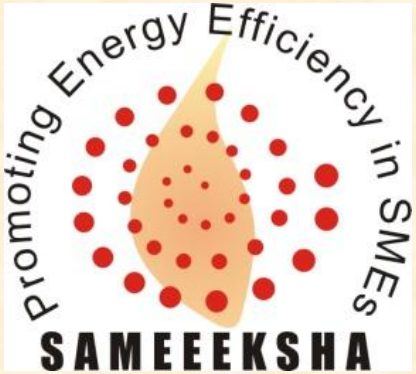
SAMEEEKSHA Knowledge Sharing Platform



11th Meeting, 28 July 2016

The Energy and Resources Institute (TERI)
New Delhi

teri

ENERGY IS LIFE
BEE
CONSERVE IT

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Swiss Agency for Development and Cooperation SDC

Government of India

‘SAMEEEKSHA’

SMALL AND MEDIUM ENTERPRISES: ENERGY EFFICIENCY KNOWLEDGE SHARING

A platform for promoting energy efficiency in MSMEs

Assists in disseminating knowledge on new projects, technologies and operating practices

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SAMEEEKSHA Secretariat: An update

(Dec'15 – June'16)

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10th Meeting (Dec, 2015)

Presentations

- Activities under the BEE-SME Program- BEE
- SIDBIs ongoing programs on promoting EE in MSMEs
- Update on TERI-SDC EESE project

Discussions

- Launching and popularizing the 'MSME energy map of India'
- Improving effectiveness and information base of the SAMEEEKSHA

SAMEEEKSHA Newsletter

SMALL AND MEDIUM ENTERPRISES: ENERGY EFFICIENCY KNOWLEDGE SHARING

VOLUME 4 | ISSUE 2 | JUNE 2015

SAMEEEKSHA NEWSLETTER

www.sameeeksha.org

Inside...

- **Case Study**— Study to promote energy efficient pumps in india
- **Cluster Profile**— Rajkot pump cluster
- **Events**— Fresh impetus to improving energy efficiency in Rajkot cluster — 9th Coordination Committee Meeting of SAMEEEKSHA

SAMEEEKSHA

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 pump sets, which are widely used in the agricultural, industrial, commercial, municipal and domestic sectors. Pump sets together consume almost a fifth of India's total electricity production, and account for a major portion of energy consumed in the agriculture sector.

TERI with the support of Shakti Sustainable Energy Foundation undertook a study in 2011–12 on 'Promoting energy efficient pumps in industry in India: addressing the energy and climate change problem', in order to understand the issues and challenges that have to be addressed in promoting energy efficient pump sets. The salient points of the study are carried in this issue.

In order to obtain the perspective of pump set manufacturers, TERI has engaged in extensive interactions with pump set units and other cluster-level stakeholders in Rajkot, one of the largest pump set manufacturing clusters in India. The gist of these interactions is presented in this issue in the form a cluster profile.

This issue also carries a report on the inception workshop held in Rajkot to mark the launch of fresh activities in this cluster under the current TERI–SDC partnership, and summaries of capacity-building workshops conducted by TERI in Rajkot under an ongoing SIDBI-supported Cluster Level Intervention Program (CLIP).

SAMEEEKSHA Secretariat

NEW AVENUES

EXTRUSIONS: AN EMERGING SUB-SECTOR OF THE SECONDARY ALUMINIUM INDUSTRY

Aluminium extrusion is picking up at a rapid pace in India, thanks to the burgeoning building, construction and consumer durables industries that are emerging as its major consumers. The annual production of the aluminium extrusions industry, comprising about 100 units is over 400,000 tonnes. However, the industry is highly fragmented with 70% of the units in small scale. Most of the units are concentrated in states like Gujarat, Delhi NCR, Telangana, Tamil Nadu and West Bengal. Since aluminium offers excellent mechanical properties, durability, corrosion and weather resistance, and undeniable aesthetic appeal, it is being widely used in the construction industry for a variety of applications. It helps in meeting aesthetic requirements and technical challenges for applications such as facades and interiors, roof construction, cladding, doors and windows, ceiling systems, high-quality light fittings and so on. The major products for the construction/building/consumer durables industry include door/window panes, bars, sheets, tubes, fencings, shutters, flooring steps/planks, AC grills, etc. Other applications where aluminium extrusions are being widely used include automotive components, solar panel frames & supports, bus bars and so on. Automotive sector has huge potential for extrusion products. As opposed to the average aluminium extrusions usage of 11.5 kg in Europe in passenger cars, the usage in India is as low as 2–3 kg per car.

