



Climate change and MSMEs in India: Policy prescriptions to a low carbon pathway

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Abstract

The Micro, Small and Medium Enterprises (MSMEs) sector in India although promulgates an inclusive growth and ensures economic stability in terms of its contribution to the country's gross domestic product (GDP) and creation of large-scale employment opportunities, it is also one of the key contributors to the country's green house gas emission levels. Efforts are directed towards greening of MSMEs so as to lessen their sensitivity to climate change. But to achieve this vicissitude successfully, the support of climate finance cannot simply be overlooked. However, the irony is that access to climate finance has largely remained beyond the reach of the deserving entrepreneurs.

Keywords: MSMEs, climate change, GDP, entrepreneurs

Introduction

The Micro, Small and Medium Enterprises (MSMEs) play a pivotal role especially in the economies of the developing countries. As per World Bank estimates, MSMEs globally make up a significant chunk of trade and act as job providers to a vast section of the universal population and thereby foster an all-inclusive economic development. Not only they contribute to a whopping 90% of business but also guarantee more than 50% of recruitment universally (The World Bank, 2021) ^[34], (UNCTAD, 2020) ^[37]. According to the International Organization of Employers (IOE), the number of MSMEs in developing nations is approximately (365-445) million (IOE, 2022) ^[23]-making an overwhelming contribution to the extent of 50 percent in the national income of developing nations. Furthermore, the inclusion of informal MSMEs magnifies its share ascertainably. The World Bank data reveals that there is a need to create 600 million additional jobs all over the world so as to absorb the expanding workforce (CII, 2022) ^[8]. The MSMEs in some of the world's fastest growing economies are said to be the largest generators of formal job opportunities. The International Labour Organization (ILO) data suggests that micro and small enterprises add up to 70 percent of employment worldwide and this in turn makes development of SMEs absolutely crucial for countries around the world (ILO, 2019) ^[22]. In addition, evidence from an ILO Sustaining Competitive and Responsible Enterprises (SCORE) Programme which aims to improve the productivity and working conditions in SMEs further corroborates the importance of this sector in the global economy. Needless to say, that all these facts and figures establish beyond doubt that MSMEs do make a difference and their existence in the economy cannot simply be shrugged off.

In India, the MSME sector is a predominant sector that creates good employment prospects with minimal capital expenditure vis-à-vis the large industries. This is evident from the statistics retrieved from Udyam Registration portal which reveals an increase in the total number of persons employed in MSMEs from 65,64,458 in 2019-2020 to 84,23,452 in 2022-2023 (up to 07.12.2022) (Ministry of

Micro, Small & Medium Enterprises, 2022) ^[27, 28]. According to the statistics from Ministry of Statistics and Programme Implementation, the percentage share of MSME Gross Value Added (GVA) in all India GDP is 26.83 for the year 2020-2021. Estimates from the Directorate General of Commercial Intelligence and Statistics reveal that the percentage share of export of MSME related products in all India export lies at 42.67 for the year 2022-2023 respectively. The percentage share of manufacturing MSME GVA in all India manufacturing GVA is 38.47 for the year 2020-2021 ^[25] respectively (Ministry of Micro, Small & Medium Enterprises, 2022) ^[27, 28].

Despite the huge contribution of MSMEs in social and economic development of the country, yet there is no denying of the fact that MSMEs alone are responsible for emission of 110 million tonnes of CO₂ equivalent in 2015-2016 (Upadhyay, 2022) ^[39]. Climate change and MSMEs is often argued to share a bilateral relationship. On one hand, MSMEs are exacerbating climate crisis while on the other hand, they are themselves susceptible to its threat (TERI, 2022) ^[33]. Though emission statistics of MSMEs may vary, yet, various scientific reports and literature are unambiguous of the fact that they are a massive energy intensive sector consuming about 85% of thermal energy which in turn signifies the sector's substantial reliance on non-renewable energy sources (Energy World, 2022) (Ministry of Power, 2012) ^[29]. Reports have pointed out that in India, MSME sector gobbles up about (20-25) percent of gross energy consumed by the large industries and out of the total energy consumed in MSME, the share of electricity is around 15 percent (Federal Ministry for the Environment, Nature Conservation and Nuclear Safety, 2018) (IEA, 2021) ^[17, 18]. These reports, in addition, forecasted a surge in energy consumption of MSMEs from about 30 million tonnes of CO₂ equivalent in 2016-2017 to about 72.17 million tonnes in 2029-2030. Estimates from another study have revealed that in the year 2015-2016, this sector absorbed around 13 percent (81 million tonnes) of total coal or lignite, 7 percent (8.5 million tonnes) of petroleum products and 8 percent (3.3 billion cubic metres) of natural gas that is procured by India (CSTEP, 2018) ^[9].

