



## Clean Energy Finance and Investment Roadmap

Notes and draft agenda for Workshop 1: energy efficiency finance for MSMEs

Contacts: **Mr. John Dulac** ([john.dulac@oecd.org](mailto:john.dulac@oecd.org)) and **Ms. Poonam Sandhu** ([psandhu@nrdc.org](mailto:psandhu@nrdc.org))

## Energy efficiency in India: background and context

Energy efficiency was highlighted in India's 2016 nationally determined contributions, contributing up to 56% of India's commitment to reduce emissions intensity by 33-35% over 2005 levels by 2030. Prime Minister Shri Narendra Modi announced intentions at COP 26 to increase this carbon intensity target to [45% reduction](#) by 2030. To ensure energy efficiency activities are aligned with this commitment, the Bureau of Energy Efficiency (BEE) developed a strategic plan, Unlocking National Energy Efficiency Potential (UNNATEE), in 2017. This laid a framework for the Roadmap of Sustainable and Holistic Approach to National Energy Efficiency (ROSHANEE) to 2031, which will expand and strengthen the 2011 National Mission for Enhanced Energy Efficiency (NMEEE).

ROSHANEE comprises 12 strategic areas with subsequent programmes and activities. This includes a strategic focus on small and medium enterprises (SMEs) as well as activities under other programmes such as the Perform, Achieve and Trade (PAT) scheme, whose proposed expansion would help to address energy conservation and efficiency in certain SME segments.

ROSHANEE and the SME focus also build upon initiatives such as the BEE SME programme launched in 2009, which focused on accelerating the adoption of energy-efficient technologies and practices in energy-intensive segments. Activities under the programme included 100 technology demonstration projects in five SME sectors as well as preparation of cluster manuals, awareness raising, knowledge sharing and technical support ([BEE, 2021](#)).

SN	Area	Programme	Broad Activity
3	Small & Medium Enterprise	SME cluster programme for Energy Efficiency	Promotion of innovative demo projects and capacity building of SMEs
		Low Carbon technologies	Promotion of innovative low carbon technologies in the SME cluster
		Brick Kilns	Market transformation for energy efficient bricks
		SAMEEEKSHA	Knowledge sharing and synergizing the efforts of various organizations and institutions

## The case for energy efficiency in MSMEs

India's energy efficiency investment potential is estimated to be around USD 111 billion by 2031, much of which is concentrated in the industrial sector ([BEE, 2019](#)). Micro, small and medium enterprises (MSME) constitute more than 90% of all industrial units in India, playing a critical role in the overall economy ([TERI, 2021](#)). MSMEs have a high degree of heterogeneity and are broadly classified by Ministry of MSME [definitions](#) (updated in July 2020) as:

Revised Classification applicable w.e.f 1st July 2020			
Composite Criteria: Investment in Plant & Machinery/equipment and Annual Turnover			
Classification	Micro	Small	Medium
<b>Manufacturing Enterprises and Enterprises rendering Services</b>	Investment in Plant and Machinery or Equipment: Not more than Rs.1 crore and Annual Turnover ; not more than Rs. 5 crore	Investment in Plant and Machinery or Equipment: Not more than Rs.10 crore and Annual Turnover ; not more than Rs. 50 crore	Investment in Plant and Machinery or Equipment: Not more than Rs.50 crore and Annual Turnover ; not more than Rs. 250 crore

There were around 5.5 million MSMEs registered in India as of November 2021 under the [Udyam](#) registration system launched in July 2020 ([MSME, 2021](#)). Yet, Udyam registered enterprises are only a fraction of the roughly 64 million MSME units in India, which employ over 110 million people and contribute to about 28% of India’s gross domestic product ([BEE 2020](#)).

Altogether, MSMEs contribute to more than 45% of industrial output and around 40% of the country's exports in value added ([BEE SME portal](#)). Whilst individual energy consumption can be rather low, collective MSME energy use represents the equivalent of around 50 million tonnes of oil equivalent (Mtoe) annually, or roughly the total final energy consumption of Argentina in 2020 ([IEA, 2021](#)). This consumption is expected to increase by a projected annual growth rate of 6% over the coming decade if MSMEs continue to rely on low efficiency technologies and poor operating practices ([BEE, 2021](#)).