In extrusion, the material is shaped by forcing it to flow through a shaped opening in a die. The extrusion process uses cast cylindrical billets as its raw material. The billets are sawn to typical lengths of 50–80 cm and heated to about 450°C. A hydraulic ram then forces the hot aluminium to flow through the die. Finally the extrusions are cut to length before being annealed. Temperature maintenance is most critical in the production process so as to achieve the essential characteristics of aluminium such as hardness and finish. The product is then heat treated and anodized as per requirement. At times, the ingots are preheated to 500°C to improve their metallurgical properties. Oil, gas or electricity are the major fuels used for heating of billets. The major energy consumption in an extrusion plant is electricity, which is used in heating, cutting, treatment and pulling. There appears to be a good potential to enhance the energy performance of the extrusion units by improvements in the melting process. TERI plans to include extrusion units as a key sub-sector in the proposed program for the secondary aluminium sector.

Extruded products

ABOUT SAMEEEKSHA

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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SAMEEEKSHA Newsletters

- Published two issues (December'15 and March'16)

Carrying:

- Dec' 15 Issue (**Focus theme-foundries**)
  - Profile on Coimbatore foundry cluster
  - Cluster News – EE initiatives in Rajkot foundry cluster
  - Project update – Profiling of energy intensive MSME clusters
  - Summary of 10th Meeting of SAMEEEKSHA

- March'16 Issue (**Focus theme- Secondary aluminium industry**)
  - Profile on Pune aluminium casting cluster
  - Cluster News— Identifying energy conservation opportunities in the Chennai aluminium casting cluster
  - Event update - Regional consultation on EE improvements in secondary aluminium sector
  - Note on Extrusions: An emerging sub-sector of the secondary aluminium industry

Gathering cluster level energy data

- Gathered data for new clusters and developed cluster profiles:
  - 33 cluster profiles (SDC)
  - 10 cluster profiles (Shakti)

- Total energy consumption in 43 clusters: **1.7 million tonnes of oil equivalent (mtoe)**

- SAMEEEKSHA now has details of cumulative total energy consumption of nearly 83 clusters (~ **10 mtoe)**
- Types of new clusters covered….

Gathering cluster energy data: 43 new clusters

Sub-sector	Clusters
Foundry	Belgaum, Shimoga, Coimbatore, Ahmedabad, Rajkot, Howrah, Samalkha, Saharanpur
Aluminium casting	Chennai, Pune
Forging	Chennai, Rajkot
Steel rerolling	Mandi gobindgarh, Bhavnagar
Engineering	Chandigarh, Mohali, Panchkula, Rajkot
Pumpset	Coimbatore, Rajkot
Rice mills	Bargarh, Berahampur, Redhills, Villupuram, Balasore
Plastics	Balasore, Ramnagar, Rajkot, Agra (footware)
Textiles	Jetpur, Panipat
Pharma	Dehradun
Plywood	Yamunanagar
Food processing	Kundli, Allahabad, Bhubaneswar
Glass, ceramics and refractories	Virudhachalam, Khurja, Firozabad

Discussions during the last meeting: Action points for the Secretariat

- Finalizing 'MSME map of India' and upload MSME energy map on SAMEEEKSHA website http://www.sameeeksha.org/
- Strengthen map with more cluster level information
- Link SAMEEEKSHA website to other programs
  - *Listed on knowledge management section of CTCN website*
  - *Linked with the World Bank-GEF project website www.indiasaveenergy.in*
  - *To be linked with 'UNIDO Cleanovators Program'*

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SAMEEEKSHA Website (www.sameeeksha.org)

- Updated/uploaded information/knowledge products:
  - Cluster profiles/project briefs (3)
  - Knowledge products (5)
  - SME News
  - Latest events towards promoting EE in SMEs
  - Videos

- Hosts contents such as cluster manuals/ profiles, detailed project reports, energy audit reports, case studies, project briefs, brochures, access to newsletters, videos prepared on EE interventions.

