THEME LEAD

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INTRODUCTION

The strategic importance of Small and Medium Enterprises (SMEs) is acknowledged across the world. In India too, SMEs are an important component of the economy. They contribute to 45 per cent of manufacturing output, 40 per cent of exports, and employ the largest number of people, next only to agriculture. Most SMEs still use conventional technologies and practices that are inefficient. Many energy-intensive applications in sectors such as foundry, forging, glass, textiles, paper, chemicals, and so on have not benefitted from innovation in cleaner technologies. These sectors have been hard-hit after the opening-up of the economy and easy availability of cheaper imported products. Reducing the cost of production has thus become a priority in today's competitive marketplace. Adoption of energy-efficient technologies by SMEs will reduce their operating cost and carbon dioxide (CO_2) emissions. Hence, increased investment in efficient technologies in SMEs is desirable both from the national and global viewpoints.

KEY QUESTIONS

- Technological solutions are not readily available, and there is a need to develop customized solutions to suit specific needs of SMEs. How can innovation (R&D) on energy-efficient technologies be promoted among SMEs?
- How do we accelerate the adoption of energy-efficient technologies in SME sector? How do we engage large industries in this process?
- A significant amount of energy is consumed in utilities like pumps, fans, transformers, etc. that are manufactured in SMEs. How do we promote manufacturing of energy-efficient equipment and phase out the inefficient ones?

KEY CHALLENGES

A vast majority of SMEs in India, especially in the energy-intensive sectors, still uses outdated energy inefficient technologies and practices. In general, energy efficient technology is more expensive compared to conventional or inefficient technology. The higher upfront investment is one the main barriers to adoption of energy efficient technologies by SMEs. Also, very little investments have been made for developing energy efficient technologies for a large number of traditional energy-intensive SME sectors. For such sectors, the absence of ready-made technological solutions commercially is a major barrier. Some of the reasons for the poor uptake of low-carbon technologies in this sector have been the lack of availability of the off-the-shelf cleaner alternatives, little investment in innovation (R&D) of new technologies, low awareness of new technologies which are available commercially, limited in-house

technical capacities to implement change, poor quality of local service providers (LSPs), underdeveloped support institutions, and lack of attractive financial options.

Energy-efficient technologies can be categorized according to their stage of commercialisation—pre-commercial, semi-commercial, and fully commercial. Pre-commercial technologies are those where readymade technological solutions are not available and hence R&D is necessary, e.g., improved waste heat recovery systems for furnaces. Semi-commercial refers to newly developed technologies that have been demonstrated in a limited number of units but have not yet reached commercial maturation or "taken-off", for e.g., an improved furnace design. Fully commercial technologies are those which are available commercially in the market but are yet to reach the saturation level, for e.g., IE3/IE4 electric motors.

OPPORTUNITIES

Efficient technological solutions that are commercially available in developed countries cannot often be used by SMEs in India due to their high upfront cost and scale of operation. The SMEs lack financial and technical capacity to undertake innovation (research and development activities) it is important to undertake development and demonstration projects aimed at providing off-the-shelf efficient technological systems for them. Development of energy efficient technologies for SMEs is not attractive for large engineering firms and consultancies in the private sector. Hence public funding is needed for R&D and demonstration of new energy efficient technologies for a large number of energy-intensive SME sectors. Demonstration of new pre-commercial technologies will help in popularizing these technological options among SMEs. In order to create a delivery system for the demonstrated technology it is important to identify and develop a network of LSPs. The LSPs who can be consultants, fabricators or consultancy organizations, can play an important intermediary role in hand-holding of the units to successfully implement the technology. It crucial to support a new technology for a few years till it has been adopted by a sufficient number of units. Awareness and capacity-building programmes for entrepreneurs, supervisors, operators, and LSPs are important for dissemination of semi-commercial technologies. Energy audits is a proved tool to identify energy savings opportunities at a unit level. SMEs require larger financial assistance to get their units energy audited. Appropriate interventions to support identification, financing, and implementation of energy efficient technologies and practices are need to be formulated for adoption of commercial technologies among energy-intensive SME clusters. The rate of adoption of such technologies can also be accelerated by providing concessional loans for energy efficient technologies to SMEs.

Considering the scale at which SMEs operate, there has to be a significant effort at the national level to develop cost-effective technological solutions

customized to local conditions for them. It is important to develop tailor-made programmes to promote low-carbon technologies among SMEs especially in the context of climate change. A holistic approach which can contribute towards increasing the technological capabilities of the sector as a whole (entrepreneurs, supervisors, operators, and local service providers) is required. The Energy and Resources Institute (TERI), with the support of the Swiss Agency for Development and Cooperation (SDC), has successfully undertaken research, development, demonstration, and dissemination (RDD&D) projects for selected applications in the glass and foundry sectors. The projects have led to strengthening of the technological capacities of the sector stakeholders (entrepreneurs, supervisors, workers, and local service providers) as a whole.

A phased approach to promoting new energy efficient technologies among MSMEs is shown below: