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

## Editorial

Annamarije Kooijman, a PhD student from the University of Twente, Netherlands, made a presentation on 'the role of energy on rural non-farm income generation' at SDC, Delhi, on 13 February 2008, based on her extensive fieldwork in Himachal Pradesh, Darjeeling and Uttarakhand. Both the presentation and the ensuing discussions (posted at [www.hedon.info](http://www.hedon.info)) pointed to one major conclusion: access to modern energy does not automatically lead to increase in income generation in rural areas in the short run. The other important conclusion is that access to markets and easy finance, and to physical infrastructure such as roads, is far more important than energy in the hilly areas studied, and probably in similarly located remote villages.

In general, in rural areas where only 4%–14% of the households are involved in non-farm entrepreneurship, creating an elaborate infrastructure for modern energy access may not yield the desired results—at least in the near future. Many people argue that there could be a substantial lag time, say 8–10 years, between establishing access and using electricity for income generation activities. Major efforts are being made to electrify remote areas, chiefly by the MoP (Ministry of Power) and MNRE (Ministry of New and Renewable Energy). The MoP is focusing more on extending the grid, while the MNRE is trying to use RE (renewable energy) for remote village electrification. However, two questions frequently pop up: (1) What is the utility of the extended grid if there are many power shortages? (2) Why invest heavily in the RE-based DDG (decentralized distributed generation) when the grid will ultimately reach everywhere?

There are no simple answers. DDG units, which primarily provide lighting, are not likely to spur economic growth in remote villages in the short run. The supposedly cheaper grid extension is also not likely to do better, as shown by Annamarije's work. The most crucial task—to be done first at the thinking level—is to find ways and means by which DDG and grids can work harmoniously in tandem. There are cases where PV (photovoltaic) panels are not removed or where gasifier power plants are restarted even after the grid reaches the villages. In such cases, the RE systems are seen as 'fall-back' options. Why not consider RE systems as necessities at present for a better quality of life, and as means for economic development in later years, for the remote areas?

The situation is quite different if we consider the cases of SMiEs (small and micro enterprises) reeling under frequent and prolonged power cuts. Clusters of small textile mills, electroplating units, and carpet weaving units (to name only a few) either suffer loss of production or incur high costs on diesel gensets. Both reduce the economic competence of units. These cases are the opposite of those studied by Annamarije. They are productive users of energy with access to market, finance, and so on; but they lack electricity. Why not consider RE options like biomass gasifiers for such cases if feasible? There are several examples in Bihar and West Bengal where rice husk-fuelled gasifier systems are proving to be viable compared to diesel gensets. A small cluster of SMiEs, served by a suitably sized gasifier power plant, could be a viable option. Many hurdles would have to be crossed for such a configuration, coming from many quarters such as regulation, biomass linkages, financing, and technology adaptation; but none are too daunting to solve. What is primarily needed is a change in mindset about the compatibility between DDGs and grids, and a realization of the potential of RE-based small power for India.

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The Energy and Resources Institute



## Creating awareness about carbon credits for SMiEs: paper presented at World Foundry Congress

One of the objectives of CoSMiLE is to create awareness among SMiEs of how, by adopting clean, energy-efficient technologies, SMiEs may reap additional financial benefits through the sale of 'carbon credits' under the CDM (Clean Development Mechanism). Towards this, the TERI team, along with Mr S H Arjunwadkar, Chairman of NCST (National Centre for Technical Services, Institute of Indian Foundrymen), presented a paper titled 'Energy savings and carbon credits: opportunities and challenges for the Indian foundry industry' at the Plenary Session of the prestigious World Foundry Congress in Chennai on 7 February 2008.

The paper highlighted major options to reduce energy consumption in various melting furnaces. It also gave an overview of what carbon credits are, and how a foundry unit could seek additional income by selling the carbon it had 'saved' through reduced energy consumption. Finally, the paper discussed an actual CDM project for foundry units in Belgaum, Karnataka, and the barriers to implementing similar projects among foundry clusters elsewhere.

The TERI-NCST paper was adjudged among the best three papers presented at the Congress. The award was announced during the valedictory session of the Congress by the selection committee headed by Mr Andrew Turner, Secretary General, World Foundry Organization.

## Spreading the word

The interventions under CoSMiLE, in various small and micro enterprise sub-sectors have significantly improved energy efficiency and reduced greenhouse gas emissions, and also helped bring about social and economic benefits to both owners and workers. As part of its ongoing efforts to share the knowledge and experiences gained from these

interventions, TERI brought out the following publications in the first quarter of 2008.

