side event during the next UNFCCC Conference of Parties (CoP) meeting in Cancun, Mexico later this year that will showcase CoSMiLE as an example of facilitating innovative technology development in small and medium enterprises and initiate a dialogue on how such successful, bilaterally assisted programmes can be up-scaled to develop multilateral initiatives on various themes that are relevant to climate change. At this dialogue, we also hope to get newer ideas on capitalizing the CoSMiLE approach for the next phase of TERI-SDC partnership in the MSME sector.



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Promoting energy efficiency in Kerala

TERI is providing technical expertise and capacity building services in the implementation of a programme titled 'Total Energy Security Mission' (TESM) in the state of Kerala by the Agency for Non-Conventional Energy and Rural Technology (ANERT)—an autonomous organization set up in 1986 by the Government of Kerala— now functioning under the state power department. ANERT is also the nodal agency in Kerala for the Ministry of New and Renewable Energy (MNRE). In essence, TESH is a plan of action that will enable ANERT to assess the energy consumption in different sectors of the state economy, identify options in each sector for energy efficiency and energy conservation, and explore possibilities of replacing the existing sources of energy with renewable energy sources. Kerala is richly endowed with biomass resources, ranging from agro wastes such as coconut shells and paddy husk to woody biomass from plantations such as rubber wood, cashew kernels, and so on. Hence, TESH focuses specifically on identifying and promoting biomass-based energy solutions wherever possible. The programme is being undertaken with the active participation of local-level institutions such as district and gram panchayats and municipal bodies.

One of the components of TESH is a project titled 'Technology Development



Plywood unit in Kerala

for Rural Industries', which entails collection and assessment of relevant data from different MSME clusters in the state, in order to identify potential options in each cluster for energy efficiency and renewable energy.

TERI and ANERT selected a number of MSME clusters for initial activities under the project. In May 2010, the TERI and



Bell metal making in Kerala



Pottery unit in Palakkad in Kerala

ANERT team visited representative units in each of the chosen clusters. The exercise aimed at gathering and assessing data on patterns of energy use, existing technologies, and operating practices in order to identify potential energy-saving measures and renewable energy options.

Industry	Cluster	Energy form
Pottery	Andimadam, Palakkad	Fuelwood
Casting	Kanjikkode, Palakkad	Hard coke
Pottery	Aloor, Thrissur	Coconut shell
Brick making	Kizhakke Aloor, Thrissur	Fuelwood
Ceramic tiles	Chittisseri, Thrissur	Fuelwood; electricity
Bell metal ware	Nandavarambam, Thrissur	Fuelwood; electricity
Plywood	Asamanoor (Perumbavoor), Ernakulam	Fuelwood; electricity
Rubber treading	Airapuram (Perumbavoor), Ernakulam	Electricity; diesel

Biomass gasifiers for guar gum extraction

The Petroleum Conservation Research Association (PCRA) is supporting TERI in a project to promote biomass gasifiers for thermal applications among small-scale guar gum extraction units in Jodhpur. The project will focus its activities on (1) creating awareness among entrepreneurs in the Jodhpur guar gum cluster about the benefits offered by biomass gasifier systems, and (2) developing and demonstrating three biomass gasifier-based heating systems to substitute the existing diesel-based furnaces.

Guar gum is produced by drying, roasting, de-husking, and polishing guar seeds to get refined guar ‘splits’, which are pulverized into various mesh sizes for use in different industries such as food processing, oil well drilling, and explosives. Most of the guar gum units in Jodhpur use diesel, furnace oil or liquefied petroleum gas (LPG) for heating applications in the extraction process. In the

face of increasing fossil fuel prices, and given the ready availability of firewood at relatively low prices, biomass gasification technology offers an attractive option for units in Jodhpur to reduce input costs and increase profits. A working estimate is that one litre of diesel can be replaced by four kilograms of firewood. With diesel costing around 35 rupees per litre and firewood barely Rs 1.50 per kg, there is huge potential for cost savings in guar gum extraction through the use of suitable biomass gasifier systems.