MSME Energy Map of India

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SMALL AND MEDIUM ENTERPRISES: ENERGY EFFICIENCY KNOWLEDGE SHARING
A PLATFORM FOR PROMOTING ENERGY EFFICIENCY IN SMEs

MSME Energy Map of India

Search

Energy intensive MSME sectors
Select Category

States
Select State

Energy consumption
Select Energy consumption

Organizations
Select Organizations

Submit

Advanced Search

Search clusters by products

Food processing	Select
Glass and ceramics	Select
Light engineering	Select
Foundry and forging	Select
Chemicals	Select
Textiles	Select
Others	Select

Search

Foundry sector interventions

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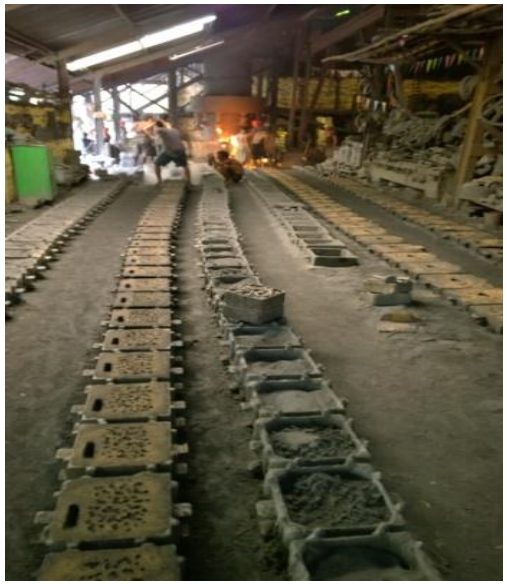
- **Focus clusters**
  - Rajkot - Energy audits
  - Howrah - Best Operating Practices (BOP)

Technical support for identification and implementation of ECMs



Promoting Energy Efficiency in SMEs
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Energy conservation measures

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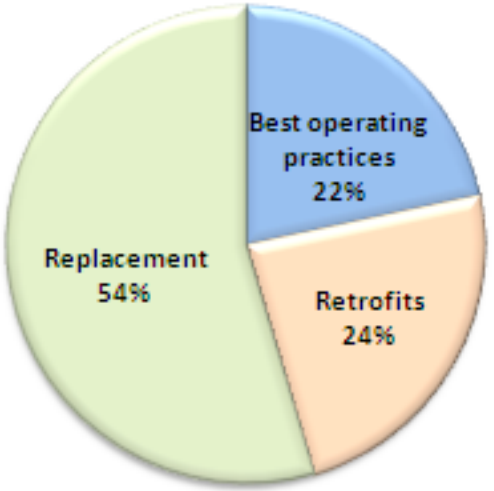
Type	Paybacks
Best operating practices	No investments/ Short term returns (<1 year)
Retrofits	Medium term returns (1-2 years)
Revamps	Long term returns (> 2 years)

- **80 foundries identifying about 900 ECMs**



Energy saving potential

Examples

ECMs implemented in the clusters

EE Induction furnace

Creating Innovative Solutions for a Sustainable Future

Before
SEC : 636 kWh/t

After
SEC : 588 kWh/t

Savings: 90,000 kWh (Rs 6.5 lakh)
Payback : 3.1 year

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Furnace performance optimisation

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Before

Cycle time : 104 min/batch
SEC : 980 kWh/t

After

Cycle time : 70 min/batch
SEC : 676 kWh/t

Savings: 134,000 kWh (Rs 9.1 lakh)
Payback : Immediate

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Relining of shell baking furnace

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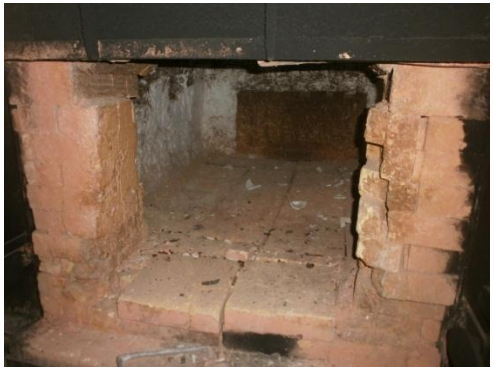
Before

Temperature : > 80-103 C



After

Relined furnace
Reduced heat losses
Temperature : 50-55 C

Savings: 600 kg LPG (Rs 0.6 lakh)
Payback : 1.5 year

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VFD system in air compressor

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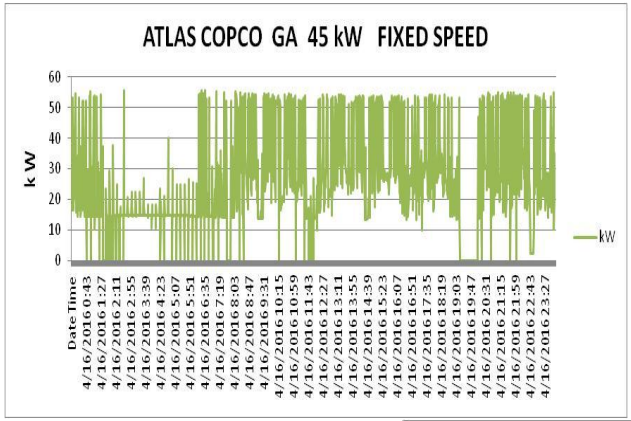
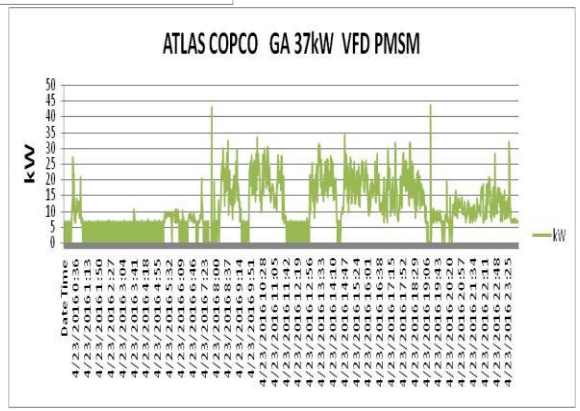
Before

Screw compressor without VFD



After

EE screw compressor with VFD and Permanent Magnet Synchronous Motor



Savings: 39,000 kWh (Rs 2.5 lakh)

Payback : 1.5 year

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Air compressor - Sequence control

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Before

No control for operation of compressors

After

Sequence controller

Savings: 21,000 kWh (Rs 1.4 lakh)

Payback : 1.4 year

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EE pumps

Creating Innovative Solutions for a Sustainable Future

Before

Inefficient pumps – raw water, soft water (coil cooling), DM water (panel cooling)

After

EE pumps

Savings: 11,000 kWh (Rs 0.8 lakh)

Payback : 0.7 year

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Replacement of re-winded motor

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Before

The blower motor of cupola was re-winded 6 times

After

Motor was replaced with IE2 motor

Energy saving : 13%

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Slag quality improvement

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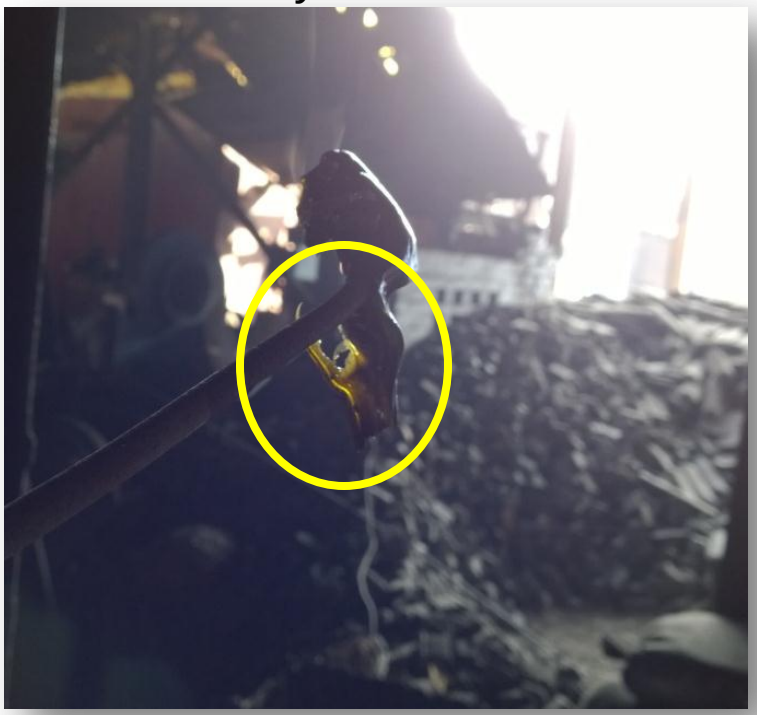
Before

Improper charging practice (bed coke, charge and booster coke)

After

Practices were linked to bulk density of the coke



Melt rate increased by 16%

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Air compressor – set pressure optimisation

Creating Innovative Solutions for a Sustainable Future

Before

Set pressure – 7.8 bar

After

Optimised pressure – 6.5 bar

Savings: 4,400 kWh (Rs 0.3 lakh)

Payback : Immediate

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Air leakage from tuyeres

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Before

About 20% air leakage observed from tuyeres

After

Modified tuyere cover to plug air leakage

Energy saving - 5%

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Minimising bends in compressed air network

