

SMALL AND MEDIUM ENTERPRISES: ENERGY EFFICIENCY KNOWLEDGE SHARING

SAMEEEKSHA

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VISION

SAMEEKSHA 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.



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A PLATFORM FOR PROMOTING ENERGY EFFICIENCY IN SMEs

IN THIS ISSUE...

This issue underlines an opportunity for Indian MSMEs, even in the midst of the crisis precipitated by the coronavirus (Covid-19) pandemic.

As the articles in this issue explain, even as Indian MSMEs prepare to restart operations following the 2½-month nationwide lockdown, this is an opportune time for MSME units to adopt low-cost/no-cost measures that can significantly reduce their energy bills. With weak consumer sentiments and poor market demand post-lockdown, most MSMEs are forced to operate at low capacity utilization leading to liquidity problems. Reducing operating costs and improving resource efficiency can play an important role in these difficult times.

The theme article summarizes the huge challenges confronting India's 63 million MSMEs, which provide direct employment to an estimated 110 million people, contribute nearly 50% to India's exports, and provide vital inputs for a range of major industrial sectors in the country and abroad. The lockdown led to the shutting down of a large number of MSMEs. Restarting the MSME units will mean re-planning and rescheduling of production processes; restructuring of operating practices and worker deployment to comply with the mandatory social distancing norms and other regulations; and so on. These are complex and challenging tasks that entail investments of money, effort and time. It is in this context that the theme article underlines the need for MSMEs to slash production costs and increase their profitability—and highlights best operating practices (BOPs) as the solution. MSMEs can adopt BOPs at little or no cost to achieve significant savings in energy costs and increased profits.

A separate article presents a number of case studies on BOP that have been implemented by MSMEs, to showcase the huge monetary benefits that BOPs bring at little or no investment.



RESTARTING MSME'S POST-LOCKDOWN: OPPORTUNITY AMIDST CHALLENGES

Opportunity exists even during the direst crisis.

So it is for the Indian MSME sector, even as it braces itself to emerge from the nationwide lockdown caused by the coronavirus (Covid-19) pandemic that continues to sweep across India and the world. Almost all of India's 63 million MSMEs had to shut down during the lockdown, which lasted for nearly 2½ months, from 25th March to 31st May 2020. As a consequence, countless millions of people – entrepreneurs, workers, suppliers, equipment manufacturers, technical service providers and others involved in MSME sector—lost their primary sources of livelihood and were plunged into a crisis from which they are yet to recover.

Now, even as the nation has commenced the cautious stage-wise emergence from the prolonged lockdown, the single most important question that MSME entrepreneurs face is: how to resume operations?

Challenges

The challenges for MSMEs are indeed immense. The near-complete cessation of normal industrial, commercial and social activities across the world during lockdown has brought about large-scale unemployment, massive disruption of markets, and drastic changes in lifestyles and consumer behaviour that have had and will continue to have a cascading effect on all sections of the economy. Worldwide recession is predicted; the demand for goods and services is expected to remain depressed, with the battle against Covid-19 still raging and social distancing norms and other containment measures likely to remain mandatory for the foreseeable future. All in all, there is great uncertainty over whether, or when and how, economies across the world will recover; and hence, whether, when and to what extent the market demands for MSME products will return and stabilize.

Indian MSMEs underpin all other sectors of the economy. Their products form essential inputs for major industrial sectors in the country and abroad such as automobiles, chemicals, dairy, engineering goods, food processing, and textiles; they also contribute nearly 50% to India's exports¹. The financial health and future prospects of MSMEs are therefore inextricably tied with the ability of other sectors of the economy—industries, agriculture, commercial enterprises, construction, transport, household—to recover from the effects of lockdown and resume and stabilize their own functioning.

The lockdown has also disrupted the existing business relationships between MSMEs and other entities throughout the MSME supply chain— with raw material suppliers as well as buyers of finished products; with equipment and services vendors; with logistics providers, sales and marketing agencies, and other key entities in the complex multi-stakeholder environment in which MSMEs operate. These relationships, built painstakingly over years and decades, will now have to be established afresh by MSME entrepreneurs.

Enterprise planning and management will have been thrown into chaos as well: orders already committed to may have been cancelled by customers, who themselves are likely to be struggling with similar issues faced by MSMEs. Again, orders that had been executed and were awaiting shipment, or in process when the pandemic and lockdown hit the country, will now have to be assessed afresh or even re-negotiated before completion; because the required raw materials, technical support services and logistics may no longer be available from the conventional sources—or if available, are likely to entail higher costs and more time for execution, thereby affecting profit margins.

¹ Office of the Development Commissioner, MSME: http://dcmsme.gov.in/policies/central/trade.htm?GXHC_gx_session_id_=6126172a1f9e8c806#:~:text=The%20MSME%20Sector%20today%20constitutes,35%25%20of%20the%20total%20exports.



Then there is the critical issue of the workforce. The MSME sector provides direct employment to about 110 million people. Due to the shutdown of their factories and enterprises, millions of MSME workers have left their workplaces and returned to their native villages and towns, often located hundreds or thousands of kilometres away. Restarting MSME units will require contacting and arranging for the return of these ‘migrant’ workers; or if that is not possible, hiring fresh workers and reskilling them—both formidable tasks that entail investments of money, effort and time, and are made all the more difficult by the mandatory social distancing norms and other regulations that still restrict and slow down the movement of people within and across state boundaries. Besides, compliance to social distancing norms will also require major re-planning and rescheduling of production processes, including restructuring of the shop floors and re-deployment of workers.

In a nutshell, MSMEs gearing up to restart operations post-lockdown have to confront new challenges and risks, and find effective solutions simultaneously, in areas like:

- Re-establishing business relationships
- Fresh planning and scheduling of production, based on analyses and understanding of the transformed markets on both input and output sides
- Fresh costing of processes and products to take into account the new conditions
- Rehiring/reskilling workforce
- Reorganizing production schedules and production lines to comply with social distancing norms that are likely to prevail for some time

Path to recovery

The government is aware of the formidable challenges that the already cash-strapped MSMEs confront as they gear up to resume operations post-lockdown. From May onward, the Union has announced a slew of measures aimed at easing the liquidity situation of cash-strapped MSMEs and spurring their growth and productivity, as part

of its larger Atmanirbhar Bharat Abhiyan (ANBA)² stimulus package for the Indian economy (see BOX). There are encouraging reports³ that MSMEs have resumed operations in some parts of the country. Also heartening are the reports that MSMEs have started to avail of the financial stimulus packages announced by the government.⁴

Table 1. Existing and revised definitions of MSMEs

Existing MSME Classification			
Criteria: Investment in Plant & Machinery or Equipment			
Classification	Micro	Small	Medium
Manufacturing enterprises	Investment < Rs 25 lakhs	Investment < 5 crores	Investment < 10 crores
Service enterprises	Investment < 10 lakhs	Investment < 2 crores	Investment < 5 crores
Revised MSME Classification [applicable w.e.f 1st July 2020]			
Composite Criteria: Investment in Plant and Machinery or Equipment, and Annual Turnover			
Classification	Micro	Small	Medium ⁵
Manufacturing enterprises and enterprises rendering services	Investment < Rs 1 crore and	Investment < Rs 10 crores and	Investment < Rs 50 crores And
	Turnover < Rs 5 crores	Turnover < Rs 50 crores	Turnover < Rs 250 crores

Source: Ministry of MSME: (1) <https://msme.gov.in/whatsnew/atmanirbhar-presentation-part-1-business-including-msmes-13-5-2020>; (2) <https://msme.gov.in/know-about-msme>

Given the challenges that MSMEs face and the great uncertainties that cloud the future, only time will tell how effective the measures under ANBA will be in rejuvenating the MSME sector. However,

² Ministry of MSME; <https://msme.gov.in/whatsnew/atmanirbhar-presentation-part-1-business-including-msmes-13-5-2020>

³ For instance, see (1) <https://www.financialexpress.com/industry/unlockdown-1-80-industrial-units-in-gujarat-resume-operations/1979131/>; (2) <https://www.outlookindia.com/newscroll/all-nine-mega-textile-plants-msme-units-resume-operations-in-bhilwara/1844893>; (3) <https://www.tribuneindia.com/news/punjab/punjab-cm-gives-go-ahead-to-tiny-cottage-industries-in-ludhiana-to-resume-operations-84772>;

⁴ For instance, see <https://www.financialexpress.com/industry/sme/msme-fin-pm-modis-rs-3-lakh-crore-msme-loan-scheme-sanctioned-this-much-amount-in-just-one-day/1978613/>

⁵ On 13th May the revised limits for medium enterprises in regard to investment and turnover were set at Rs 20 crores and Rs 100 crores respectively; these were further revised to Rs 50 crores and Rs 250 crores respectively vide Gazette Notification dated 1st June; see https://msme.gov.in/sites/default/files/MSME_gazette_of_india.pdf



Atmanirbhar Bharat Abhiyan and revival of MSMEs

On 13th May 2020 the Prime Minister announced a Rs 20-lakh crore Atmanirbhar Bharat Abhiyan (ANBA) stimulus package to help revive the Indian economy following the lockdown. The ANBA package includes a number of measures specifically aimed at helping MSMEs revive and resume operations. Key measures include:

- **Revised definition of MSMEs.** As a priority sector of the economy for lending, MSMEs are eligible for benefits such as easier access to loans from banks and NBFCs, much lower interest rates on loans, tax rebates, and so on. The existing definition of MSMEs sets a comparatively low threshold level for investment in plant & machinery. This low limit has acted as a disincentive for MSMEs to grow in size and turnover (as growing beyond the threshold level would mean losing their benefits). Hence, the new definition of MSMEs has raised the limits for investment as well as for turnover substantially; also, the distinction between manufacturing and services has been abolished (table 1). This measure will help bring more enterprises under the MSME umbrella and incentivize them to grow.
- **Emergency credit line to businesses/MSMEs.** Post-lockdown, businesses and MSMEs need additional funds to meet their built-up operational liabilities, buy raw materials and restart work. An emergency line of credit worth Rs 3 lakh crores has been provided for the purpose, under which businesses and MSMEs can raise up to 20% of their entire outstanding credit as on 29th February 2020 from banks/NBFCs without collateral. The lenders will be provided 100% credit guarantee for these loans covering both principal and interest. The loans will have a tenure of 4 years with a cap on interest rate; MSMEs can avail of such loans till 31st October 2020, and a moratorium of 12 months is allowed on repayment of principal. An estimated 45 lakh MSMEs are expected to benefit from this measure.
- **Subordinate debt fund.** A subordinate debt fund has been set up in order to provide working capital to the extent of Rs 20,000 crores to stressed MSMEs. To facilitate this, the government has provided support of Rs 4000 crores to the Credit Guarantee Fund Trust for Micro and Small Enterprises (CGTMSE), which in turn will provide partial guarantee of the working capital loans extended by banks. About 2 lakh MSMEs are expected to benefit from this measure.
- **Fund of Funds.** A 'Fund of Funds' with a corpus of Rs 10,000 crores has been set up to provide equity funding for MSMEs with growth potential and viability. These equity infusions will enable MSMEs to grow in size and capacity, and in due course encourage the MSMEs to list on stock exchanges.
- **Global tenders disallowed up to Rs 200 crores.** In bidding for global government procurement tenders, MSMEs have found it hard to compete with overseas companies. Now, global tenders have been disallowed for government procurement tenders up to Rs 200 crores.



one thing is certain. Even as MSMEs prepare to restart operations, they must find and adopt ways to slash their production costs and increase their profitability.

And this is where the lockdown has brought opportunity for MSMEs, even in the midst of crisis.

Because in forcing MSMEs to halt production, the lockdown has also removed a major barrier that usually deters MSMEs from adopting improved technologies and practices—namely, their reluctance to halt or interrupt production for even an instant!

Opportunity: adopt best operating practices

Now, as MSMEs prepare to restart operations after the extended shutdown, the time is ripe for them to adopt energy-efficient technologies and practices that will save energy costs and thereby reduce production costs and increase profits. As highlighted in many earlier issues of this newsletter⁶, best operating practices (BOPs) yield significant savings in energy consumption and energy costs at low or even zero investments, and can be implemented

⁶ For instance, see SAMEEEKSHA June 2018; September 2018; June 2019

In forcing MSMEs to halt production, the lockdown has also removed a major barrier that usually deters MSMEs from adopting improved technologies and practices—namely, their reluctance to halt or interrupt production for even an instant!

quickly and easily—perhaps with some hands-on training of operators if and where required. Hence, BOPs can bring the MSMEs significant increases in profits—particularly when most MSMEs operate on very thin profit margins.

In adopting BOPs now, MSMEs can also avail of the special stimulus packages/schemes that have been launched by the government through ANBA to help MSMEs with working capital and other financial requirements in the post-lockdown period—and other schemes such as the collateral-free loans under SIDBI's 'Covid Startup Assistance Scheme (CSAS)'.

The article that follows highlights a few BOPs that can be adopted by MSMEs.



MSME'S CAN SLASH ENERGY BILLS, INCREASE PROFITS AT LOW OR ZERO COST

There are many measures—essentially, good housekeeping and best operating practices (BOP), including low-cost retrofits—that MSMEs can adopt to achieve significant energy savings and increase in profits at low or even zero investment. Table 1 shows some typical BOPs for common utilities in MSME units.

Case studies on BOP

Compressed air system

Unit: MSME in Rajkot

1. Arresting air leakages in compressed air distribution system

The unit was using three screw type air compressors. Studies revealed very high levels of leakage (38%) in the existing compressed air piping system. The unit therefore commenced periodical checking of the air piping system to detect and arrest leaks, and brought down the leakage levels to about 5%. At virtually no cost, this measure is saving about 61,619 kWh of electricity annually.

Investment: Nil

Annual savings in energy cost: Rs 4.16 lakhs

Simple payback period: Immediate

2. Optimization of compressed air generation pressure

The studies also revealed that the operating pressures of the three air compressors were set at higher

levels for 'unload' (7 bar and above) than the 6.5 bar pressure required in the various processes. The unit has therefore reset the operating pressure levels in the compressors to 6.5 bar. This no-cost measure is saving about 15,096 kWh of electricity annually.

Investment: Nil

Annual savings in energy cost: Rs 1.0 lakh

Simple payback period: Immediate

3. Installation of sequence controller for air compressors

Energy was being wasted in keeping all the three air compressors switched on, even when the plant's demands for compressed air fell to lower levels. The unit has therefore installed a sequence controller that switches the air compressors on or off based on the air demand in the plant. This measure is saving about 21,378 kWh of electricity annually.

Investment: Rs 2 lakhs

Annual savings in energy cost: Rs 1.4 lakhs

Simple payback period: 1.4 years

Furnace system

Unit: MSME in Pune

Optimizing combustion air supply in an NG-fired forging furnace

The unit was operating a number of NG-fired forging furnaces, of which one was found to have an efficiency of only 7%. Investigations showed that the existing low-capacity blower was not providing



(L) Air compressor system; (R) with sequence controller



Optimizing combustion air supply with new efficient blower: (L) existing blower (R) new blower



Table 1. Selected best operating practices for common utilities in MSMEs

Process area	BOP
Compressed air systems	Optimize air generation pressure settings to meet process requirements.
	Check for leakages through joints, valves and bends. Conduct leakage test on a regular basis to achieve energy saving.
	Ensure intake air temperature is close to ambient temperature.
	Clean the air filters periodically to ensure clean air intake.
	Keep compressor room clean, dust-free and cool. Isolate compressors from other heat-producing equipment.
	Avoid unnecessary bends and turns in distribution network to minimize pressure losses.
Fans & Blowers	Avoid blockage or restrictions at inlet or suction of the fan or blower to ensure full bore supply.
	Avoid throttling both in suction and delivery sides.
	Undertake scheduled overhauling of fans and blowers.
	Ensure dynamic balancing of fans/ blowers assembly after each overhauling.
	Operate fans and blowers close to best operating point of the characteristic curve as provided by the manufacturer.
Furnaces (melting, forging, heat treatment, etc.)	Optimize furnace charging practices.
	Set and control furnace temperature as per product requirements.
	Repair damaged refractory lining to reduce heat loss.
	Optimize combustion air supply to burner.
Lighting	Replace low efficiency lamps with energy efficient lamps like LEDs and induction lamps.
	Use electronic ballasts. Avoid using conventional chokes.
	For area lighting, use LED lighting in place of mercury vapour lamps.
	Clean windowpanes once in three months to ensure maximum utilization of daylight.
Motor-driven systems and applications	Operate motors in the range of 75–80% load to achieve maximum efficiency. Avoid under-loading of the motors.
	Use cogged v-belts instead of flat v-belts for belt-driven motor applications. Ensure proper tension of belts to minimize transmission losses.
	Use direct online (DOL) starters for motors up to 5 hp; star-delta type starters for 5–20 hp motors; and soft starter for motors with more than 20 hp capacity.
	Replace under-loaded and/or multiple-rewound motors with energy efficient IE3 motors of optimum capacity.
Transformer/ Main Incomer	Maintain unity power factor at transformer level to reduce the load losses, and also to avoid penalty for low power factor.

optimal combustion air supply to the furnace burner, resulting in formation of carbon monoxide which reduced combustion efficiency. The unit therefore replaced the existing blower with a new, efficient blower of adequate capacity.

Investment: Rs 0.4 lakhs

Annual savings in energy cost: Rs 4.9 lakhs

Simple payback period: Less than one month

More examples of BOP in various process areas

Table 2 shows a few more examples of low or no-cost BOP measures implemented by MSMEs in various process areas, and their benefits in terms of savings in energy costs.

Table 2. More examples of BOP in various process areas

Process area	BOP summary	Investment (Rs)	Savings in energy costs (Rs/year)	Simple payback period
Compressed air system	Optimization of compressed air generation pressure with modification of air piping	Marginal	0.32 lakhs	Immediate
	Arresting leakages in the compressed air distribution system, using crimped hose joints	Nil	0.66 lakhs	Immediate
Furnace system	Improved charging practices in induction melting furnace to reduce energy losses	Nil	2.2 lakhs	Immediate
	Application of veneering module in LPG-fired normalizing furnace	2.5 lakhs	10.6 lakhs	Less than 3 months
	Ceramic fibre insulation to reduce heat loss in forging furnace	1.8 lakhs	4.9 lakhs	Less than 3 months
	Installation of Dura line furnace lids in two induction furnaces	0.7 lakhs	3.0 lakhs	Less than 3 months
Motor-driven systems	Installing variable frequency drive (VFD) for refrigeration compressor motor	1.8 lakhs	24.0 lakhs	Less than one month
Transformer/Main Incomer	Improving power factor by installing capacitor bank and maximum demand controller	0.3 lakh	1.5 lakhs	Three months

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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