MSME units in India are typically characterised by geographical and industrial clusters representing various energy-intensive sectors like foundries, refractories, metallurgy, brass, brick, glass, ceramics, textiles, dyes, chemicals and processed foods. These clusters can depend on obsolete and energy-intensive technologies that result in high energy consumption. For instance, less than 5% of electric motors sold in the Indian market in 2015 were at IE3 level or better ([TERI, 2017](#)). Use of these less efficient technologies impacts profitability and competitiveness. In fact, energy-intensive operations can result in disproportionately high costs per unit of energy consumed, making MSMEs vulnerable to fluctuations in energy prices ([CEEW, 2018](#)).

Table 1: Energy cost across key energy-intensive sectors

Sector	Energy cost as a share of total manufacturing cost
Forging	50 %
Foundry	50 %
Die casting	35 %
Ceramics	35-40 %
Moulding	12-50 %
Sheet metal	12-28 %
Textile dyeing	10 %

Source: [CEEW, 2018](#)

Overall, energy efficiency adoption by MSMEs is low, and there are huge opportunities to tap into the estimated USD 103 billion clean tech market potential for MSMEs ([CII, 2020](#)). For example, a TERI-Shakti project to promote adoption of IE3 motors in the Ankleshwar chemical cluster in Gujarat found that savings of 5% could easily be obtained by upgrading and replacing existing motors. If integrated with systems like variable frequency drives and soft starters, the savings would increase to 10-15%

([TERI, 2017](#)). Wider observations estimate that energy consumption across MSMEs could be reduced by 20-30% through adoption of these types of known energy efficiency measures ([Shakti, 2017](#)).

## MSME barriers and needs for energy efficiency investment

Many MSME segments have not seen large-scale adoption of energy-efficient technologies, in part because financing continues to be a grey area ([BEE, 2021](#)). Smaller operations and a smaller capital base means MSMEs typically do not have access to affordable financing ([AEEE, 2021](#)). In fact, self-financing was listed as the major source of financing for both capital and operational expenses for a majority of enterprises ([CEEW, 2018](#)). MSMEs looking for financing also often feel that their project loan proposals get rejected due to lack of requisite collateral or guarantees ([Shatki, 2017](#)).

This is compounded by a number of other barriers that contribute to low adoption rates, such as lack of awareness and limited knowledge of energy-efficient technologies ([CII, 2020](#)). In cases where there is awareness, incentive to undertake energy efficiency improvements is often limited, unless such investments are directly linked to production capacity ([Shatki, 2017](#)). Capacity to carry out energy audits is another challenge. One study on the factors influencing uptake of energy efficiency in MSMEs found that whilst 56% of surveyed enterprises monitored and recorded their energy use, only 35% had actually conducted an energy audit within the previous three years ([CEEW, 2018](#)).

Many MSMEs also lack technical expertise or capacity to fulfil project preparation and documentation requirements for financing ([BEE, 2020](#)). Lack of knowledge about the process to avail of financing (e.g. through government schemes) is another a barrier for many MSMEs. In fact, a budgetary analysis of the Technology & Quality Upgradation Support for MSMEs (TEQUP) found that around 71% of the funds went unused ([CEEW, 2018](#)).

Commercial banks and non-banking financial companies (NBFCs) also lack sufficient awareness and capacity to apply energy efficiency financing concepts (e.g. technical risk factors in the appraisal process) ([BEE, 2021](#)). Financial institutions are also reluctant to provide cash flow-based project finance for energy efficiency projects This is due, in part, to lack of data (e.g. on asset performance), which influences willingness to lend to energy efficiency projects. Other factors, such as hedging costs for international finance, can likewise influence capital flows for energy efficiency.

Absence of comprehensive data on energy consumed in the roughly six thousand MSME clusters in India also hampers efforts to improve energy efficiency uptake in MSMEs ([CEEW, 2018](#)). Efforts such as a 2012 benchmarking and data mapping of 36 MSME clusters across India helped to assess energy savings potential from specific energy-efficient technologies, but work is still needed to track MSME energy consumption to inform energy efficiency opportunities ([TERI, 2012](#)). Access to data and sharing of success stories also can be an issue to encourage replication of energy efficiency measures in other MSME units ([Shatki, 2017](#)).

## Support and financing of energy efficiency investment in MSMEs

To help address these barriers, BEE and TERI launched a collaborative platform for Small and Medium Enterprises Energy Efficiency Knowledge Sharing ([SAMEEKSHA](#)) to pool knowledge and information that supports efforts by different organisations working towards the common goal of promoting

adoption of energy-efficient technologies and practices in MSMEs ([BEE, 2021](#)). Industry can interface with technology specialists, research institutions, government bodies, training institutes, funding agencies and academia through the platform. The platform also enables like-minded organisation to co-ordinate activities ([TERI, 2020](#)).

BEE also created Energy Conservation [Guidelines for the MSME sector](#) to help adopt best available technologies and operating practices. The Confederation of Indian Industry (CII) similarly provides [sector-specific analysis, manuals and benchmarking information](#), and a [JICA-sponsored MSME Energy Saving Project](#) produced a [list](#) of energy-efficient technologies and technical specifications for MSMEs. A list of more than 150 efficient technologies was likewise prepared by BEE and recommended to the Ministry of MSMEs for the Credit Linked Capital Subsidy Scheme ([BEE, 2020](#)). 50 [multimedia tutorials](#) on energy-efficient technologies were also developed for more than 20 energy-intensive MSME segments, and a knowledge portal, Simplified Digital Hands-on Information on Energy Efficiency (SIDHIEE), was launched in 2019 ([BEE 2019-20](#)).

Similar efforts have worked to address awareness and technical capacity to implement energy efficiency measures in MSMEs. For example, an agreement was signed between BEE and the Office of the Development Commissioner of the Ministry of MSME in 2019 for joint implementation of activities “Promoting Energy Security of MSME sector” ([BEE, 2021](#)). The programme, which includes energy mapping in nine energy-intensive MSME sectors (foundry, forging, steel, glass & refractory, paper, chemical, bricks, pharmaceuticals and dairy), builds upon the BEE “National Programme on Energy Efficiency and Technology Upgradation of MSMEs” created in 2007 to accelerate adoption of energy-efficient technologies ([AEEE, 2021](#)). Achievements included five demonstration projects in the textile, brick and food clusters, as well as 21 pilot projects in four further clusters. Energy savings were estimated at 1.2 Mtoe, representing emissions reduction of nearly 4 000 tonnes of CO<sub>2</sub>.

Other initiatives have looked to address the financial barriers to energy efficiency in MSMEs. One such example is the 2016 BEE [market assessment](#) that led to the creation of two financial instruments under the Framework for Energy-Efficient Economic Development. One is the Partial Risk Guarantee Fund for Energy Efficiency (PRGFEE), which is a risk-sharing mechanism that provides partial coverage (up to 50% of the loan or Rs. 10 crores [USD 1.3 million], whichever is less) to partner financial institutions. The second, a Venture Capital Fund for Energy Efficiency (VCFEE), will support energy efficiency investment through last-mile equity (limited to 15% of total equity required or Rs 2 crore [USD 270 thousand], whichever is less) via a special purpose vehicle ([BEE 2020](#)).

These new funds build upon the Partial Risk Sharing Facility (PRSF) launched in 2015 under the Small Industries Development Bank of India (SIDBI). PRSF provides guarantees (through USD 25 million from the Clean Technology Fund alongside USD 12 million from the Global Environment Facility [GEF]) to 14 participating financial institutions, covering a share of default risk from loans to energy efficiency projects implemented by 18 approved ESCOs via energy savings performance contracts ([BEE, 2021](#)). PRSF also includes technical assistance and had guaranteed over USD 18 million in energy efficiency projects by March 2020 ([SIDBI, 2020](#)).

In addition, SIDBI provides a [knowledge repository](#) for MSMEs as well as several [financial products](#) for energy efficiency projects in MSMEs, for instance through [SIDBI Venture Capital Limited \(SVCL\)](#). Funds focus on themes including start-ups and early stage technology businesses, manufacturing MSMEs,

service entities and agricultural businesses. SIDBI can also provide credit guarantees, microfinance, SME ratings, technology support, and use of fund-of-fund support for venture capital funds.