While the above facts and figures reflect only one side of the story, the other side is that the MSMEs are at extreme threats emanating from a changing climate. These climate change induced threats to business (like destruction of infrastructure and property, market ups and downs, obstacles in meeting financial obligations, deranged production and supply systems etc.) not only jeopardize the smooth functioning of the MSME sector but also create a massive and instantaneous requirement of financial backing. Against this backdrop, adoption of clean technologies by MSMEs is of paramount importance as this will play a key role in reducing their carbon foot prints and make them less amenable to climate change. Herein, lies the importance of climate finance. India with the largest MSME structure in the world is immediately behind China and is one of the most zestful sectors of the economy (Cyrill, 2022). Hence, its roles and responsibilities in fulfilling climate change related pledge and obligations are quite obvious. By shifting to a low carbon paradigm, the MSMEs shall be able to make an active contribution in meeting climate change related commitments and subsequently prune the negative repercussions of a changing climate. This in turn will help them enhance their competitiveness in the international market and unveil its true growth potential. This paper, by reviewing reports and scientific literature existing in the realm of small business and climate change tries to bring out the focal points of the various government initiatives to lead the way to a low carbon regime. Also, the paper tries to make a brief comment on climate finance for Indian MSMEs. Section 2 highlights the different actions taken so far to shift Indian MSMEs to a low carbon and environmentally sound hegemony. Sections 3 and 4 focus on the role of Zero Defect Zero Effect mechanism as an emission mitigation technique and India's position in climate finance and MSME sector. Section 5 makes a comment on the the role of SIDBI in green finance procedure with section 6 making the concluding remarks.

Initiatives to shift Indian msmes to a low carbon trajectory

India in its updated Nationally Determined Contribution (NDC) has set the twin precise goals to curb the emissions intensity of India's GDP by 45 percent by 2030 and to achieve about 50 percent cumulative electric power installed capacity from non-fossil fuel-based energy resources by 2030 (Kulkarni, 2022) [24]. According to the NDC, this will be truly instrumental in achieving the net zero emission target by 2070. The Ministry of Power has set up a high-level committee to organize transmission system that is needed for having 500 GW of non-fossil fuel based installed capacity by 2030 (Ministry of Power, 2022) [30]. Since MSMEs in India are still engaging outdated technology-outcome of which is higher energy intensity, hence their involvement towards depletion of emission intensity is of supreme importance (BUR, 2021) [5]. To remove the impediments that come in the way of bringing energy efficiency through technology upgradation in MSMEs, the government has initiated a host of measures, the main highlights of which are as follows (BUR, 2021) [5]:

- Enhancement of training and capacity building programmes- This includes empowering of training delivery institutions.
- Enhancement of skills- This encourages prompt employment creation with improved growth prospects.

- Foster adoption of clean and emerging technologies- This will scale up the quality of products in addition to emission intensity reduction.
- Invigorate innovation- This includes establishment of business incubators so as to give very early-stage companies access to mentorship, investors and other logistical support to help them get settled.
- Promote inclusive market-based energy efficiency measures
- Development of markets for energy efficient technologies
- Appropriation of energy efficiency measures with the help of lucrative financial support

The United Nations Industrial Development Organization (UNIDO) has implemented a project "Promoting Market Transformation for Energy Efficiency in Micro, Small and Medium Enterprises" funded by the Global Environment Facility (GEF) with executing agencies being Bureau for Energy Efficiency (BEE), Ministry of Micro, Small and Medium Enterprise and Bureau of Indian Standards (BIS), Energy Efficiency Services Limited (EESL), Small Industries Development Bank of India (SIDBI). The main aims of the project with duration 2015-2024 are to promote a cleaner MSME in India and imbibe more competitiveness in the same and at the same time expedite the adoption of sector specific energy-efficient technologies.

Another project, viz "Financing of Energy Efficiency at MSMEs" implemented in more than 20 clusters in India has been a part of the GEF and was implemented to augment the demand for investments for securing energy efficiency in a few selected MSME cluster. The project which has been completed off late tried to build up capacity so as to gain access to commercially viable sources of finance.

The Union Minister for MSME has launched Knowledge Management Portal "SIDHIEE" (Simplified Digital Hands-on Information on Energy Efficiency in MSMEs) as a part and parcel of the BEE's MSME programme. The objective of the programme is to promote energy efficiency and renewable energy in chosen MSME clusters in India. The portal hosts a very pertinent information like energy efficient technologies, best industrial practices and their accomplishments including fifty videos of multimedia tutorials for MSMEs for early and easy adoption of energy efficient technologies (SIDHIEE, 2021) [32]. There are also designated sections of "Digital Library". This repository provides contact details of technology providers, energy saving financing programmes, list of skilled energy personnel who are adequately trained under the project. They may be approached to get desirable and apt solutions as and when required. The platform facilitates initiation of relevant dialogue with different stakeholders on affairs, difficulties and policy prescriptions that may be instrumental in designing future endeavours. This programme also targets to organize a huge group of "decision ready" units in collaboration with the local industrial associations, energy experts, local service providers and popular vendors of energy efficiency apparatus (SIDHIEE, 2021) [32]. These activities undertaken to create demand for energy efficiency will then be associated with the lending projects of diverse financial institutions in the defined cluster.

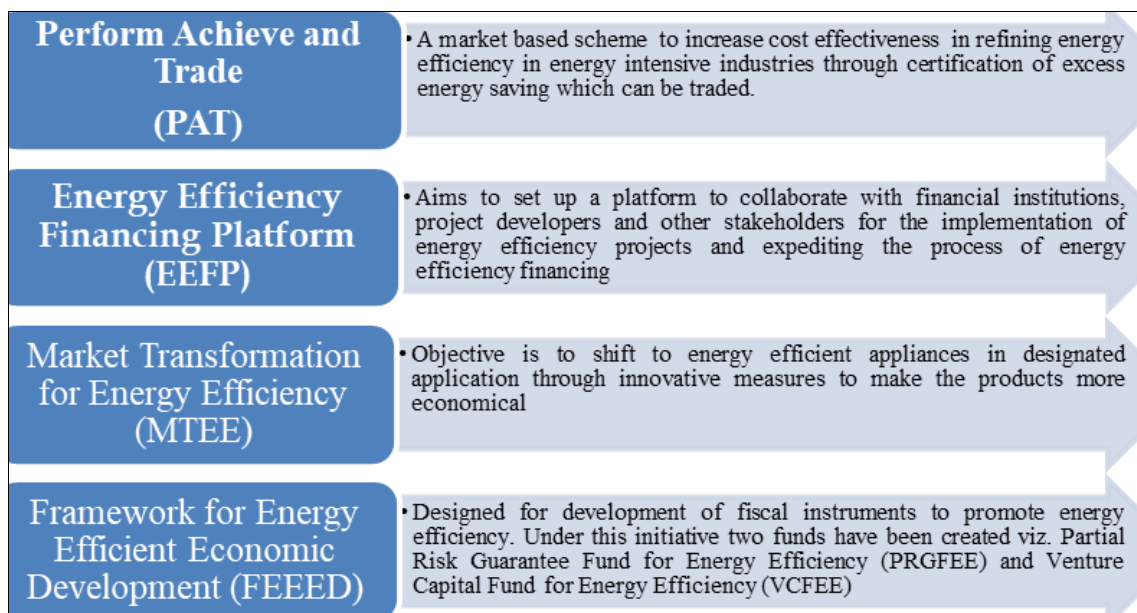
A very significant move taken by UNIDO project viz. "The Facility for Low Carbon Technology Deployment