- *Proceedings of workshop on dissemination of learnings of CoSMiLE* As the title indicates, this book presents the proceedings of the workshop organized by the project at Bangalore from 21–22 November 2007 with support from the Department of Industries and Commerce, Government of Karnataka. It describes the experiences of the project team in different small and micro enterprise sectors, including biomass gasifiers, brick-making and foundries. The book will be of interest to industry owners, policy-makers, NGOs, academic institutions, and other stakeholders in the small and micro enterprise sector.
- *Reaching out to the puffed rice units* This booklet describes the initiative by TERI and its partners – BVB College of Engineering Technology (Hubli), SDM College of Engineering and Technology (Dharwad), and NGOs Sadhana and PGAMS – to develop low-cost and sustainable techno-social solutions in the puffed rice clusters of Hubli, Dharwad, Ranebennur, and Davanagere. The booklet gives a detailed account of the present conditions in these clusters in terms of technology, energy, and environmental conditions, and describes how TERI developed a basket of technologies for puffed rice units: some to reduce pollution and improve the working environment, and others to increase energy efficiency. These technologies include an improved oven with a heat recovery unit, a dust arrestor that reduces SPM (suspended particulate matter) emissions, and a fuel-efficient gasifier-based improved oven which gives a pollution-free environment for workers.
- *Clean energies for the silk sector* This booklet summarizes the initiative by TERI to design, develop, and promote clean, energy-efficient biomass gasifier technology for use by small-scale silk dyeing units in Bangalore.

For more details please visit  
<<http://www.cosmile.org>>

## TERI-ITEC training programme

TERI has been empanelled as a training institute by the Ministry of External Affairs, Government of India, under two programmes to enhance cooperation among developing countries: ITEC (Indian Technical and Economic Cooperation Programme), and SCAAP (Special Commonwealth Assistance for Africa Programme). Under the ITEC Civilian Training Programme for the year 2007/08, TERI organized a three-week training programme on 'Renewable Energy and Energy Efficiency (REEE)' from 18 February 2008 to 7 March 2008.

Participants from developing countries were chosen for the programme with academic qualifications in the fields of science and/or engineering, and at least five years' work experience in government, private/public sector organizations, or chambers of commerce and industry. In all, 28 participants were chosen from Africa and Asia as under:

- SCAAP countries—Zambia, Nigeria, Tanzania, Uganda, Mauritius

### *Exposure visit to Firozabad glass cluster*

On 28 February 2008, TERI took the participants to the Firozabad glass industry cluster located near Agra. The group visited Babu Glass Industries and saw the energy-efficient natural gas fired pot furnace designed by TERI, used to produce molten glass for bangle-making. The proprietor of the unit, Mr Lalitesh Kumar enthusiastically endorsed the benefits and energy savings brought by the TERI-designed furnace. The participants also saw an automatic tank furnace in the same unit, used to produce container glass.

- ITEC (Indian Technical and Economic Cooperation) countries—Afghanistan, Ethiopia, Indonesia, Jordan, Kazakhstan, Lao DPR, Malaysia, Sudan, Uzbekistan

The REEE training programme was conducted in three modules. The first module was conducted at TERI's in-house facility at Gwal



Participants during the TERI-ITEC training programme



Pahari, Haryana, from 18–24 February 2008. The module focused on renewable energy (solar–thermal, photovoltaic, wind, biomass, small hydro) and related policy issues. Participants were taken around the facility to give them a better understanding of renewable energy technologies and energy-efficiency techniques that they experienced during their stay. The module included a one-day training session on RETScreen – a software tool used for analysis of renewable energy projects. The participants obtained hands-on experience with the software through a group exercise. Each participant took his/her own country as a case study, thereby making the exercise more meaningful and effective.

The second module comprised field visits from 23–29 February 2008 to various renewable energy facilities and energy-efficient plants in north India. On 23 February, the participants visited the solar concentrating collector system and SPV (solar photovoltaic) power plant being used for large-scale cooking in the Brahma Kumaris Ashram in Gurgaon, Haryana. On 25 February, they visited the Solar Energy Centre (of the Ministry of New and Renewable Energy) and the SPV-R&D Centre (of Bharat Heavy Electricals Ltd) at Gual Pahari. On 26–27 February, they visited a biomass gasifier manufacturing factory at Yamunanagar (Haryana) and field installations of thermal and power gasifier systems in nearby areas. On 28–29 February, the participants visited the Firozabad glass cluster and saw the energy-efficient glass melting pot furnace developed by TERI.

The third module was conducted at TERI's Southern Regional Centre, Bangalore from 3–7 March 2008. It focused on energy efficiency and energy conservation techniques in small-scale industries. With the help of energy audit case studies, participants learned how these techniques could be utilized for different thermal and electrical applications. They also visited the Tata BP Solar Plant and CPRI (Central Power Research Institute). The REEE training programme has evoked an encouraging response. Participants from Zambia and Tanzania have shown interest in undertaking initiatives in renewable energy. Participants from Nigeria have expressed

interest in improving energy efficiency, and in using biomass gasifiers for industrial applications.

A similar ITEC-REEE programme will be organized during January 2009.

### **Gyan Chaupal: seeding change through informal interactions**

In an attempt to facilitate knowledge-sharing among the firemen community, CoSMiLE is promoting the concept of Gyan Chaupal (literally, 'knowledge forum'). This is essentially an informal gathering of community members at a common place to discuss matters of mutual interest and share information and experience. So far, three such Gyan Chaupals have been formed at Kaurihar block in Allahabad district of Uttar Pradesh.

PEPUS, one of the NGO partners, conducts monthly meetings of these Gyan Chaupals, in which men and women from 10 to 15 villages regularly participate. These informal meetings discuss various topics: social issues related to their villages, technical matters pertaining to the firemen's work at the brick kilns, sangathan issues, livelihood opportunities, and so on.

The project is optimistic that the Gyan Chaupal initiative will gain wider acceptance among the firemen community, and that it will help community members take initiatives based on their shared knowledge and interests to bring about positive socio-economic change in their lives.



*Gyan Chaupal in progress*

## Jamera power gasifier: exposure visit for Swiss Mission

In February 2005, TERI set up a biomass-based power gasifier (2 × 10 kW) in Jamera—a small, remotely located village in Chhattisgarh—with the support of NTPC (National Thermal Power Corporation). The gasifier system has been running successfully since inception. It meets both the domestic and community lighting needs of the villagers (dwellings, street, school room, and so on) and has dramatically improved the quality of life.

In the last week of March 2008, TERI organized an exposure visit to the Jamera gasifier for representatives of the Swiss mission to India. The team included Mr Christopher Graf, Head, South Asia Division and Mr Jean-Bernard Dubois, Deputy Head, Natural Resources and Environment from SDC Berne; and Dr Veena Joshi, Team Leader, SDC Delhi. The visitors were impressed by the benefits brought about by the power gasifier, and extremely appreciative of the fact that TERI had successfully installed this system in such a remotely located village. They felt that there was a need for further technological upgradation to make such systems safer, more reliable, and operator-friendly, in order to accelerate their replication.

Furthermore, though extension of the grid is being planned to all the non-electrified villages under the RGGVY (Rajiv Gandhi Grameen Vidyutikaran Yojna), this will not



Swiss mission on field visit to Jamera

make distributed generation (or DG) obsolete; rather, grid extension will work in favour of DG technologies because then these DG systems can even start feeding grids, including strengthening the tail-ends. Towards this, it is essential that DG systems are compatible with grids. The Mission also felt that this is one area where there are opportunities for South-South cooperation.

## Promoting energy savings in the food processing industry: SIDBI-supported project

The fruit and vegetable processing units located in and around Pune constitute an important food processing cluster in India. These units are engaged in basic fruit and vegetable processing, and also prepare a range of products such as spices, pickles, and ready-to-eat/ready-to-cook (RTE/RTC) products. Energy is an important input in this sector. However, a large number of these units use energy inefficiently. There is considerable scope to improve their energy performance by adoption of better technologies/equipment and through good housekeeping. In order to create and enhance awareness on simple and affordable energy conservation opportunities among these industries, TERI has taken up preparation of a 'Dos and Don'ts' booklet, under a project being supported by SIDBI (Small Industries Development Bank of India).

TERI will conduct a 'walk-through audit' for making a diagnostic assessment of a few representative units in the Pune cluster. It will also organize a workshop for the benefit of the cluster involving various stakeholders. A simple set of 'Dos and Don'ts' tips will be framed in the form of a booklet to guide the units on various ways to conserve energy.

## Knowledge-sharing workshop on cleaner technologies for puffed rice sector

Continuing its efforts to replicate the clean, biomass gasifier-based technologies developed for puffed rice units in south India, TERI



Demonstration of gasifier in a puffed rice unit

organized a workshop Titled 'Knowledge-sharing workshop on cleaner technologies in puffed rice sector' in the Ranebennur puffed rice cluster on 29 February 2008 in association with PGAMSS (Paripoorna Grameena Abhivradhi Mahila Seva Sangha). More than 70 participants attended the programme, including owners and the workers of puffed rice units. The speakers were drawn from KCTU (Karnataka Council for Technical Upgradation), KVG Bank (Karnataka Vikas Grameena Bank), BVBCET (B V B College of Engineering and Technology) and VEE (Vijay Engineering Enterprises).

The workshop comprised sessions on technologies and banking facilities available for puffed rice units; a gasifier demonstration in which puffed rice was made; and a question-and-answer session. As the demonstration was carried out in the cluster itself, the participants saw and appreciated the virtually smoke-free operation of the integrated gasifier-based puffed rice oven compared to the highly polluting traditional ovens. Inspired by the workshop, a puffed rice unit owner from Shimoga has shown interest in buying a gasifier-based oven.

### **Thailand princess leads NSTDA delegation to TERI**

As part of its ongoing efforts to promote regional cooperation in the fields of energy, environment, and sustainable development, TERI has been interacting for over a year with



Princess Maha Chakri Sirindhom of Thailand with NSTDA delegates at TERI, Gual Pahari

Thailand's NSTDA (National Science and Technology Development Agency). As an outcome of these interactions, a delegation of scientists and other experts from NSTDA, led by Princess Maha Chakri Sirindhorn of Thailand, visited TERI on 20 March 2008. The delegates were taken to TERI's facilities at Gual Pahari and shown various technologies developed by TERI, in particular, clean, energy-efficient technologies based on biomass gasification.

Enthused by the visit, the delegates expressed their keenness to explore closer cooperation with TERI. During the visit, an MoU was signed between TERI and the NSTDA. According to the MoU, TERI will demonstrate and promote biomass gasifier technology in Thailand, while the NSTDA will demonstrate and promote PVT (photovoltaic-thermal) technologies in India.

### **Workshops to facilitate planning for village energy security**

A robust VEP (village energy plan) is vital for the success and sustainability of any village energy project. As reported in *CoSMiLE Update*, September 2007 (Volume 2, Issue 3), the MNRE has identified TERI as the National Consultant, as well as one of the Regional Consultants, to help in implementing the pilot phase of the VESP (Village Energy Security Programme) projects in India under the World Bank project titled 'Biomass for sustainable development'.



The National Consultant team made field visits to the eastern, western, central, and southern regions and reviewed the existing VEPs. The reviews revealed inadequacies in the processes that were being followed up while preparing the VEPs.

