SAMEEEKSHA
SMALL AND MEDIUM ENTERPRISES: ENERGY EFFICIENCY KNOWLEDGE SHARING

Promoting Energy Efficiency in SMEs
SAMEEEKSHA

16th Meeting

14 September 2019

The Energy and Resources Institute (TERI)
New Delhi

SAMEEEKSHA

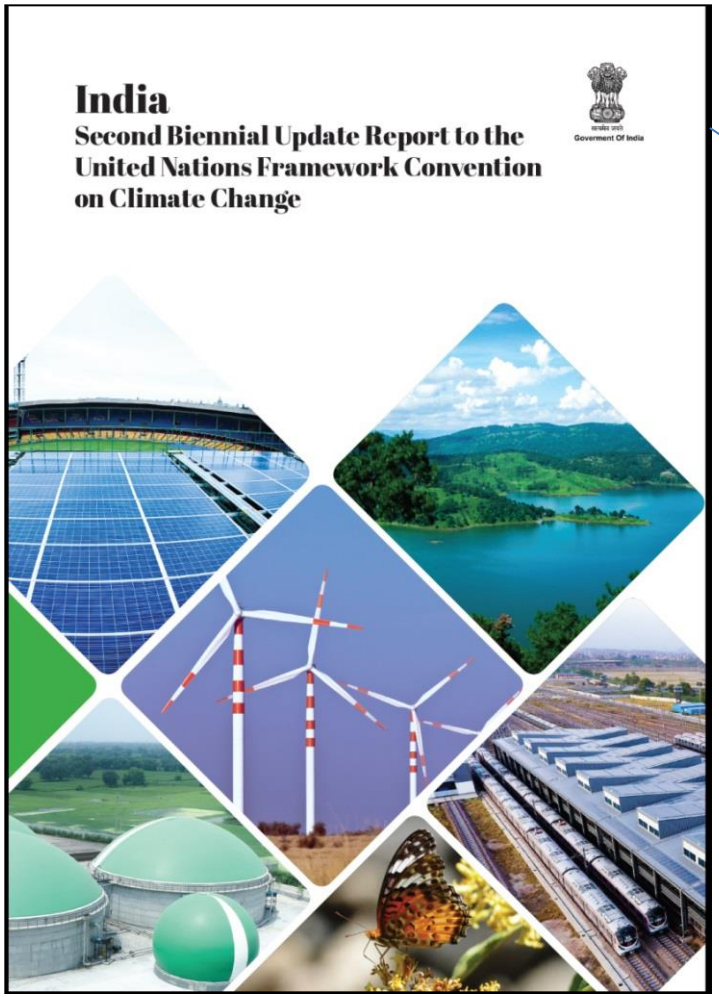
Small and Medium Enterprises: Energy Efficiency Knowledge Sharing

- Platform for pooling the knowledge and experiences of various organizations that are engaged with the Indian SME sector.
- Enables like-minded organizations to coordinate and increase the impact of their activities in different areas in the SME sector.

SAMEEEKSHA

- Provides a forum where representatives of small-scale industry interact with policy-makers, funding and development agencies, R&D institutions, academia, and others, in order to:
  - Highlight the needs of sector/cluster in regard to improving energy efficiency, reducing fuel costs, exploring alternate energy sources, and so on.
  - Point to possible options for exploring, developing, and introducing energy-efficient technologies and practices in the concerned industrial sector/cluster.
  - http://sameeeksha.org/

SAMEEEKSHA included in India Second Biennial Update Report



reduction in the time taken for processing and granting approvals based on scientific and technical inputs. In this context, the Government of India launched *'PARIVESH'* (Pro Active and Responsive facilitation by Interactive and Virtuous Environmental Singlewindow Hub), a Single-Window Integrated Environmental Management System for expeditious and transparent clearances in environment, forest, wildlife and coastal regulatory zone. The Ministry is using EIA to promote climate-friendly sustainable infrastructure development. One such example is related to the building and construction sector. Under the EIA process, the Ministry gives higher priority for environmental clearance to construction projects which have obtained green building rating by integrating a high-level of environmental norms into their building plans.