These MSME finance initiatives are complemented by other government funds such as the:

- Technology Upgradation Fund Scheme (Ministry of Textiles)
- Scheme for Technology Upgradation/Establishment/Modernisation for Food Processing Industries (Ministry of Food Processing Industries)
- Financial support under the Zero Defect - Zero Effect scheme (Ministry of MSMEs)
- Credit Linked Capital Subsidy Scheme for Technology Upgradation (Ministry of MSMEs)
- Technology & Quality Upgradation Support for MSMEs (Ministry of MSMEs).

State schemes, for example in Gujarat, Tamil Nadu and Madhya Pradesh, also exist ([BEE, 2021](#)).

Multilateral support through the GEF has likewise supported energy efficiency uptake by MSMEs, for example under two projects with BEE and Energy Efficiency Services Limited (EESL). One, the GEF-5 “UNIDO-MSME-EESL project on promoting market transformation for energy efficiency in MSMEs”, identified ten energy-intensive clusters for demonstration of 35 energy-efficient technologies that EESL will explore for demand aggregation through an ESCO financing model ([AEEE, 2021](#)). The three-year project is anticipated to save as much as 110 Mtoe of energy, leveraging the USD 31 million GEF grant through an Energy Management Revolving Fund to enable financing beyond the project.

A GEF, World Bank and BEE project created a revolving fund in 2015 to promote “Financing of energy efficiency in MSMEs” through concessional interest rates ([BEE, 2021](#)). The programme also worked to build capacity and awareness for energy efficiency in several sectors (e.g. forging, chemical and foundry industries) ([BEE, 2019](#)). Over 630 firms benefitted from the fund, and interventions carried out between 2015-19 led to about 12 Mtoe of annual energy savings in 2019 ([AEEE 2021](#)). Additionally, more than 1 250 investment-grade detailed project reports were developed through energy audits, which help to justify financing the energy efficiency investments ([BEE 2020](#)).

A GEF, United Nations Industrial Development Organisation (UNIDO) and BEE project on “Promoting Energy Efficiency and Renewable Energy in Selected MSME Clusters in India” also worked to support a market environment for energy-efficient technologies in energy-intensive applications ([BEE, 2021](#)). The project was initially operational in five sectors (brass, ceramics, dairy, foundry and hand tools) in 12 MSME clusters, using a GEF grant of USD 7 million and co-financing of USD 26 million. Detailed energy audits, technology identification, capacity building and implementation assistance were provided, alongside training, monitoring and dissemination activities to aggregate demand and replicate experiences ([Deevela, 2019](#)). The programme has since been scaled up to the national level, and lessons learned from the first phase (e.g. from energy audits and energy management activities) are being used to fast-track implementation of clean energy measures ([BEE 2020](#)).

Other past programmes have included bilateral support, such as the financial assistance offered by KfW and SIDBI through a line of credit offered to MSMEs until December 2019 for energy efficiency investments ([AEEE, 2021](#)). Assistance for equipment, technologies or process improvements under the scheme was provided for a minimum of Rs. 10 lakhs (about USD 13 500) over a maximum period of seven years with interest 1% below the normal lending rate.

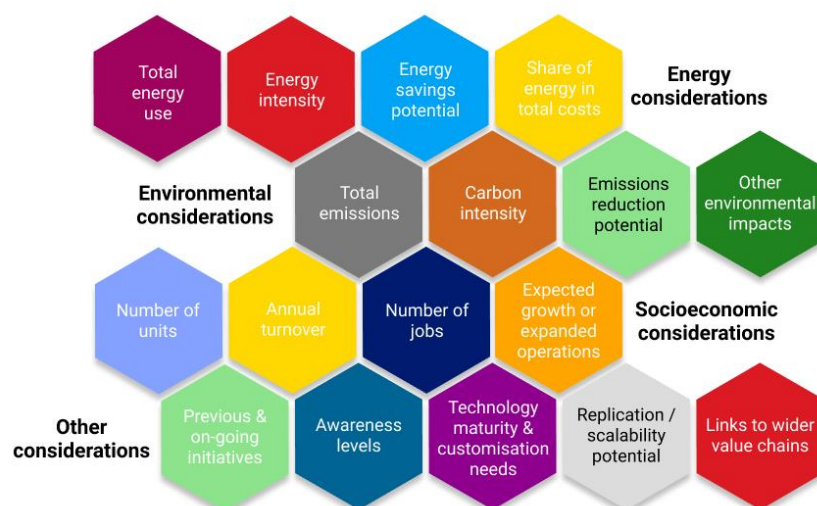
## A Roadmap to improve finance and investment in energy efficiency

