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A platform for learning and action for small and micro enterprises

Editorial

The small-scale sector occupies a prominent position in the Indian economy. It contributes around 45% of manufacturing output, 40% of exports and employs more than 40 million people. Since independence, the government has formulated various policies and schemes to promote the growth and development of small-scale industries. The Micro, Small and Medium Enterprises Act, 2006 is a recent legislation that seeks to facilitate the development of small enterprises and enhance their competitiveness. The Ministry of MSME (Micro, Small and Medium Enterprises) is the nodal ministry for implementation of this Act through various measures, including development of specific schemes/programmes for promotion and development of small enterprises. The ministry is now looking at integrating energy-related aspects into some of its existing schemes, as it is increasingly being recognized that non-availability of reliable power supply and high cost of energy are impacting the competitiveness of many small-scale industries. This is especially true of energy-intensive small-scale industry clusters, where energy forms a major component of the cost of production.

TERI, with the support of SDC (Swiss Agency for Development and Cooperation), initiated activities almost a decade ago to provide support to some energy-intensive industry clusters by developing, demonstrating and disseminating energy efficient technologies. Good progress has been made, as is evident in the Firozabad glass industry cluster, Howrah foundry cluster and Rajkot diesel engine cluster. However, a lot more needs to be done, in terms of building local support structures and innovative replication models in these clusters, if the benefits of efficient technologies are to percolate to more units.

There are a large number of other energy-intensive clusters in the country where such technology development and dissemination programmes can be facilitated. TERI recently undertook an in-house review of the list of 393 manufacturing (industry) clusters in India (a list provided by Foundation for MSME Clusters and being widely used by various agencies dealing with MSMEs) and classified them into 12 product categories based on their energy intensity and probable energy saving potential. The review revealed that there are at least 178 clusters that are energy-intensive and may have a high or medium level of energy saving potential. These clusters fall under broad product categories like castings and forging, glass and ceramics, food processing, etc. Significantly, the review revealed that many energy-intensive small-scale sectors do not figure among the identified clusters—a typical example being the brick industry. The exercise also highlighted the limited nature of the existing knowledge base on energy consumption patterns in the Indian small-scale industry as a whole. The BEE (Bureau of Energy Efficiency) has taken a small step to address this challenge by planning a situation analysis of 35 SME clusters in the country. This exercise is a part of a larger BEE-SME programme, in which TERI is providing support to BEE.

A comprehensive assessment of energy usage pattern in the MSME sector is a daunting task. Nevertheless, it is important at least to initiate activities in some of the highly energy-intensive clusters. In order to enable the small-scale industry to move towards an energy-efficient pathway, it is vital to develop long-term cluster-specific programmes for adoption of energy-efficient and environment-friendly technologies, tailor-made to suit the needs of the local industry. The broader objective should be to develop supportive conditions, contribute to innovations, and provide new, cleaner technological solutions in the MSME sector-leading to energy conservation and reduced impact on global climate.

Girish Sethi

Director, Industrial Energy Efficiency, TERI

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The Energy and Resources Institute



Cluster development workshop

A workshop on 'Thematic issues in cluster development' was jointly organized by TERI and the Foundation for MSME Clusters on 17 April 2008 at New Delhi. Besides SDC and TERI, the participants included representatives from the government, small and medium industry associations, research institutions, and NGOs.

The first session of the workshop focused on development of MSME (micro, small and medium enterprises) clusters vis-à-vis poverty reduction. It outlined the challenges confronting the MSME sector, described initiatives taken by the Ministry of MSME for cluster development, and explained the methodology by which cluster development could bring about poverty reduction. Case studies were presented to show how cluster development initiatives were helping to bring about positive socio-economic change. These included initiatives taken by the Orissa government in the handloom sector; by UNIDO (United Nations Industrial Development Organization) in various MSME clusters in Orissa; and by Titan Industries Ltd and MYRADA (Mysore Rural Area Development Agency) to provide income generation opportunities for women in rural Karnataka and Tamil Nadu. The speakers in this session included the following.