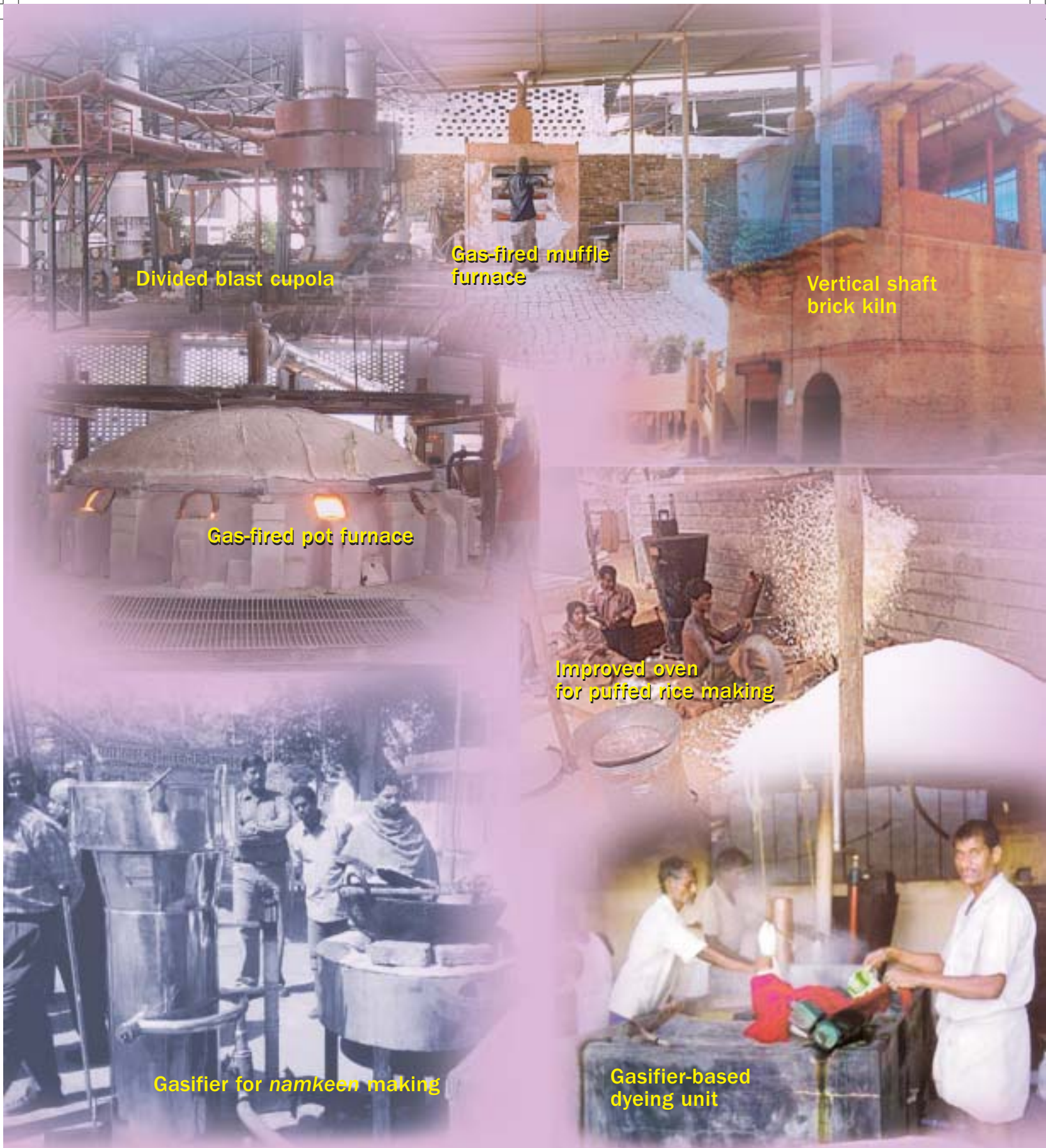
In order to strengthen the capacities of field teams, project implementing agencies, and state nodal agencies in evolving VEPs, regional consultants facilitated three training workshops—one each in the central, western, and eastern regions, as summarized below.

Teams from the World Bank and MNRE participated in these workshops and guided the trainees.

Region	Location	Date	Regional Consultant/ Partners
Central	Raipur	8 January	S R Corporate Consultants
West	Pune	15 January	READ Foundation
East	Guwahati	22 January	TERI/Ecosystems India/FOSET

### Events calendar

1. Workshop on 'Thematic Issues on Cluster Development'; New Delhi, 17 April 2008.  
This workshop will be organized jointly with MSME Foundation and will focus on energy issues in MSME clusters as well as issues related to cluster development and poverty reduction.
2. Release of book titled 'Towards cleaner technologies: a process story in the Firozabad glass industry cluster'. New Delhi, April 2008.  
This book is the third in a series of process documents on TERI-SDC interventions in the small and micro enterprises sector.
3. Commissioning of a 2-shaft VSBK (vertical shaft brick kiln) at Cuddalore, Tamil Nadu; April 2008.
4. Commissioning of a 24-inch DBC (divided blast cupola) at Kalsi Metal Works, Jalandhar, Punjab; April 2008.
5. Workshop to discuss the outcome of the study titled 'Situation analysis for SME sector across clusters in South and East India', Bangalore, May/June 2008.  
TERI undertook this study in association with AC Nielsen ORG-MARG Pvt Ltd as part of the recently launched BEE (Bureau of Energy Efficiency)—SME programme.
6. Workshop on 'Development of detailed VESP proposals and preparation of village energy plans'; New Delhi, 2 May 2008.
7. Workers' solidarity meet on NREGA at Rae Bareilly, 1 May 2008. About three hundred workers from six blocks are expected to participate along with brick firemen families.
8. Women leaders solidarity meet, Lalganj, May 2008. The meet will bring women leaders of firemen sangathan in touch with women leaders from other walks of life.
9. Awareness programmes on biomass devices, 21 May 2008, Belgaum, and 11 June 2008, Hubli.
10. Workshop on 'Energy conservation opportunities in the brick industry', 8 May 2008, Badaui, Uttar Pradesh.



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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