On 5 May 2010, the project organized an ‘inception’ workshop in Jodhpur to spread awareness among cluster stakeholders on the potential benefits offered by biomass gasification technology and on the aims and proposed activities of the project. The event was attended by around 35 participants including guar gum entrepreneurs, office bearers of the Marudhara Industries Association (the local industries association), other industry representatives from the cluster, and gasifier manufacturers.

Mr Suman Kumar elaborated on PCRA’s initiatives in promoting energy efficiency and environment-friendly technologies in industrial clusters in Rajasthan. He placed the project in the context of the growing scarcity and rising prices of fossil fuels in India and the international market, which makes it important as well as beneficial for industries to switch from fossil fuels to renewable energy sources such as biomass. Mr Sunil Dhingra and Mr N K Ram of TERI provided an outline



Inception workshop in Jodhpur

of biomass gasification technology, cited TERI's success in developing and promoting biomass gasifier systems for different thermal applications in a number of MSME clusters across the country, and explained how biomass gasifier-based systems could benefit guar gum units in terms of reduced fuel costs and increased profitability. The participants were also shown a short video on biomass gasifiers.

Mr Kiran Desai of JNS Technologies, a veteran in the guar gum industry, shared his knowledge and experience of the guar gum production process. He stressed the importance of improving process efficiency and observed that biomass gasifier technology could bring great benefits.

A highlight of the event was a presentation by Mr Pradeep Singhvi, a bakery owner from the cluster who has been using a biomass gasifier system for two years. In a highly interactive session, he described how switching over from fossil fuel-based heating to a biomass gasifier system has helped him reduce operating costs and improve earnings. As someone who has actually used and benefited from a biomass gasifier system, Mr Singhvi's observations struck a powerful chord with the participants.

At the end of the workshop, the entrepreneurs filled out 'expression of interest' (EOI) forms, which have helped identify three units in which biomass gasifier systems will be set up and demonstrated under the project.

Knowledge exchange: Rajkot entrepreneurs visit Coimbatore engineering cluster

TERI strives to build upon and upscale the benefits of its ongoing work in the MSME sector under CoSMiLE, by synergizing these benefits with other initiatives aimed at development of the sector through technology improvement, knowledge sharing, and capacity building. One such initiative is the Renewable Energy & Energy Efficiency Partnership (REEEP) project being implemented by TERI in the Coimbatore foundry cluster, which focuses on promoting energy efficient melting technologies such as the TERI-designed DBC



Rajkot delegates at Techno4 2010 exhibition

through technology demonstration and the building of cluster-level capacities. Another is the World Bank-led multi-agency/multi-activity project to improve the access of small and medium enterprises (SME) to finance and business development services (BDS), being implemented jointly by Small Industries Development Bank of India (SIDBI) and TERI in two SME clusters—the Rajkot engineering cluster and the Chandigarh–Mohali–Panchkula 'tricity' engineering cluster.

As an example of this synergetic approach, a team of seven delegates from the Rajkot engineering cluster, comprising entrepreneurs and BDS providers associated with foundries and pump manufacturing industries, visited Coimbatore – a hub of engineering industries including foundries and pump manufacturing units – from 9 to 11 April 2010. The visit was organized by the SIDBI–Rajkot project. During their tour, the delegates visited prominent pump manufacturing industries in the industrial estate at Coimbatore. They were deeply impressed by the high levels of quality maintained in the plants, and by the exemplary work culture.

The delegates also interacted with the office bearers of Coimbatore Industrial Infrastructure Association (COINDIA), a very dynamic and successful association of MSME entrepreneurs of Coimbatore, who shared their experiences with the visiting delegates and also inspired the office bearers of the Rajkot Engineering Association (REA) to replicate their own successful strategies.



Rajkot delegates at Coindia centre

The delegates were particularly fascinated by the development and manufacturing related services provided by COINDIA to the local industry such as training, testing, sand reclamation facilities for small foundries, rapid prototyping, and tool room facilities.