- Mr Mukesh Gulati, Executive Director, Foundation for MSME Clusters
- Mr Sesh Kumar Pulipaka, Joint Secretary, Ministry of MSME
- Mr Philippe Scholtes, Regional Director, UNIDO
- Prof. Shovan Ray, Indira Gandhi Institute for Development Research, Mumbai
- Ms Anita Agnihotri, Commissioner-cum-Secretary, Government of Orissa
- Mr Shivarudrappa, Project Coordinator of MYRADA

The second session focused on energy issues at cluster level, in particular, the challenge of providing MSME clusters with energy security through access to dependable power sources and energy-efficient technologies. Mr Adrian Marti, Deputy Country Director, SDC, stressed the need for 'out-of-box thinking' in addressing these challenges.

Mr Rajiv Garg, Energy Economist, BEE (Bureau of Energy Efficiency), described a programme being developed by BEE to promote energy-efficient technology in 35 MSME clusters across India. The programme will involve widening BEE's own knowledge base of the MSME sector; market development activities; financial support; and competence/resource pooling.

Mr Girish Sethi, Director, TERI, shared the experiences and lessons gained by TERI while

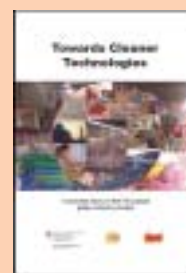
Book release: TERI's efforts in Firozabad glass cluster

TERI has published a book titled *Towards Cleaner Technologies: a process story in the Firozabad glass industry cluster*, which was formally released by Mr Jawhar Sircar, Additional Secretary and DC (MSME), Ministry of MSME, during the workshop on 'Thematic issues in cluster development' organized on 17 April 2008 in New Delhi.

The book describes the process by which TERI, with support from SDC, developed and demonstrated two clean, energy efficient technologies for the small-scale glass units in the Firozabad glass industry cluster: the natural gas-fired recuperative pot furnace, and the natural gas-fired muffle furnace. In particular, it highlights the experiences of project staff and other stakeholders, and the challenges faced and tackled by them in the course of their work.

The book is the third in a series of process documents on interventions by TERI and SDC in the Indian SMiE (small and micro enterprises) sector. It is primarily intended as a guide for researchers, policy-makers, NGOs, donor organizations, academic institutions, and others involved in the SMiE sector.

A copy of the book may be downloaded from <<http://www.cosmile.org/doc/glassbookapril08.pdf>>



promoting energy-efficient technologies in the Firozabad glass cluster. Participants were also shown a video capsule titled 'Changing the convention', which captures TERI's work in Firozabad and highlights future challenges in this cluster. Mr A K Goel, Director (PS), PCRA (Petroleum Conservation Research Association), outlined the initiatives taken by the PCRA in the Khurja pottery cluster. Dr Arun Kumar, President, DA (Development Alternatives) described DA's experience in promoting the VSBK (vertical shaft brick kiln) and suggested that improved technologies can be promoted more effectively through 'post-performance' incentives (such as carbon credits) than by upfront 'one-off' subsidies.

Providing a cluster perspective on energy-related issues, Mr Rajiv Chawla, President, Faridabad Small Industries Association, described how the Faridabad MSME cluster is growing at a phenomenal rate (it has over 18000 units), yet faces severe power shortage that threatens the future of the cluster. He emphasized the urgent need for energy solutions that are economically viable for entrepreneurs. *'Often, there is a huge gap between what the policy-makers, wants me to do and what the entrepreneurs are capable or willing to do.'* Mr L Pugazhenthay, Vice President and Chairman, Non-Ferrous Division, Indian Institute of Metals, cited examples from the metal industry to highlight drawbacks in framing and implementing regulations related to the MSME sector. *'The more you regulate, the more there is violation! The answer is to minimize regulations...instead, to find change agents at cluster levels; young energy and technology specialists who can work with units and help them get benefits through energy efficiency.'*

In his valedictory address, Mr Jawahar Sircar, Additional Secretary and Development Commissioner (MSME), Ministry of MSME, acknowledged that the impact of government schemes for cluster development had been limited, and that a major challenge for the future is to address units at the 'bottom of the pyramid' as highlighted by the TERI film on the Firozabad glass cluster. He also released a book brought out by TERI on its intervention in the Firozabad glass cluster.

Promoting solidarity among firemen in eastern Uttar Pradesh

Lokmitra organized a meeting in Rae Bareilly on 1 May 2008 to enhance awareness among firemen and other working communities in eastern Uttar Pradesh of their benefits and rights under government-sponsored schemes such as NREGS (National Rural Employment Guarantee Scheme). The event was attended by representatives of three community forums: (1) Bhatta Parivar Takniki Samaj Sangh, representing the firemen community; (2) Nishad Sangh, representing the community of traditional fishermen; and (3) Abhibhavak Sangh, a forum of parents and guardians.

