

SMALL AND MEDIUM ENTERPRISES: ENERGY EFFICIENCY KNOWLEDGE SHARING **SAMEEEKSHA** www.sameeksha.org **NEWSLETTER**

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VISION
SAMEEEKSHA envisages a robust and competitive SME sector built on strong foundations of knowledge and capabilities in the development, application, and promotion of energy-efficient and environment-friendly technologies.



A PLATFORM FOR PROMOTING ENERGY EFFICIENCY IN SMEs

IN THIS ISSUE...

This issue focuses on an innovative strategy to promote energy efficiency sustainably and on a wide scale across industrial clusters, through strengthening the technical capacities of shop floor level personnel in train-the-trainer (TOT) mode. The theme article describes such an initiative implemented by TERI in the Faridabad engineering cluster, with the support of Shakti Sustainable Energy Foundation (SSEF) and in close partnership with the local industry association, IamSMEofIndia. Faridabad is a large and industrially diverse cluster with over 12,000 industrial units. TERI first conducted baseline surveys on a number of industrial units. Besides helping to estimate the potential for energy savings in different process areas and identify possible energy conservation measures for each sub-sector, the surveys enabled TERI to interact with machinery operators, supervisors and other shop floor technicians and understand the important technological and process areas in which they needed strengthening of their knowledge and skills. Based on this 'needs analysis', TERI developed a training curriculum and training resources customized to meet the needs of the shop floor personnel and be easily comprehensible to them. Finally, TERI trained a select group of shop floor personnel on energy efficient technologies and practices in TOT mode. With this, a core group of 'animators' has been created among the shop floor technicians in the Faridabad cluster; a group empowered with some basic knowledge and expertise on energy efficiency and best operating practices (BOP), as well as the training abilities and resources to impart their knowledge and skills to other shop floor level technicians in the cluster.

The issue also features highlights of two events: the 14th SAMEEEKSHA Platform meeting held in Kolkata—the first such meeting to be organized at regional level—and an awareness workshop in Ankleshwar on disseminating Japanese low carbon technologies (LCTs) in India, organized under the Japan–India Technology Matchmaking Platform (JITMAP).

SAMEEEKSHA Secretariat



SKILLING SHOP FLOOR TECHNICIANS TO CATALYSE ENERGY EFFICIENCY IN FARIDABAD CLUSTER

Context

A major reason why MSMEs do not utilize energy efficiently is that their shop floor level personnel lack the awareness, knowledge and technical skills required to operate the plant equipment/machinery optimally, i.e., with minimum wastage of energy, materials and time. While the need for upgrading the skills of shop floor technicians is obvious in cases where new technologies are being introduced, experience shows that even the existing technologies can yield significant energy savings at relatively low cost, if the technical knowledge and capabilities of machine/equipment operators, supervisors and other shop floor personnel are upgraded through training on best operating practices (BOP). However, there are few, if any, programs focusing exclusively on the training of shop floor personnel in MSME clusters. Another challenge is to find ways by which the new/improved technical knowledge and skills on energy efficiency (EE) can be imparted to other MSMEs across and even beyond the cluster, without external support.

TERI, with the support of Shakti Sustainable Energy Foundation (SSEF), undertook an initiative to promote EE in the Faridabad engineering cluster through the training of select shop floor technicians on EE technologies and BOP in 'train-the-trainer' (TOT) mode. The aim was to create a core group of 'animators', who would themselves function as trainers to convey their knowledge and skills related to EE to other shop floor personnel in MSMEs across the cluster.

Faridabad is one of India's largest and fastest growing engineering clusters, with over 12,000 MSME units representing a wide range of energy intensive sub-sectors such as forging, foundry, die casting, metal fabrication, rubber and plastics, textiles and so on. TERI formulated and conducted its activities in the Faridabad cluster in close

partnership with the local industry association, IamSMEofIndia. This initiative was a component of the SSEF-supported project (see Box).

About the project

The project titled 'Advancing Energy Efficiency in the Micro, Small and Medium Enterprise (MSME) sector in India', supported by SSEF and implemented by TERI during 2017–18, had the following components:

- Preparing energy profiles of 10 MSME clusters
- Studying and assessing the training/skilling needs of shop floor technicians in the Faridabad MSME cluster

Assessing energy saving potential, gauging training needs

The first step was to conduct baseline studies on select MSMEs in the cluster—to understand the current technologies and operating practices; assess the potential for energy savings; identify possible energy conservation measures (ECMs); and get a better idea of the existing capabilities of shop floor personnel and the areas in which they required additional/improved knowledge and skills. IamSMEofIndia nominated 10 MSME units for the studies, representing six energy intensive sub-sectors (Table 1). TERI conducted the baseline surveys, prepared detailed survey reports and shared them with the respective units. Follow-ups visits were made to the individual units to encourage the entrepreneurs to adopt the identified ECMs. Typical ECMs included:

- Replacing existing furnaces with EE furnaces
- Thermal insulation improvement



- Use of blowers in place of compressed air
- Optimizing pressure setting in air compressors
- VFD application on motor drives
- Overhauling of DG set

Vitally, the surveys and follow-up visits provided an opportunity for the TERI team to interact and establish rapport with the plant-level personnel, understand their existing capabilities and perspectives, and pinpoint the important technological and process areas in which the shop floor technicians needed strengthening of their knowledge and skills. These included:

- New EE technologies like IE3 motors, IGBT furnaces and inverter air compressors
- BOP like furnace insulation, optimum pressure setting of air compressors, and instrumentation & control
- Analysis of electricity bills to optimize demand charges and power factor
- Preventive maintenance aspects such as cleaning of air filters, greasing and ventilation.

Table 1. MSMEs covered by baseline surveys

Sub-sector	No. of MSMEs
Die casting	2
Forging	2
Foundry	1
Metal fabrication	1
Rubber and plastics	2
Textiles	2
Total	10

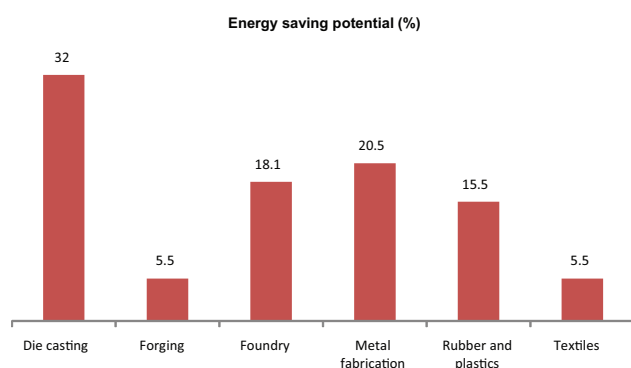
Training the trainers

Based on the insights gathered from the baseline surveys— which constituted a ‘needs analysis’ of the training requirements of the shop floor technicians— TERI developed a curriculum and training modules for its TOT program. This was a challenging task. TERI’s available training resources were designed



Baseline surveys





Energy saving potential identified for different sub-sectors

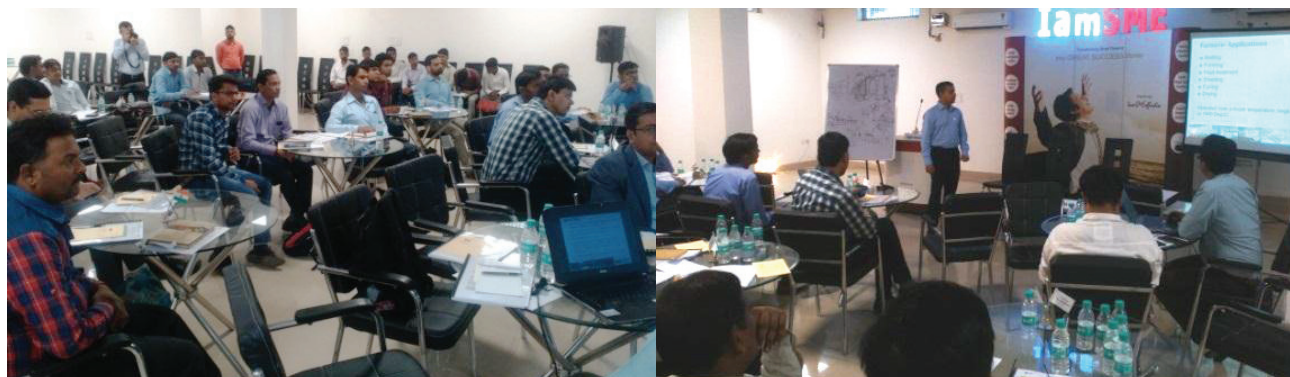
for middle/senior level industry personnel—who typically possess theoretical knowledge in science or engineering. In sharp contrast, the shop floor technicians had little or no theoretical knowledge of sciences or engineering disciplines. TERI therefore customized its existing training modules for the shop floor technicians, to make the content easy to understand yet comprehensive, with less emphasis on theory and much greater stress on practical/hands-on training and BOP.

Five broad topics were identified for the TOT program:

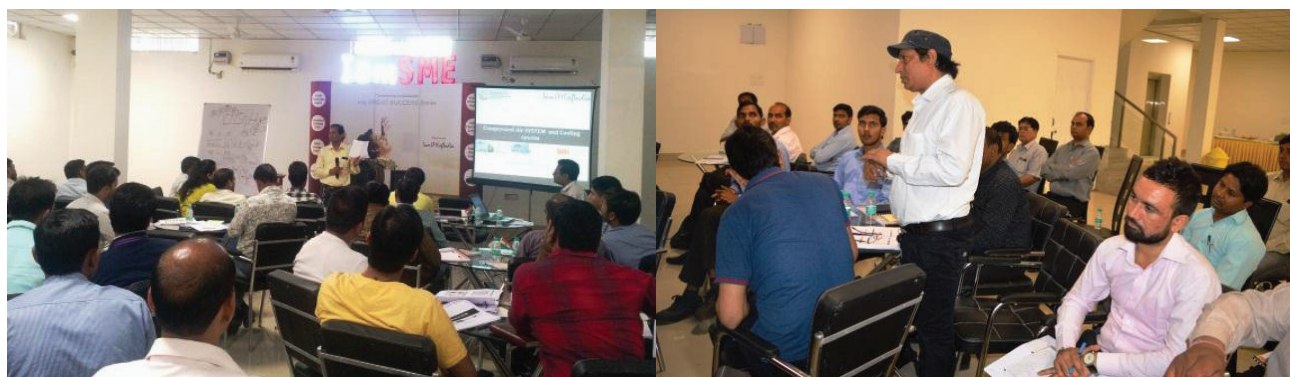
- Furnace systems
- Electrical systems
- Compressed air systems
- Cooling water systems
- Lighting systems

Detailed training modules were prepared for each of the five topics. Particular care was taken to keep the content simple and practical so as to match the needs and capacities of the trainees. The training modules were enriched with visual content such as photographs, diagrams, graphs, flow-sheets and tables for easy comprehension and enhanced retention by the participants. A number of case studies were included to highlight the benefits of EE technologies and practices, in terms of energy and monetary savings and the payback periods on investments in ECMs.

The TOT programs were carried out in two sessions at the office of IamSMEofIndia. The first session was held on 15th March 2018 for about 20 shop



1st TOT session



2nd TOT session



floor technicians selected by the association. In this session, the participants were provided with sound foundational knowledge on each of the five topics. The second session was held in 10th April 2018, and was attended by a total of 45 participants comprising the core group of 20 as well as others. During this session, a number of trainees were encouraged to practice and hone their own presentation/training skills using the training modules, with TERI providing technical backstopping support. This session helped in boosting the participants' confidence levels and enhancing their training skills.

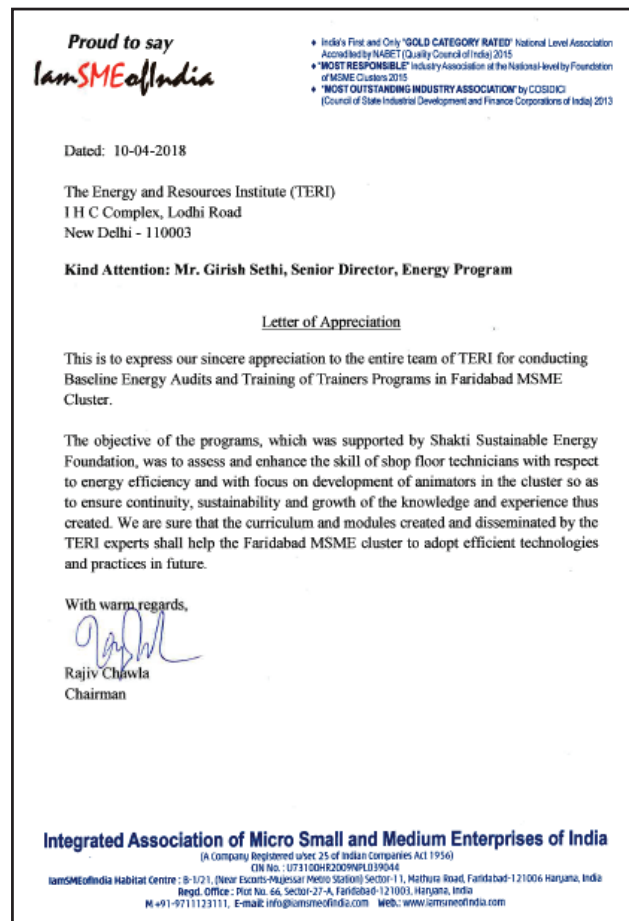
Taking stock

The project has created a core group of 'animators' among the shop floor technicians in the Faridabad cluster; a group whose members have each been empowered with some basic knowledge and expertise on EE technologies and practices, as well as the training skills and resources to impart their knowledge and skills to other shop floor level technicians in the cluster. The feedback from the participants suggests that the animators are proving effective as trainers. By way of example, TERI received the following feedback from an MSME entrepreneur who had sent a shop floor technician from his plant for the TOT program:

"We are a member of lamSMEofIndia and attended your valuable and informative workshop. Our shop-floor in-charge, Mr Satyender, is in constant touch with you and doing as directed by you. He might have shared some data/findings with you too. We are very much thankful for all your support extended."

Mr Rajesh Madaan
Edge Gro Industries, Tronica City

The project has clearly underlined the effectiveness of customizing training modules to match the needs and capacities of shop floor technicians, with less focus on theory and more on practical aspects, with stress on BOP. The training modules have contributed to strengthening the knowledge base of the cluster. There is good potential to replicate the shop floor level TOT model not only within the Faridabad cluster but also in other MSME clusters.



14th MEETING OF SAMEEEKSHA

The 14th Coordination Committee Meeting of SAMEEEKSHA was held in Kolkata on 23rd August 2018. The participants included representatives from BEE (Bureau of Energy Efficiency), MSME Development Institutes (MSME-DIs), Shakti Sustainable Energy Foundation (SSEF) and associations of various industry sub-sectors from the eastern region of the country. Welcoming the participants, Dr Ajay Mathur, Director General, TERI mentioned that SAMEEEKSHA is now being supported by SSEF after having been supported by Swiss Agency for Development and Cooperation (SDC) for many years. He noted that this was the first regional meeting of SAMEEEKSHA, and urged participants to share their views on the kinds of opportunities they perceive and the challenges that they face.

Mr Subhashish Dey, Program Manager (Energy Efficiency), SSEF informed the participants about the knowledge resources that have been hosted on the SAMEEEKSHA website, such as MSME Energy Map, data on energy use in 99 MSME clusters, etc. Mr Ajoy Bandopadhyaya, Director,

MSME-DI Kolkata, shared his first-hand experience of witnessing the growth of Gujarat ceramic ware industry as officer with the Glass and Ceramics division in MSME-DI. Mr Abhay Bakre, Director General, BEE, explained that the idea of organizing platform meetings at a regional level is to better enable the cluster-level stakeholders to participate and to contribute to the discussions for development of the MSME sector.

Presentations and discussions

Mr Sachin Kumar, Secretary, SAMEEEKSHA and Fellow, TERI, provided an update on the SAMEEEKSHA Platform and also shared the key outcomes of the National Summit on MSMEs (31 October–01 November 2017). Two technical sessions followed: the first session, on 'Scaling-up energy efficient technological solutions', was chaired by Dr Ajay Mathur, TERI; the second, on 'BEE and MoMSME initiatives in Eastern Region' was chaired by Mr Abhay Bakre, BEE. The following presentations were made to guide the subsequent roundtable discussions:



Snapshots of meeting

- Factors influencing uptake of energy efficiency in Indian MSMEs— Mr Tirtha Biswas, CEEW (Council on Energy, Environment and Water)
- Promoting EE technologies and best practices: TERI's intervention among the MSMEs in eastern region— Mr Prosanto Pal and Mr Pawan Kumar Tiwari, TERI
- Energy efficiency programs initiated by BEE for MSMEs—Mr Milind Deore, Director, Bureau of Energy Efficiency
- Initiatives undertaken by MSME-DI among MSMEs—Mr Monojit Guha, Deputy Director, MSME-DI Kolkata

The salient points from the presentations and discussions are summarized below.

- Mr Suvra Majumdar, Technical Expert, UNDP, pointed out the need for a deep dive intervention among cold storage units in Jharkhand, where about 35% of perishable food material gets lost in the absence of proper storage facilities.
- Dr SK Sahoo, Deputy Director, MSME-DI, Cuttack, emphasized the need for cluster-focused sensitization-cum-awareness programs on energy efficiency aspects. He also mentioned prominent MSME clusters in Odisha where EE interventions are needed, including rice mills (Baragarh and Baleshwar), plastics (Balasore), pharmaceutical, seafood, dry fish (Paradip), and flyash (Angul).
- Mr Anirbandip Dasgupta, Indian Refractory Manufacturers Association, underlined the need to help refractory units switch over from downdraft (DD) kilns to advanced firing technologies such as tunnel kiln, which would improve energy efficiency by about 30%. He also stressed the need to organize awareness programs for the SME units in the refractory sector.
- Mr Harish Patel, Secretary, North Orissa Chamber of Commerce and Industries (NOCCI), suggested simplification of procedural requirements to undertake energy audits under government-funded schemes.
- Mr Ashok Tiwari, President, West Bengal Brick Field Owners Association, stressed that policies related to brick industry must be formulated in consultation with the brick industry association, and suggested that specific programs be organized for brick field owners to fully understand their concerns.
- Mr Shubhashis Dey, Program Manager (Energy Efficiency), SSEF, provided an outline of 'ROSHANEE' (Roadmap of Sustainable and Holistic Approach to National Energy Efficiency)—an initiative by BEE to revise the National Mission for Enhanced Energy Efficiency.



AWARENESS WORKSHOP: DISSEMINATION OF JAPANESE LOW CARBON TECHNOLOGIES IN INDIA

- The Institute for Global Environmental Strategies (IGES), Japan, and TERI organized an awareness workshop on disseminating Japanese low carbon technologies (LCTs) in India on 30th August 2018 in Ankleshwar, as part of the activities under the Japan–India Technology Matchmaking Platform (JITMAP) supported by IGES–TERI (for more information, see www.jitmap.org). The workshop was co-organized with Ankleshwar Industries Association (AIA), Dahej Industries Association (DIA), Gujarat Energy Development Agency (GEDA) and Gujarat Industrial and Technical Consultancy Organisation Limited (GITCO). The event drew over 100 participants, primarily from the local industries. They were provided an overview of the JITMAP initiative and encouraged to identify the LCTs that were needed in the Ankleshwar cluster in general, and at their own factories in particular, to explore matching their LCT needs with the appropriate Japanese LCT suppliers.
- The workshop provided an opportunity to present two Japanese LCTs that could find wide

applications in industries across Ankleshwar: (1) energy efficient (EE) transmission belts from Bando Chemicals India Pvt Ltd; and (2) EE air compressors from Kobelco Compressors India Pvt Ltd. Interestingly, feedback from the participants revealed that over 90% of them had not known about these LCTs before the workshop—evidencing the event’s effectiveness in creating awareness and opening up mutually beneficial business matching opportunities for the Japanese LCT suppliers and Indian end-users. At the end of the workshop, a number of participants requested the representatives of Bando Chemicals and Kobelco Compressors to visit their industrial units and study the feasibility of installing the LCTs. It is pertinent to mention that the awareness workshop was held back-to-back with a series of feasibility studies conducted for Bando Chemicals’ belt technologies at pharmaceutical, glass, chemicals and chlor-alkali industries in Ankleshwar, and for Kobelco’s air compressors at a textile factory in Daman.



Site visit to explore feasibility of installing LCTs



Workshop in session

SAMEEEKSHA is a collaborative platform aimed at pooling the knowledge and synergizing the efforts of various organizations and institutions—Indian and international, public and private—that are working towards the common goal of facilitating the development of the Small and Medium Enterprise (SME) sector in India, through the promotion and adoption of clean, energy-efficient technologies and practices.

SAMEEEKSHA provides a unique forum where industry may interface with funding agencies, research and development (R&D) institutions, technology development specialists, government bodies, training institutes, and academia to facilitate this process.

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