(FLCTD)”, implemented in association with BEE has been launching of Annual Innovation Challenge. It is an open award competition seeking innovative solutions. The programme points out the technology areas based on diverse technical work and deliberation with experts. Waste heat recovery, pumps, pumping system and motors, space conditioning, industrial IoT, industrial resource efficiency and electrical energy storage are some of the technological fields which fall under the purview of innovation challenge (FLCTD, 2021) [14]. Funding upto USD 50,000 are provided to the ideas that are eligible for qualifying to final round (FLCTD, 2021) [14]. Needless to say, it is a remarkable initiative to help the country move towards an energy efficient path.

The BEE in its strive to hasten energy efficiency in the

MSME sector had initiated a programme “National Programme on Energy Efficiency and Technology Upgradation in SMEs” in the year 2007. The BEE had kick started 21 pilot energy efficient technologies with grants in aid in 4 MSMSE sectors (BEE, 2023). Stakeholders at the cluster levels were toughened to abet synchronization of these technologies across sectors.

The National Mission for Enhanced Energy Efficiency (NMEEE) is one of the 8 missions under the National Action Plan on Climate Change (NAPCC) that seeks to fortify the market for energy efficiency by appropriate policy formulations so as to stimulate ingenious and sustainable business models to the same. The NMEEE has highlighted four broad initiatives to augment energy efficacies in energy intensive sectors (figure1).



Source: (Bureau of Energy Efficiency, 2022) (Bureau of Energy Efficiency, 2022)

Fig 1: Initiatives under NMEEE

Role of zero defect zero effect in emission mitigation

The government of India conceived the Zero Defect Zero Effect (ZED) initiative in a bid to make the MSME sector more competitive in the international market as well as more sustainable so that they can emerge as “National and International Champions”. An uncomplicated and transparent certification process, it is based on some explicit yardsticks viz quality, safety, production, cleanliness, energy, environment and others. ZED certification enables the MSMEs to reduce their wastes significantly and increase their levels of productivity and performance on one hand and at the same time make substantial effort to save energy. ZED scheme among other things, will also prove to be crucial in making the MSMEs environmentally more informed and will ensure optimal usage of natural resources, thereby broadening their markets (Ministry of Micro, Small and Medium Enterprises, 2022) [27, 28]. The Annual Report of the Ministry of Micro, Small and Medium Enterprises 2021-2022 [25] has mentioned that 23948 MSMEs have registered under ZED certification, out of which 503 MSMEs have been certified, 908 industry awareness programmes have been conducted which 43,552 beneficiaries and 3,173 personnel were trained under 117 training programmes (Ministry of Micro, Small and Medium Enterprises, 2021-2022) [25].

Climate finance and msmes: Where does India stand?

The United Nations Framework Convention on Climate Change (UNFCCC) defines climate finance as “local, national or transnational financing—drawn from public, private and alternative sources of financing—that seeks to support mitigation and adaptation actions that will address climate change”. Conventional funds alone are not sufficient to “decarbonize” the MSME sector. Hence climate finance paves the way for transfer of technology and knowhow from developed to developing countries which are in pressing need to confront the perils of climate change. There is an expanding range of literature which has iterated that MSMEs in the emerging economies like India are the most credit starved sector (IFC, 2017) [20]. (Upadhyay, 2022) [39]. (IEEFA, 2022) [19]. According to the Asian Development Bank estimates, while 93 percent of MSMEs lack ingress to outside finance, a slightly higher than 5 percent gets access to institutional sources of credit with 2 percent using noninstitutional finance (ADBI, 2019). The estimates further pointed out that only 11 percent of registered MSMEs can opt for institutional finance. However, a study by the International Finance Corporation Formal sources reveal that the addressable credit gap for MSMEs in India stand at about INR 25.8 trillion (USD 397 billion) with the