Lokmitra explained the rights and entitlements available to the rural poor under the NREGS. Firemen *sanghatan* leaders Mr Badri Prasad and Mr Shivram described the arduous conditions under which the firemen worked at the kilns, their inability to find employment during the off-season months, and the difficulties their family members faced in obtaining jobs under the NREGS and other government schemes. Mr Ram Bahadur of Nishad Sangh spoke on how members of his community depended for their livelihood on fishing and small-scale agriculture. Today, these traditional occupations are insufficient to sustain families; yet, community members find it a challenge to obtain employment under NREGS and similar schemes.

The participants agreed on the need for unity among all workers' communities for the common good and announced the formation of the 'NREGA Mazdoor Manch'. This forum will monitor various development works undertaken under the NREGS and other schemes, and thereby ensure fairness, effectiveness, and transparency in implementation of these panchayat-level schemes. The meeting concluded with the three forums presenting a list of their demands to the Chief Development Officer, Rae Bareilly.

Technical support for two new VSBKs in southern India

A twin-shaft VSBK (vertical shaft brick kiln) was commissioned at Cuddalore, Tamil Nadu, on 23 April 2008, with technical support from TERI.



View of soft mud moulding machine

The kiln produced close to 100 000 bricks on single-shaft operation till 24 May 2008, when it was stopped due to rain. The kiln was restarted on 30 June 2008. It uses hand-moulded bricks, as well as bricks made from a soft-mud-moulding machine.

TERI is also providing advisory and technical support for a new entrepreneur-owned VSBK at Karaikal, Tamil Nadu. Construction of the kiln began in the last week of June 2008. The salient features of this 1 metre × 2 metre twin-shaft kiln include a soft mud moulding machine for making green bricks and an electric winch to lift green bricks to the loading platform.

World Bioenergy 2008: conference on biomass energy

TERI participated in 'World Bioenergy 2008', a conference-cum-trade fair on biomass energy, held in the city of Jönköping, Sweden, during 27–29 May 2008. This biennial event brought together manufacturers, policy-makers, and other stakeholders in biomass energy from across the globe to foster cooperation and information exchange between countries that have national programmes in biomass energy research, development, and deployment. The event was organized by SVEBIO (Swedish Bioenergy Association) and Elmia AB, one of Europe's foremost exhibition centres. It was supported by many international organizations, public and private, including the Ministry of Enterprise, Energy and Communications, Sweden; Swedish Energy Agency; Bioenergy Australia; the US Department of Commerce; DANBIO (Danish

Biomass Association and Danish Biogas Plant Association); and IEA Bioenergy.

As part of the conference, the Stockholm Environment Institute organized a forum on biofuels for development in Africa. TERI made a presentation on its pilot activities to promote biomass energy technologies in Uganda with support from the World Bank under the ERT (Energy for Rural Transformation) programme of the Ugandan government. TERI's work in Uganda is of particular significance, given the fact that sub-Saharan Africa has the world's largest potential for the use of biomass energy.

World Bioenergy 2008 underlined the growing significance of biomass energy in an era of skyrocketing fossil fuel prices and increasing concerns about climate change. Over 1200 delegates from 60-odd countries participated in the conference, and around 200 companies exhibited their products at the trade fair.

A large number of innovative biomass-based technologies were presented during the event. These included a car that runs on biomass pellets; a new kind of combustion chamber that can convert a variety of dry and fresh manures into energy; special planting machines for use in energy plantations; and a method to make bio-diesel from restaurant and slaughterhouse wastes.

Participants were also taken on a study visit to a new biogas plant in Jönköping that annually produces 600 000 m³ of biogas from sewage sludge. [For details see <http://www.elmia.se/en/World-Bioenergy/>]



Car that runs on biomass pellets

Promoting biomass gasifier systems in Uganda

TERI's activities in Uganda are aimed at demonstrating the technical and commercial feasibility of biomass gasifier systems for thermal and power applications; identifying barriers to the spread of gasifier systems, and developing solutions to overcome these barriers; designing and setting up a testing facility for gasifier systems using locally available agro-waste materials such as coffee husk, rice husk, saw dust, etc.; and building the capacities of local technicians and engineers in biomass gasifier technology. TERI is conducting four pilot projects in Uganda under the ERT-World Bank programme.