6.4.2 *SAMEEEKSHA*

Sameeeksha is a e-platform providing comprehensive information as well as an opportunity to the representatives of Micro, Small & Medium Enterprises (MSME) sector for an interface with policymakers, funding and development agencies, R&D institutions and academia to promote energy efficiency and best operating practices in the sector. This platform is supported by the Ministry of MSME, Bureau of Energy Efficiency, Swiss Agency for Development and Cooperation and Shakti Sustainable Energy Foundation. The secretariat of *Sameeeksha* is housed at The Energy Resource Institute (TERI). A MSME Energy Map has been developed, which is a dynamic tool that provides insights into energy-intensive MSME clusters across the country, on which detailed energy-related information and data is available. So far, the *Sameeeksha* database accounts for about 27.3 Mtoe of energy consumption in 109 MSME clusters across the country (*sameeeksha.org*, 2018).

6.4.3 Super-efficient Equipment and Appliance Deployment (SEAD)

India is a member country of the Super-efficient Equipment and Appliance Deployment (SEAD) initiative, which is a voluntary collaboration among governments working to promote the manufacture, purchase, and use of energy-efficient appliances, lighting, and equipment worldwide. SEAD is an initiative under the Clean Energy Ministerial (CEM). The SEAD Initiative works with manufacturers, purchasers, purchase influencers, and policymakers to award feature-rich, energy-efficient products that provide top-quality services while reducing energy costs (CEM, 2016).

6.4.4 *PAHAL* – Mass Collaboration for Clean Cooking Fuel

The Ministry of Petroleum and Natural Gas (MoPNG), Government of India, launched a modified Direct Benefit Transfer of LPG (DBTL) scheme *'Pahal (Pratyaksh Hanstantrit Labh)'* in 54 districts on 15th November 2014, which was extended to the entire country on 1st January 2015.

Figure 6.13: *PAHAL* acknowledged by Guinness Book of World Records (2015)

Liquefied Petroleum Gas (LPG) is used in most urban and rural households and is subsidized. To reduce subsidies, a programme was launched to encourage well-to-do households to voluntarily give up their LPG subsidy so that it could be targeted to the poor who generally use fuelwood, cow dung, crop residue and coal as cooking fuel. Data from the MoPNG indicates that as of January 2018, more than 0.57 million households had voluntarily surrendered their LPG subsidy. The availability of subsidy encourages people to move away from fuelwood, cow dung and crop residue to LPG.

LPG consumers who join the *PAHAL* scheme will get LPG cylinders at market price and receive LPG subsidy (as per their entitlement) directly into their bank accounts.

In 2015, *PAHAL* was acknowledged by the Guinness Book of World Records for being the largest cash transfer programme, with 125.7 million households receiving cash transfer as of 30th June 2015 (PIB, 2015) (Figure 6.13).

As on 1st March 2018, around 198.8 million LPG consumers have joined the scheme and an amount of ₹6,80,203.5 million has been transferred to the bank accounts of LPG consumers since the inception of the scheme (PIB, 2018). Direct transfer modality under the scheme has ensured substantive savings on supply of LPG consumers to the households by replacing inactive accounts.

An update from SAMEEEKSHA Secretariat: (Feb 2019 – Aug 2019)

15th Meeting - Regional meeting at Coimbatore (August 2018)

Presentations

- SAMEEEKSHA Platform: an update—Mr Sachin Kumar, Secretary, SAMEEEKSHA

Technical Session

- BEE's initiative in MSME sector - Mr. Milind Deore, BEE
- UNIDO's intervention in Southern region, Mr. Suresh Kennith, UNIDO
- TERI's intervention among the MSMEs in Southern region— Mr Prosanto Pal, TERI

SAMEEEKSHA Newsletter


SMALL AND MEDIUM ENTERPRISES: ENERGY EFFICIENCY KNOWLEDGE SHARING

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SAMEEEKSHA

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NEWSLETTER

Inside...

- Skilling shop floor technicians to catalyse energy efficiency in Faridabad cluster
- 14th meeting of SAMEEEKSHA

Promoting Energy Efficiency in SMEs

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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.

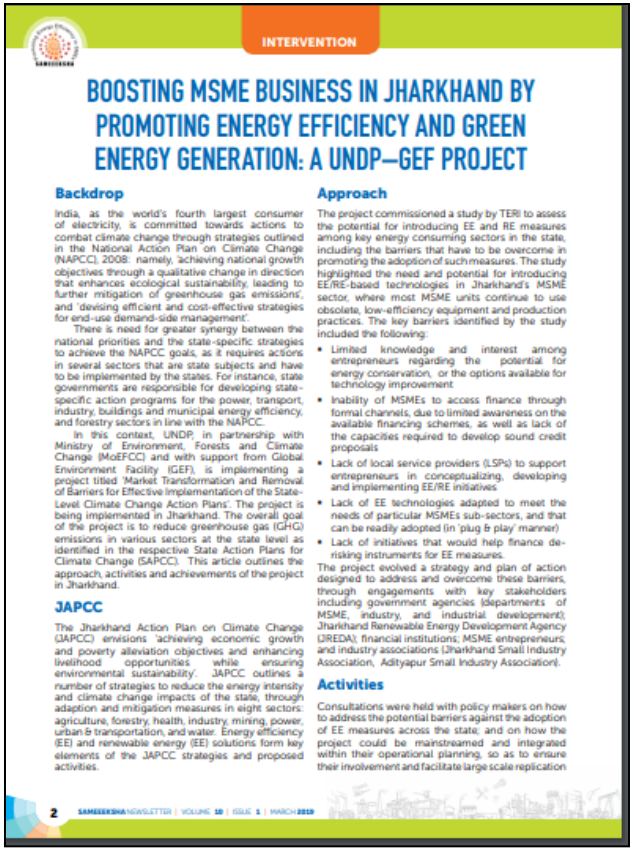
A PLATFORM FOR PROMOTING ENERGY EFFICIENCY IN SMEs

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


INTERVENTION

BOOSTING MSME BUSINESS IN JHARKHAND BY PROMOTING ENERGY EFFICIENCY AND GREEN ENERGY GENERATION: A UNDP–GEF PROJECT

Backdrop

India, as the world's fourth largest consumer of electricity, is committed towards actions to combat climate change through strategies outlined in the National Action Plan on Climate Change (NAPCC), 2008: namely, 'achieving national growth objectives through a qualitative change in direction that enhances ecological sustainability, leading to further mitigation of greenhouse gas emissions', and 'devising efficient and cost-effective strategies for end-use demand-side management'.

There is need for greater synergy between the national priorities and the state-specific strategies to achieve the NAPCC goals, as it requires actions in several sectors that are state subjects and have to be implemented by the states. For instance, state governments are responsible for developing state-specific action programs for the power, transport, industry, buildings and municipal energy efficiency, and forestry sectors in line with the NAPCC.

In this context, UNDP, in partnership with Ministry of Environment, Forests and Climate Change (MoEFCC) and with support from Global Environment Facility (GEF), is implementing a project titled 'Market Transformation and Removal of Barriers for Effective Implementation of the State-Level Climate Change Action Plans'. The project is being implemented in Jharkhand. The overall goal of the project is to reduce greenhouse gas (GHG) emissions in various sectors at the state level as identified in the respective State Action Plans for Climate Change (SAPCC). This article outlines the approach, activities and achievements of the project in Jharkhand.

JAPCC

The Jharkhand Action Plan on Climate Change (JAPCC) envisions 'achieving economic growth and poverty alleviation objectives and enhancing livelihood opportunities while ensuring environmental sustainability'. JAPCC outlines a number of strategies to reduce the energy intensity and climate change impacts of the state, through adaption and mitigation measures in eight sectors: agriculture, forestry, health, industry, mining, power, urban & transportation, and water. Energy efficiency (EE) and renewable energy (RE) solutions form key elements of the JAPCC strategies and proposed activities.

Approach

The project commissioned a study by TERI to assess the potential for introducing EE and RE measures among key energy consuming sectors in the state, including the barriers that have to be overcome in promoting the adoption of such measures. The study highlighted the need and potential for introducing EE/RE-based technologies in Jharkhand's MSME sector, where most MSME units continue to use obsolete, low-efficient and energy-inefficient equipment and production practices. The key barriers identified by the study included the following:

- Limited knowledge and interest among entrepreneurs regarding the potential for energy conservation, or the options available for technology improvement
- Inability of MSMEs to access finance through formal channels, due to limited awareness on the available financing schemes, as well as lack of the capacities required to develop sound credit proposals
- Lack of local service providers (LSPs) to support entrepreneurs in conceptualizing, developing and implementing EE/RE initiatives
- Lack of EE technologies adapted to meet the needs of particular MSMEs sub-sectors, and that can be readily adopted (in 'plug & play' manner)
- Lack of initiatives that would help finance de-risking instruments for EE measures.

The project evolved a strategy and plan of action designed to address and overcome these barriers, through engagements with key stakeholders including government agencies (departments of MSME, industry, and industrial development); Jharkhand Renewable Energy Development Agency (JREDA); financial institutions; MSME entrepreneurs; and industry associations (Jharkhand Small Industry Association, Adityapur Small Industry Association).

Activities

Consultations were held with policy makers on how to address the potential barriers against the adoption of EE measures across the state; and on how the project could be mainstreamed and integrated within their operational planning, so as to ensure their involvement and facilitate large scale replication

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Mar' 19 Issue

- Focus on UNDP-GEF-MoEFCC project 'Market Transformation and Removal of Barriers for Effective Implementation of the State-Level Climate Change Action Plans in the state of Jharkhand

SMALL AND MEDIUM ENTERPRISES: ENERGY EFFICIENCY KNOWLEDGE SHARING VOLUME 9 | ISSUE 4 | DECEMBER 2018

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NEWSLETTER

Inside...

- Promoting energy efficiency and renewable energy in selected MSME clusters: a GEF–UNIDO–BEE project
- Clean, energy efficient technologies introduced in Thangadh ceramic cluster

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IN THIS ISSUE...

This issue has, as its focus, the GEF-funded national project being executed by UNIDO in collaboration with BEE titled 'Promoting energy efficiency and renewable energy in selected micro, small and medium enterprises (MSME) clusters in India'. The aim of the project is to develop and promote energy efficient technologies (EETs) and to enhance the use of renewable energy technologies (RETs) in process applications in energy intensive MSME clusters representing five industrial sub-sectors: brass, ceramics, dairy, foundry, and hand tools. Thereby, the project improves the productivity and competitiveness of units; reduces CO_2 emissions and improves the local environment; and lays the foundations for introduction and scaling up of EETs and RETs in other MSME clusters. At present, the project is being executed in 12 MSME clusters across India.

The first article outlines the project strategy, activities and outcomes. The activities follow a holistic, iterative path in which the key elements include: energy audits and technology identification; capacity building and implementation assistance; training of vendors and technology demonstrations; documentation, dissemination and follow-up; and demand aggregation, price reduction and large-scale deployment of the improved technologies. In each cluster, experienced and dedicated 'Cluster Leaders' have been identified and provided with responsibility for implementation of project activities in consultation with the local industry association, consultants, and project team. Also, the project has established 'Energy Management Cells' (EMCs) within the respective industry associations in order to strengthen the ability of the cluster-level MSME owners/operators to undertake energy audits and identify energy saving measures on their own. The second article presents a few case studies on implementation of EETs/RETs from the Thangadh ceramic cluster, one of the clusters covered by the project, to showcase the benefits being brought about in terms of increased energy efficiency, improved productivity, and reductions in carbon emissions.

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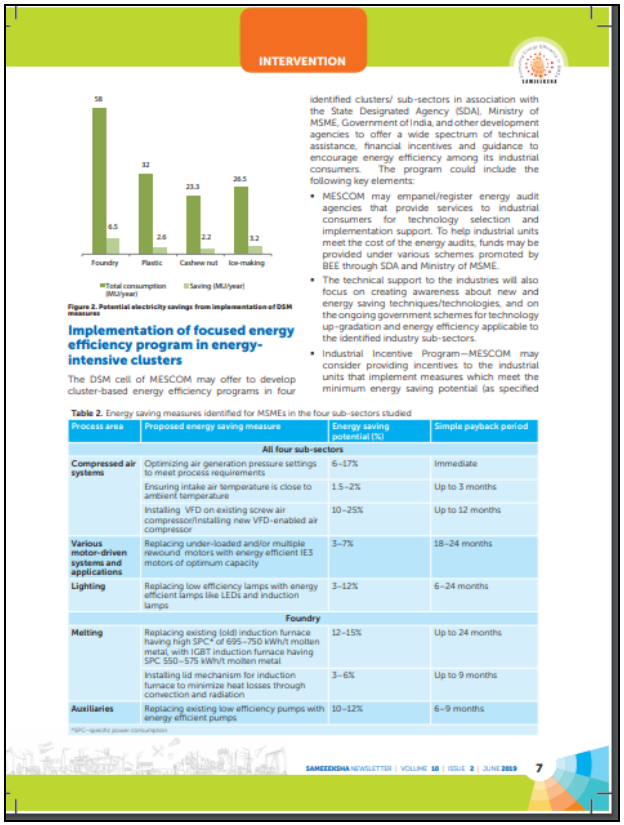

INTERVENTION

Figure 2. Potential electricity savings from implementation of DSM measures

Implementation of focused energy efficiency program in energy-intensive clusters

The DSM cell of MESCOM may offer to develop cluster-based energy efficiency programs in four identified clusters/ sub-sectors in association with the State Designated Agency (SDA), Ministry of MSME, Government of India, and other development agencies to offer a wide spectrum of technical assistance, financial incentives and guidance to encourage energy efficiency among its industrial consumers. The program could include the following key elements:

- MESCOM may empanel/register energy audit agencies that provide services to industrial consumers for technology selection and implementation support. To help industrial units meet the cost of the energy audits, funds may be provided under various schemes promoted by BEE through SDA and Ministry of MSME.
- The technical support to the industries will also focus on creating awareness about new and energy saving techniques/technologies, and on the ongoing government schemes for technology up-gradation and energy efficiency applicable to the identified industry sub-sectors.
- Industrial Incentive Program—MESCOM may consider providing incentives to the industrial units that implement measures which meet the minimum energy saving potential (as specified

Table 2. Energy saving measures identified for MSMEs in the four sub-sectors studied

Process area	Proposed energy saving measure	Energy saving potential (%)	Simple payback period
All four sub-sectors			
Compressed air systems	Optimizing air generation pressure settings to meet process requirements	6–17%	Immediate
	Ensuring intake air temperature is close to ambient temperature	1.5–2%	Up to 3 months
	Installing VFD on existing screw air compressor/Installing new VFD-enabled air compressor	10–25%	Up to 12 months
Various motor-driven systems and applications	Replacing under-loaded and/or multiple rewound motors with energy efficient IE3 motors of optimum capacity	3–7%	18–24 months
Lighting	Replacing low efficiency lamps with energy efficient lamps like LEDs and induction lamps	3–12%	6–24 months
Foundry			
Melting	Replacing existing (old) induction furnace having high SPC* of 695–750 kWh/t molten metal, with IGBT induction furnace having SPC 550–575 kWh/t molten metal	12–15%	Up to 24 months
	Installing lid mechanism for induction furnace to minimize heat losses through convection and radiation	3–6%	Up to 9 months
Auxiliaries	Replacing existing low efficiency pumps with energy efficient pumps	10–12%	6–9 months

*SPC–specific power consumption

Jun' 19 Issue

Focused on Demand Side Management (DSM), a strategy that is being explored by a large number of DISCOMs with the aim of reducing the energy demand and energy bills of consumers and simultaneously improve their operational efficiency and profitability

Major points Discussed during the last meeting

- Need to incentivize manufacturing of EE pumps / support for development of IE3 and IE4 motors / upgrade the design of existing pumps / development of standards for solar pumping system
- Need to increase awareness on star labeling
- Need for testing facilities

Energy intensive MSME clusters in Western region

Energy consumption and saving potential in MSMEs

S No	Sector	State	Clusters	Energy (toe)
1	Foundry & forging	Gujarat	4	196434
2	Light engineering	Gujarat	5	17647
3	Mixed industries	Gujarat	1	3400
4	Food Processing	Gujarat	3	17725
5	Chemicals	Gujarat	3	778670
6	Brick	Gujarat	1	2780000
7	Glass and Ceramic	Gujarat	3	1131630
8	Textiles	Gujarat	2	1693953
9	Others	Gujarat	3	88301
10	Textiles	Maharashtra	2	418887
11	Chemicals	Maharashtra	1	20501
12	Foundry & forging	Maharashtra	3	322176
13	Brick	Maharashtra	1	2100000
14	Others	Maharashtra	1	4217
	Total		**33**	**9573541**

- **Estimated energy saving potential: 950 – 11400 kilo toe considering a potential of 10-15%**

Way forward

- A number of energy intensive MSME clusters exist in Western India accounting for significant energy consumption and GHG emissions
- Cluster and unit level analysis indicate significant energy saving potential through:
  - Best operating practices
  - Equipment retrofits, and
  - Technology modernisation or upgradation
- Need for more in-depth studies in select clusters and initiate ‘cluster energy performance enhancement programs’

Thank You

SAMEEEKSHA Secretariat

S. No	Title	Sector	Location	Savings
1	Replacement of existing kiln car with low thermal mass kiln car with silicon carbide furniture in a ceramic unit	Ceramic	Khurja	#Overall energy saving of 33% (58,100 Sm^3 per tonne CO_2 per year) #Monetary saving- 25 lakh rupees.
2	Replacing traditionally designed reheating furnace with EE furnace system in glass bangle industry	Glass	Firozabad	#Efficiency of furnace improved by 8% #Average gas consumption reduced by 265 Sm^3/day #14 lakh annually #GHG reduction of 162 tonne CO_2 per year
3	Replacing downdraft kiln with chamber kiln in a refractory industry	Refractory	Burnpur	#The SEC of refractory production of the unit was reduced by 4.1 GJ/tonne of product #Energy saving of about 42% #equivalent to 265 tonne of coal per year against 1800 tonne of refractory production(172 toe per year) #GHG reduction of 695 tonne CO_2 per year
4	Replacement of manual jigger with double roller head automatic jigger in a ceramic unit	Ceramic	Khurja	#The SEC of ceramic product has been reduced by 0.7 kWh per thousand pieces with an estimated energy saving of about 38% # 19 lakh per year #3600 kWh annual energy saving #GHG reduction of 3 tonne CO_2 per year
5	Replacing furnace oil fired forging furnace with induction billet heater in a forging industry	Forging	Pune	#138 kL Of FO #42.1 Lakhs annually

S. No	Title	Sector	Location	Savings
6	Fuel switch from furnace oil to natural gas in forging furnaces	Forging	Pune	#89630 Litre of FO #13.3 Lakh annually #GHG reduction of 113 tonne CO_2 per year
7	Relining of forging furnace to reduce surface heat losses	Forging	Pune	#5600 SCM of NG annually #2.2 Lakh #GHG reduction of 4.8 tonne CO_2 per year
8	Application of veneering module in normalizing furnace	Forging	Pune	#15.9 toe/year #10.6 lakh #10.6 lakh #GHG reduction of 39 tonne CO_2 per year
9	Optimizing compressed air generation pressure in a forging unit	Forging	Pune	#718 kWh of electricity annually # 5000 rupees #GHG reduction of 0.6 tonne of CO_2 per year
10	Replacing NG fired forging furnace with induction billet heater in a forging unit	Forging	Pune	#106623 SCM of NG #26 lakh annually #GHG reduction of 33 tonne CO_2 per year

11	Optimising combustion air supply in an NG fired forging furnace	Forging	Pune	#11668 SCM NG annually #4.90 lakhs #GHG reduction of 20.4 tonne of CO_2 per year
12	Replacing standard motor with eergy efficiency motor in hammer in energy forging unit	Forging	Pune	#5848 kWh of electricity annually # 0.5 lakh annually #GHG reduction of 5.2 tonne CO_2 per year
13	Fuel switch for HSD to natural gas for painting oven, water heater and pre treatment tank	Forging	Pune	# 59038 Litre of HSD #10.2 lakh annually #GHG reduction of about 55 tonne CO_2 per year.
14	Replacement of inefficient FO fired furnace with energy efficient FO fired furnace with auto control system	Forging	Pune	#21259 litre of FO # 11 lakh per year #GHG reduction of 61.3 tonne CO_2 per year
15	Replacing inefficient induction furnace by energy efficient induction furnace: iron foundry unit	Foundry	Kolhapur	#Reducing the energy consumption for melting by about 23% #86400 kWh of electricity # 6.1 lakh #GHG reduction of 77 tonne CO_2 per year

16	Switchover from furnace oil fired furnace to electrical conduction furnace in aluminium melting	Foundry	Kolhapur	#annual energy consumption by 20.2 toe # 8.4 lakh annually #GHG reduction of 43 tonne CO_2 per year
17	Down- sizing of induction furnace for process optimization	Foundry	Kolhapur	# 15% reduction in the energy consumption of melting #169039 kWh of energy saving annually #13.9 lakh
18	Installing energy efficient electrical resistance furnace of suitable capacity for melting aluminium	Foundry	Kolhapur	# 238360 kWh of energy consumption annually # 19.2 lakh
19	Replacement of inefficient coke fired cupola by energy efficient induction furnace in cast iron castings production	Foundry	Kolhapur	# 515 tonne of coke # 47.2 lakh annually #GHG reduction of 265 tonne CO_2 per year
20	Replacing inefficient rewound motor with energy efficient motor in soft water pump in a cast iron foundry unit	Foundry	Kolhapur	# 26000 kWh of energy consumption annually #1.9 lakh annually # GHG reduction of 23 tonne CO_2 per year

21	Replacing inefficient transformer with energy efficient transformer in a cast iron foundry unit	Foundry	Kolhapur	# 38515 kWh of electricity consumption annually # 3.1 lakh # GHG reduction of 34 tonne CO_2 per year
22	Downsizing screw air compressor in a cast iron foundry unit	Foundry	Kolhapur	# 37110 kWh of electricity consumption annually #2.6 lakh annually #GHG reduction of 33 tonne CO_2 per year
23	Use of VFD based air compressor to meet variable load condition in a foundry unit	Foundry	Kolhapur	# 108930 kWh of electricity consumption annually #8.9 lakh #GHG reduction of 97 tonne CO_2 per year
24	Installation of shot blast machine in cupola based foundry unit	Foundry	Kolhapur	# 1.6 lakh annually #GHG reduction of 18 tonne CO_2 per year