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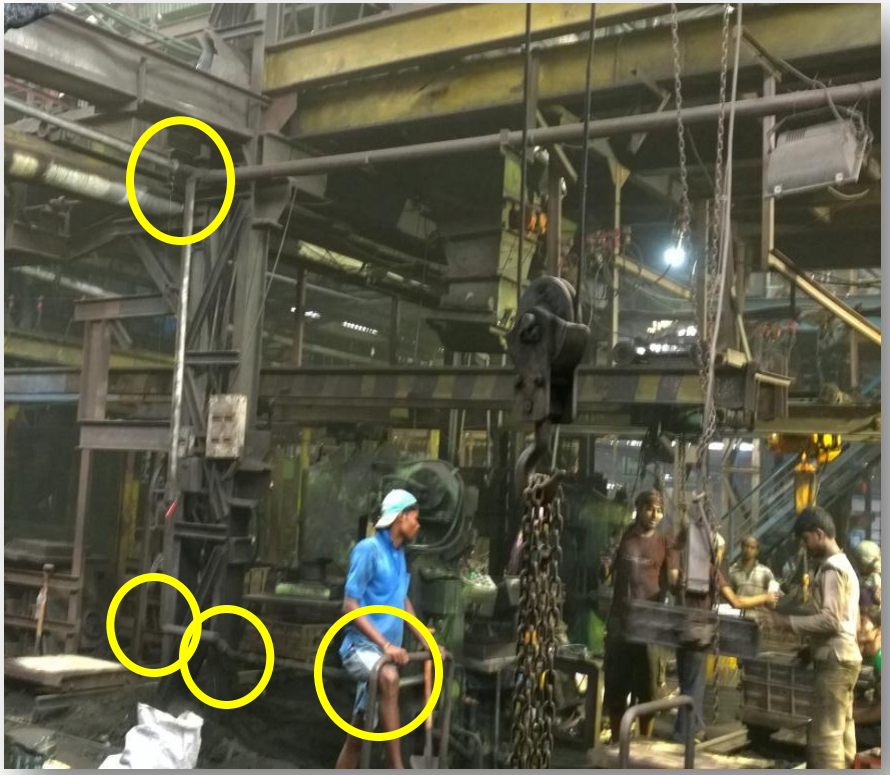
Before

Multiple bends were observed in compressed air network



After

Network piping was modified to reduce bends

Energy saving 3%

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Belt replacement

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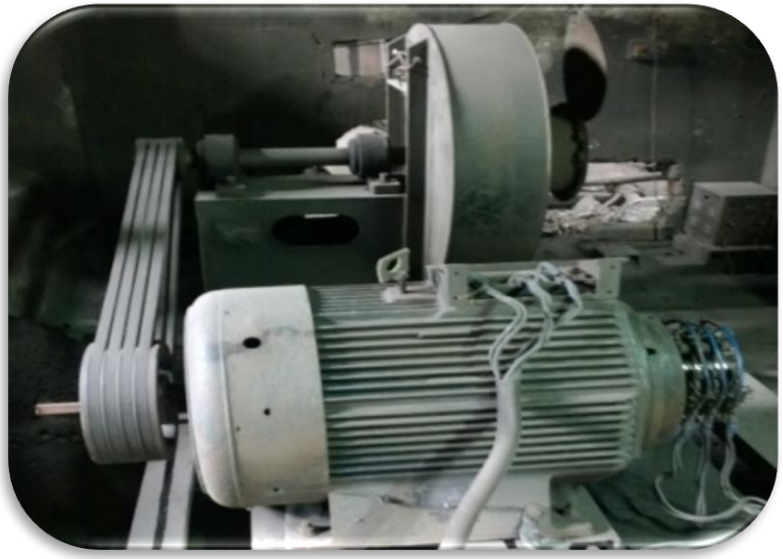
Before

Conventional V-belt coupling motor with blower



After

Replacement with cogged V-belt

Transmission efficiency increases by 3–5 %

Project impacts

Creating Innovative Solutions for a Sustainable Future

Particular	Unit	Identified
Number of units		79
Number of ECMs	No's.	877
Investments	Rs lakh	700
Annual energy savings	toe/year	1633
Energy cost savings	Rs lakh/year	911
Lifetime CO_2 reduction	tonne CO_2	11331

About 25% of ECMs have already been implemented in different units
With technical support from the project

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Discussion points

- Themes for upcoming newsletter issues
- Popularizing MSME Energy Map of India
- Contribution of other members for SAMEEEKSHA website

SAMEEEKSHA looks forward to your enthusiastic participation in strengthening the Indian MSME sector!

Thank You

SAMEEEKSHA Secretariat