- 1 A 150 kW_e wood-based gasifier system is being set up at Nyabyeya Forestry College to meet the electricity needs of the entire college campus.
- 2 A 30 kW_{th} (25000 kcal/hour) wood-based gasifier system for large-scale cooking is being set up in the kitchen of King's College, Budo.
- 3 A 100% biomass gasifier-based power plant is being set up at Kyambogo University for demonstration and training purposes.
- 4 A study is being conducted for the electrification of Kalangala Island (on Lake Victoria) through the use of gasification technology.

Public-private initiative to combat climate change: workshop on Howrah foundry cluster

On 27 June 2008, TERI participated in a workshop in Kolkata titled 'Managing climate change: clean technology solutions for Howrah foundry and castings cluster'. The workshop was organized by TIFAC (Technology Information Forecasting and Assessment Council) and Jadavpur University under a joint initiative by the MoST (Ministry of Science and Technology) and HSBC to facilitate action to combat climate change through exchange of knowledge between industry, civil society organizations, government, and the general public.

The participants comprised entrepreneurs, industry associations, academicians, and representatives of R&D institutions and NGOs. They included Prof. Anand Patwardhan, Executive Director, TIFAC; Mr Yenten Lama, HSBC India; Dr Placid Rodriguez, President, Indian Nuclear Society; and Prof. Pradip Narayan Ghosh, Vice-Chancellor, Jadavpur University. The presentations and discussions during the workshop focused on the following topics related to the Howrah foundry cluster:

- Energy-related problems faced by foundry units
- Clean and energy-efficient technological options available for units
- Benefits of these new technologies in terms of fuel savings and reduced emissions

TERI made a presentation on two technologies developed and demonstrated in the Howrah cluster: the energy-efficient DBC (divided blast cupola) for melting metal, and the venturi scrubber to reduce SPM (suspended particulate matter) emissions from stack. The presentation included a case study on 'bundling' of foundry units in the Belgaum foundry cluster (Karnataka) to avail of benefits under the CDM (Clean Development Mechanism) route. It also elaborated the success of its (ongoing) efforts to disseminate these technologies in other foundry clusters in India, for example, Rajkot and Ahmedabad.

It is hoped that this workshop and other similar events that will follow under the joint HSBC-MoST initiative will create an increasingly informed environment on climate change issues among various stakeholders and help in adoption of clean, energy-efficient technologies in the foundry sector.

PCRA support to promote DBCs in Ahmedabad foundry cluster

TERI has obtained support from PCRA (Petroleum Conservation Research Association) to initiate replications of DBC (divided blast cupola) technology among small-scale foundry units in Ahmedabad. The project will be implemented in partnership with the Ahmedabad Foundry Cluster and GITCO (Gujarat Industrial and Technical Consultancy Organization Ltd). Most units in this cluster use small cupolas (18-inch diameter), and

there is considerable scope to bring about energy savings by replacing the existing cupolas with energy-efficient DBCs of similar size. Under the project, TERI will design, develop and demonstrate the 18-inch DBC at four foundry units in the Ahmedabad foundry cluster. TERI is working with the local foundry associations to identify the demonstration sites. Efforts will also be made to disseminate the new DBC design by involving various stakeholders.

Knowledge management workshop: evolving a strategy for brick sector

TERI organized a workshop on 'Knowledge management in community for brick sector' during 9–10 June 2008 at the RETREAT campus, TERI. The programme was attended by TERI, PEPUS, Lokmitra, Vidya Ashram, and SDC. The event was moderated by two resource persons: Dr Kavi Mahesh, Principal Consultant,



Knowledge Management Group, Infosys Technologies Ltd, and Mr V Vivekanandan, Advisor, SIFFS (South Indian Federation of Fishermen Societies, Trivandrum). The event had two primary objectives:

- To obtain an understanding of the theory and practices of KM (knowledge management)
- To apply this understanding to evolve a strategy for future activities in the brick sector – specifically among the firemen community in eastern Uttar Pradesh – based on knowledge management

Technology evolution: challenges and lessons in adaptation

Many challenges have to be overcome while trying to bring about technological change among traditional artisan communities. Mr V Vivekanandan described these challenges through anecdotes in the course of the workshop. Some of his observations:

'Artisanal technologies are specific to local contexts, and nature plays a key role in determining them among artisan communities like fishermen. This fact must be kept in mind while attempting to introduce changes in artisanal technology. For instance, in and around Mumbai the tidal variations are large but the sea is usually calm. Hence, fishermen in this region use big boats and venture quite far out to sea. However, around Kanyakumari the seas are much rougher, with huge waves. So, the fishermen in this region use the lightweight one-man catamaran and stay close to the coastline.'