micro, small, and medium enterprise gap that can be accounting for INR 8 trillion (USD 123.3 billion), INR 16.8 trillion (USD 258.6 billion) and INR 1 trillion (USD 15.6 billion) respectively (IFC, 2018) [21]. Another report published in 2019 by the UK Sinha Committee constituted by the Reserve Bank of India (RBI) had noted that the overall credit gap in the MSME sector is estimated to be INR 20-25 trillion (INR 20-25 lakh crore) or \$267-334 billion. In view of the fact that a large number of MSMEs in India still struggle hard and have a tough time to get hold of traditional finance, climate finance is still a delusion. Factors like ignorance about the functioning of the entire system of climate finance, dearth of adequate data on climate finance, sub optimal financial knowledge levels, cumbersome paper work involved in the process, stern ordinance pertaining to formal financial services delivery are some of the major roadblocks that add fuel to the fire and worsens the situation further (Gupta & Singh, 2020) [16]. In addition to banks and other institutional sources of finance, monetary resources required for clean energy are also mobilized through state and union budgets, National Adaptation Fund, Clean Development Mechanism, Green Climate Fund, Global Environment Facility etc. Green Climate Fund (GCF), set up by 194 governments acts as a podium to combat the perils of climate change by investing in low carbon and climate resilient development (GCF, 2022) [15]. GCF attempts to channelize finance for MSMEs at each and every stage of growth through MSME pilot programme. However, inadequate capacity development of the entrepreneurs, lack of proper technical advice, tiny size of projects are some of the major bottlenecks that come in the way of proper investment mobilization by MSMEs. Also, MSMEs in most cases need small amount of funds vis-a vis what GCF provides. This inturn deters the MSMEs to procure climate finance directly from GCF and other allied sources (TERI, 2022) [33]. There is also an urgent necessity to reconceptualize the involvements of the multiple organizations (like financial, micro finance, and even non-banking financial companies) to facilitate MSMEs' smooth access to climate finance.

Green finance and role of SIDBI

At a time, when practicable options to secure finance are almost obscure, there is an urgent need of prompt government arbitration so that MSMEs can acquire sustainable finance at a decent rate. Introduction of green finance mechanism may be, in this regard, would warrant a comparatively better environmental consequence. Green financing plays an integral role in the battle against climate change and subsequent move to a net zero planet. Hence, its role in ensuring sustainable development is indisputable (Bharati & Patra, 2022) [4]. Put in a lay man's perspective, it is basically a loan/investment in favour of eco-friendly activities. This, among other things, may include picking up ecologically sound merchandise and services, building up green and sustainable infrastructure etc. The MSMEs can get green bond capital through this green finance channel (Trivedi & Jena, 2022) [36]. Similar to any other bond, a debt instrument in a green bond is issued by an issuer to acquire funds from investors. However, what discriminates between an ordinary bond and a green bond is the fact that the receipts of a green bond offering are exclusively reserved for funding "green" projects. The main highlights of the green finance scheme are that it involves provision of term loans in rupee or any foreign currency with the loan amount ranging upto Rs 20 crores for MSMEs and upto Rs 50 crores for service providers subject to affinity with MSME with a repayment period upto 10 years (SIDBI, 2023) [31].

In India, green bonds will be issued for manoeuvring monetary resources in those projects that particularly target to bring down the emission levels and make a progress towards attaining the agenda under National Action Plan on Climate Change (NAPCC).

Small Industries Development Bank of India (SIDBI) has established a separate designated wing with the vision to make the MSME sector climate change resilient. The various financial and developmental attempts undertaken by SIDBI for greening of MSMEs are listed below (table 1):