Enormous opportunity exists to spur green growth through energy efficiency in MSMEs, not only realising positive impacts on climate but also enabling economic multiplier effects through increased productivity, competitiveness and skilled labour creation.

Previous initiatives have taken various approaches to addressing this opportunity, given the considerable size, heterogeneity and spread of MSMEs across the country. Focus on geographic clusters of particular industries has been one effective approach ([IPEEC, 2015](#)), although awareness and uptake of energy efficiency across clusters or by similar units in different locations is still a challenge. Capacity building and dedicated finance (e.g. by multilateral partners) have similarly helped to increase familiarity and investment in energy-efficient technologies, but these have not necessarily led to replication once initiatives or financial support have concluded.

Development of a *Clean Energy Finance and Investment Roadmap* can build upon these experiences and lessons learned to help to unlock opportunities for energy efficiency measures in MSMEs. Bringing together government and stakeholders, the Roadmap will develop an action plan that identifies and addresses critical bottlenecks in order to develop tailored financing solutions and suitable investment vehicles that can help to scale up energy efficiency deployment and replication across MSMEs.

As needed, the Roadmap will also consider policy and other factors influencing MSME energy efficiency considerations. This includes the potential energy savings and environmental impacts, for example looking at clusters or segments with the highest energy intensity or with the biggest impact on emissions reduction. Other considerations include socioeconomic impacts, for instance in terms of the number of potential MSME units, annual turnover or the number of persons employed. Expected need for energy efficiency in order to adapt to evolving domestic and global value chains is another potential influencing factor.



## Final agenda (14 March – online Zoom event)

15h00 (IST) Welcome address & remarks *Director of OECD Environment Directorate, Dr. Rodolfo Lacy*

15h10 Energy efficiency in MSMEs *Shri. R.K. Rai, Secretary, BEE*

*Short presentation setting the scene for discussion*

15h30 CEFI Roadmap *Mr. John Dulac & Ms. Chetna Hareesh Kumar, OECD*

*Overview & recap of stakeholder consultations on challenges and opportunities*

*Group poll: priority setting*

16h00 Group discussion: identifying solutions and targeting interventions

*Moderator: Mr. John Dulac, OECD*

*Mr. Giresh Sethi, TERI*

*Mr. Bhaskar Natarajan, AEEE*

*Mr. Rhudi Pradhan, CEEW*

*Mr. Girja Shankar, EESL*

*Suggested framing questions for group:*

- a. How can previous/existing initiatives and support be expanded/evolved/adapted?  
Are new approaches/solutions needed?
- b. What can enable greater continuity/impact/replication of solutions (e.g. to continue improving awareness & capacity across MSME segments / clusters)?

17h00 Group discussion: actions to unlock energy efficiency finance and investment

*Moderator: Ms. Poonam Sandhu, NRDC*

Opening remarks:

*Mr. Arijit Sengupta, BEE*

*Mr. Sunil Sharma, Darashaw*

*Mr. R.K. Singh & Rajiv Mr. Kumar, SIDBI*

*Mr. Mudit Jain, Tata Cleantech*

*Mr. Ranama Reddy, kfW*

*Suggested framing questions for group*

- a. What actions can increase and/or improve financial offerings for MSME energy efficiency?
- b. What can help to overcome gaps to financing (e.g. ticket size, project documentation & standardisation, payment risks, knowledge and data of asset performance)?
- c. Is there need for new financial instruments (e.g. energy savings insurance) or business models?
- d. Where can international support (e.g. technical assistance for project preparation & development, concessional funds via development/climate finance) improve MSME efficiency finance and investments? Is blended finance needed, and if so, how can this be applied to support robust market development?

18h00 Concluding remarks & next steps

*Ms. Cecilia Tam, OECD*