'In evolving new technologies, it's vital to understand traditional practices and to involve the community as much as possible. The key is to generate trust. It took extensive interactions with the fishermen to persuade them to try out boats made of new materials like plywood, instead of their traditional catamarans made from logs.'

'It's also important to remain flexible during technology development, because everything cannot be learned in advance. The first plywood boat we designed had a hollowed-out shape that would allow the fishermen to sit comfortably in it and fish—or so we thought. But the fishermen did not like this design—because in their catamarans they are accustomed to standing while fishing! So, we changed the boat design to give it a flat bottom like the catamaran. Later, we motorized the boats in response to demands from the fishermen, who felt that this would help them compete with the large mechanized trawlers. Thus, while evolving the boat design we have changed certain things to suit the fishermen...and they have changed certain traditions to meet the new circumstances. Today, there are over 50,000 boats designed by SIFFS plying in the seas around Kanyakumari.'

'Sharing knowledge brings great benefits. In Kerala, fishermen have traditionally used nets to catch bottom-resting prawns near the coastline. However, Mozambique had no such tradition, and hence foreign vessels were being allowed to trawl prawns as close as one kilometer away from Mozambique's shores. All this changed when a government delegation from Mozambique saw Kerala's prawn fishermen at work. Now, our fishermen are teaching Mozambique fishermen how to catch prawns.'

At the outset, TERI made a presentation on its activities in the brick sector since 1993, in particular its initiative among the firemen community in eastern Uttar Pradesh under the approach known as TSI (techno-social integration). TERI described how the concept of *sanghatan* (collective) has been promoted among villagers to foster cooperative action and solidarity, and how, through technical and social capacity-building programmes, the *sanghatan* is evolving from a mass organization to a 'knowledge organization' that pools the wisdom and strengths of the firemen community. There is, hence, a need to apply the principles of KM while planning future activities in the brick sector.

Dr Mahesh outlined the fundamental principles and ideas of KM in his presentation titled 'Knowledge management in society, community and the informal sector'. He defined KM as '*Connecting knowledge needs with knowledge sources in a given set of contexts*' and stressed its importance in today's highly competitive, globalized environment, where rapid changes in technology are threatening traditional means of livelihood and have made knowledge a factor of production (in addition to land, labour and capital).

Mr Mahesh set out the principal steps in KM as follows.

- Define KM objectives.
- Create a 'knowledge map', that is, clearly identify the knowledge needs and the knowledge sources.