Table 1: Attempts by SIDBI for greening of MSMEs in India

1.	SIDBI- A bonafied agency of Green Climate Fund	<ul style="list-style-type: none"> ▪ Channelizes funds to nurture green investments ▪ Extends assistance to other organizations willing to abide by compliance with climate change commitments
2.	Initiation of a project "Swach Kashi, Swavalambi Kashi"	<ul style="list-style-type: none"> ▪ Plastic bottle vending machine is being put into practice in Varanasi ▪ This is connected to waste recycling systems, junk dealers etc. ▪ Similar measure will be taken in Delhi as well.
3.	Technology Information Forecasting and Assessment Council (TIFAC)-SIDBI (Srijan)	<ul style="list-style-type: none"> ▪ Encourages the development of innovative technology projects ▪ Provides concessional loans upto Rs 200 lakh per project which are almost ready for scale up via TIFAC-SIDBI (Srijan) programme ▪ Interest rate ranges between (3-5) percent per annum to the MSMEs and start ups
4.	End to End Energy Efficiency (4E) Scheme	<ul style="list-style-type: none"> ▪ Finances green investments ▪ Provides term loans upto Rs 7.5 crore under normal and medium mode and up to Rs. 1 crore under e-GPS mode
5.	Launching of Green Finance Scheme with a funding corpus and risk sharing facility window	<ul style="list-style-type: none"> ▪ Bolsters up green projects in MSME sector
6.	Development of market for Energy Service Companies (ESCO)	<ul style="list-style-type: none"> ▪ Provides financial and technological support to energy efficiency projects in MSMEs and other industries
7.	Initiation of channels for funding projects with "high impact innovative technology"	<ul style="list-style-type: none"> ▪ Projects are backed with term loans of Rs 25 lakh per project ▪ Coverage of financial obligations pertaining to fees, activities for confirmations etc.

Source: (SIDBI, 2023); (ET Online, 2022)

It is thus quite evident from above that the measures taken by SIDBI to ensure the availability of finance to the MSMEs so that they can make a steady progress towards attaining this green transformation are extremely noteworthy. Furthermore, SIDBI's role in decarbonization efforts by mobilizing capital for green investment and subsequently shifting MSMEs to sustainable business practices become all the more relevant especially when India lacks any designated platform to disburse monetary resources required for transition to a more sustainable and low-carbon economy.

Conclusion

India's MSME sector is undoubtedly the spine of the economy – thanks to the contribution it makes to the country's GDP and employment share. Also, it is a consequential contributor to the emission levels and subsequently to climate change related issues. Hence, the need to make a steady progression of India's MSMEs to a low carbon emanating sector is quite crystal clear. The MSME sector in India needs a massive thrust to embrace new technologies that reduce its carbon foot print and make it less and less exposed to the menace of climate change. No doubt, low carbon choices are being scrutinized even after taking into consideration the very fact that there exists a number of "hard to abate" industries. Though the government has made different policy prescriptions to enable MSMEs accomplish this metamorphosis, yet reliance on conventional sources of fund alone is not sufficient to achieve this goal as the sector faces a massive credit gap. In such a scenario, the role of climate finance is simply unquestionable. Thus, channelizing climate finance to the MSME sector by formulating coherent and well-suited strategies commensurate with the needs of the MSMEs has become the need of the hour. The government should make a sincere effort to unite the MSME sector with a more proper and a well-structured credit delivery system. This, on one hand, will narrow the prodigious credit gap and on the other hand, will also permit the MSMEs to get hold of climate finance. Also, to utilize the finances provided by SIDBI more efficaciously, it is important to bridge the information divide that exists between banks and the MSMEs. This is possible by endorsing technological development along with upgradation of accounting standards to comprehend the pragmatic problems encountered by MSMEs in India. Though MSME's low credit score, could dampen the rating of the green bonds issued by SIDBI, thereby creating a sense of insecurity among potential investors, the government could definitely act as a savior in this regard. It can play a proactive role by stepping in and framing a credit guarantee fund to provide financial support to green activities for MSMEs. A credit guarantee fund may secure provision of green loans for MSMEs without having to bear the additional burden of keeping any security deposits. A strong surveillance by the government and regulatory bodies is also needed to ensure proper implementation of the policies so as to help MSMEs achieve the milestone of a self-sustaining India. Along with this, emphasis should be given on inherently different energy systems by using alternative energy sources like green electricity, green molecules like biofuels so as to achieve rapid decarbonization of the sector. All these will eventually create a conducive environment for India to

achieve its Nationally Determined Contributions and other international climate vows.

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