The delegates also visited Small Industries' Testing and Research Centre (Si'Tarc), an NABL-accredited testing and calibration

laboratory having facilities for testing and development of pump designs.

The highlight of the tour was a visit to a technology exhibition – 'Techno4 2010' – that showcased the products, technologies, and services related to four engineering sectors: pumps and ancillary equipments, motor and rotating machines, foundry, and the light engineering industry. The event was organized by Orbitz Exhibitions in association with SIEMA (Southern India Engineering Manufacturers' Association). Visitors at the exhibition included CEOs, senior executives from industry, engineering companies, consultants, R&D professionals, manufacturers, technocrats, advisors, and policy makers. There were around 200 exhibitors, 50 overseas participants, and more than 100 000 global visitors at the exhibition. The event provided the Rajkot delegates with a great opportunity to learn about new technologies, products and services, share knowledge, and network with entrepreneurs and BDS providers from elsewhere in India and abroad.

Phoenix Products: a success story in promoting biomass gasifiers

Wood is widely used as a fuel in rural areas and in many industries (food processing, drying, and so on). However, the traditional wood-burning systems show poor thermal efficiency. Also, many industries use systems based on fossil fuels such as diesel and furnace oil, which are becoming increasingly costly, and therefore, eating into profits. We established Phoenix Products in Belgaum, Karnataka in 1989 with the aim to develop and promote biomass-based energy efficient systems that would help replace the existing low efficiency systems, particularly those based on fossil fuels, reduce fuel consumption and fuel expenditure, and offer the users attractive returns on their investment.

Today, Phoenix Products has become a leading manufacturer and exporter of biomass-based energy efficient devices. In 1993, we



Phoenix Products receives 'Best Tiny Industry Award'

received the award of 'Best Tiny Industries' from the Directorate of Industries and Commerce, Karnataka, presented by the then Chief Minister of Karnataka, Mr Veerappa Moily. We have developed a sound infrastructural base—a sophisticated manufacturing unit, an advanced quality control unit, a hi-tech R&D facility, and above all, a highly skilled workforce with a commitment to excellence. This enables us to develop and produce world class products for a growing Indian and international market. Our biomass-based products include insulated water heaters (hot water boilers), cook stoves, dryers, and biomass gasifiers for various thermal requirements.

Phoenix Products has been associated with TERI since 2007, and is manufacturing and installing TERI-design biomass gasifiers for a number of industries including food processing units (e.g. Shankar Guda's Puffed Rice Factory) and non-ferrous industries (e.g. SPM Extrusions Pvt Ltd for aluminium melting and billet heating). We have also participated in a number of awareness generation programmes organized by TERI to promote biomass gasifiers, for instance, in Govindram Seksaria Science College, Belgaum (July 2008), BVB College of Engineering and Technology, Hubli (November 2008), and Centre for Entrepreneurship Development of Karnataka, Dharwad (January 2009). In November 2009, Phoenix Products developed and installed a biomass gasifier at Ashok Iron Works Pvt Ltd., a foundry unit in Belgaum, for sand drying applications.

The foundry was earlier consuming close to 20 kg LPG per hour, at an estimated cost of Rs 800 /hour for drying sand. With the installation of the biomass gasifier, the foundry consumes around 80 kg firewood per hour at an estimated cost of Rs 240 /hour) for the same purpose. Thus, the foundry is saving around Rs 560 per hour or Rs 8960 per 16-hour day! This gives a payback period of less than 12 months on the cost of the gasifier.

Till now, Phoenix Products has developed and installed a total of 12 biomass gasifiers for thermal applications in various industries in Belgaum. The major attractions of the biomass gasifiers are low fuel costs, easy availability of fuel, no pollution, high combustion efficiency, and high output rate. Following the installation of biomass gasifiers, our clients are able to save around 40%–70% of their fuel costs.

Contribution by Sameer S Kanabargi
Phoenix Products, Belgaum

Firozabad shows the way: sustained uptake of energy efficient technology

In the earlier phase of the TERI-SDC partnership, project activities in the Firozabad glass industry cluster focused on strengthening the capacities of cluster-level service providers (local consultants, fabricators, masons, and so on). The aim was to enable entrepreneurs to adopt the energy efficient TERI-design pot furnace system without having to seek support from external agencies. This strategy, of setting in place cluster-level expertise for providing technical services and backup support, continues to serve as an example of how the uptake of clean, energy efficient



TERI design system at S Rajeev Glass

technology can be promoted and sustained in the long term. Four more pot furnace units in Firozabad have installed TERI-design systems between February and May 2010, namely, Patel Glass Works, New Jain Enterprises, S Rajeev Glass Works, and Meera Glass Works. All four are open pot furnace units (12 pots each) that melt glass for making bangles. The TERI-design system incorporates a highly efficient heat recovery device called ‘modular recuperator’, which yields fuel savings of around 30% compared to the conventional gas-fired pot furnace. Meera Glass Works has installed the TERI-design furnace system for the first time while S Rajeev Glass Works already had one TERI-design system in operation. Both Patel Glass Works and New Jain Enterprises earlier operated conventional gas-fired pot furnaces coupled with locally designed, relatively less efficient ‘pipe recuperators’ for waste heat recovery.

Two more open pot furnace units are in the process of adopting TERI-design systems. They are (1) Liberty Glass Works, a 12-pot unit that produces bangles, and (2) Renu Glass Works, a 10-pot unit producing glass rods and hollow tubes for making beads. In addition, three other pot furnace units have committed to switching over to the TERI-design recuperative system as soon as their existing conventional furnaces complete melting campaigns. One of these units has already initiated the procurement of materials for the new furnace system; it expects to commence furnace lining in June 2010.

Promoting energy efficiency in brick making in north-eastern India

A cluster-level meeting on ‘Energy efficiency improvements in the brick industry’ was organized in Agartala, Tripura on 18 June 2010 by TERI and Tripura State Council of Science and Technology (TSCST) under the UNDP–GEF project, which aims to increase energy efficiency in the Indian brick industry. TERI is a ‘Responsible Partner’ for implementing the project, and TSCST is the local resource centre (LRC) for the north-eastern region. The event was attended by

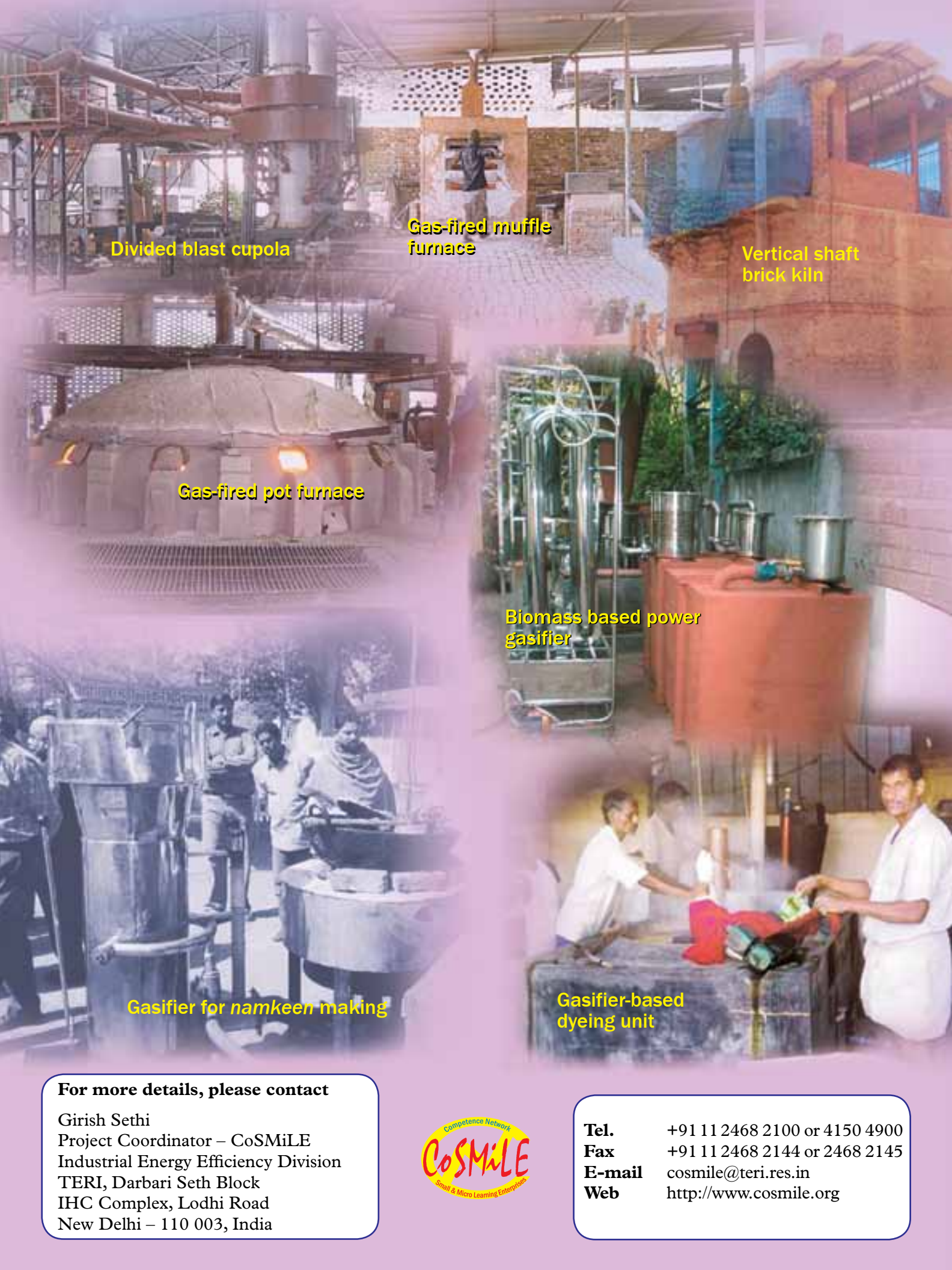
about 30 brick entrepreneurs from the region. The meeting was chaired by Mr Joy Gobinda Debray, Minister of Science, Technology, and Environment (STE), Government of Tripura, and Mr Sriram Taranikanti, Commissioner and Secretary, STE was the special guest.

TERI highlighted the difficulties faced by the traditional brick kiln units, which continue to depend on largely manual technologies to make resource-intensive fireclay bricks, even as skilled labour is becoming scarce. In this situation, there is a need as well as an opportunity for brick entrepreneurs to switch over to making REBs, which offer numerous benefits in the form of energy savings of up to 20%, reduced consumption of topsoil (about 30%), superior quality of fired products, reduction in construction costs (5%–7%), and reduced cooling/heating load requirements (close to 5%).

Under the project, TERI could assist entrepreneurs in switching over to REB production by facilitating demonstrations of REB technology, building capacities of workers/operators in the new technologies, developing linkages with banks and other financial institutions, and creating and expanding markets for the new/improved products.

Mr Bijan Saha, Branch Manager, North Eastern Development Finance Corporation (NEDFI) described the range of financial services offered by NEDFI to support the expansion, modernization, and diversification of existing SME units as well as to fund new projects. Notably, NEDFI provides financial support for exposure visits and skills upgradation under its ‘Scheme for development of entrepreneurial skills and market for North East products’.

Mr A K Bannerjee of Walter Craven Ceramic Products Ltd, Kolkata—a leading supplier of REB technology—spoke on various machineries and equipment used in REB manufacture. He further elaborated on the characteristics and applications of different REB products. The event concluded with a lively discussion among the participants on various aspects of REB technology and the opportunities that exist for entrepreneurs in the North East.



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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