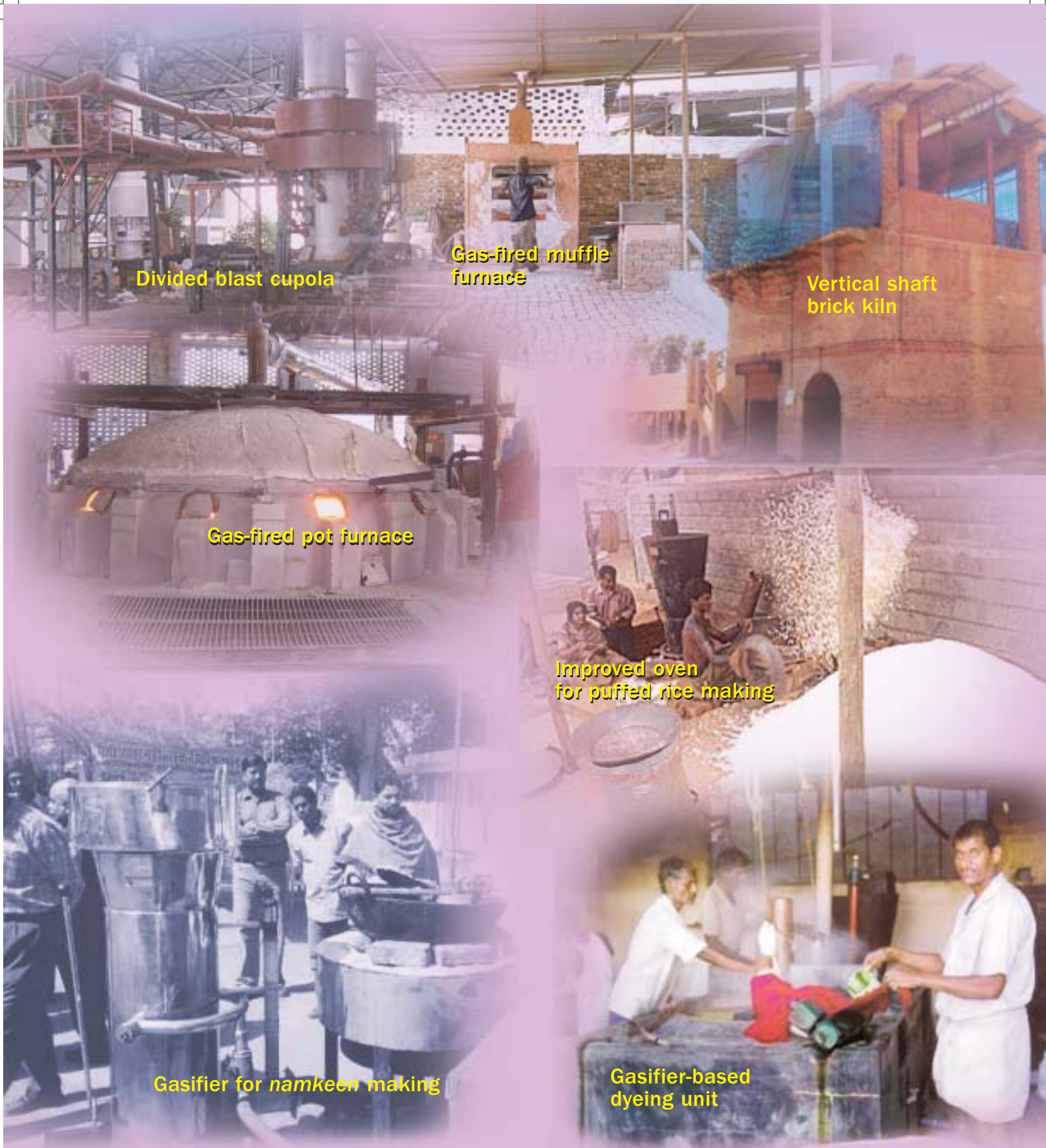
- Design solution (match needs with sources optimally).
- Implement the solution incrementally (the KM process cannot be rushed).
- Measure and assess progress on an ongoing basis.

Mr Vivekanandan provided insights from his 25 years of work with the fishermen communities of southern India, which helped in drawing lessons for the project work among the firemen community. The fishermen communities, too, follow traditional practices that have remained unchanged for centuries. They have a wealth of traditional knowledge (lures, lines and nets, tides, shoal movements, etc.) but it is undocumented; they live and work in conditions of great hardship; their traditional catamarans (boats with twin hulls, made from four logs strapped together) face intense competition – in the seas as well as in the markets – from the mechanized fishing vessels that have proliferated since the 1970s. Mr Vivekanandan described how, aided by the patient efforts of NGOs and other agencies in both technological and social fields, the fishermen communities are finding innovative ways to adapt to the new circumstances. He stressed the importance of community participation in finding solutions. '*Innovation does not come about through project intervention...it comes from the fishermen alone, or through market forces.*'

Events calendar

- 1 One-day awareness programme on Modern Biomass Energy Technologies, 9 July 2008, in Belgaum, in association with Govindram Seksaria Science College, Belgaum
- 2 Anchor team training to promote modern biomass energy technologies, 21–25 July 2008, at MGIRED, Bangalore.
- 3 Consultative meeting with Ahmedabad Foundry Association and GITCO (Gujarat Industrial and Technical Consultancy Organization Ltd), Ahmedabad, July 2008.

The meeting is aimed at selecting suitable demonstration units for small-sized DBCs in the Ahmedabad foundry cluster for the PCRA-supported project.
- 4 Meeting of Worker-Owner Forum at Howrah foundry cluster, being organized by the IMSE (Institute for Motivating Self-Employment), Howrah, August 2008.
- 5 Technical dialogue with foundry owners in Howrah cluster, August 2008.



Divided blast cupola

Gas-fired muffle furnace

Vertical shaft brick kiln

Gas-fired pot furnace

Improved oven for puffed rice making

Gasifier for namkeen making

Gasifier-based dyeing unit

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