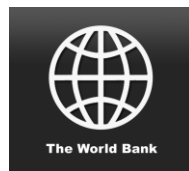


2012

Kolhapur Foundry Sector



Report on Capacity Building Needs
Assessment & Sector Breakup Study
26/Feb/12



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List of Abbreviations

Abbreviations	Full Form
BEE	Bureau of Energy Efficiency
CBC	Cold Blast Cupola
DBC	Divided Blast Cupola
EC	Energy Conservation
EE	Energy Efficiency
GOSHIMA	Gokul Shirgaon Manufacturers Association
IA	Industrial Associations
IF	Induction Furnace
KEA	Kolhapur Engineering Association
MAKH	Manufacturers Association of Kagal – Hatkanangale
SEC	Specific Energy Consumption
SIDBI	Small Industries Development Bank of India
SMAK	Shiroli Manufacturers Association, Kagal



Acknowledgment

We SEE-Tech Solutions Pvt. Ltd. express our sincere gratitude to SIDBI and World Bank for giving the opportunity to carry out the study for Capacity Building Needs Assessment and Sector Breakup for Kolhapur Foundry Sector. We thankfully acknowledge the support and guidance provided by all concerned officials during the conduct of this exercise.

Small Industries Development Bank of India

- Mr. Rajiv Kumar (DGM, Energy Efficiency Centre, SIDBI, New Delhi)
- Mr. Umang Mistry (AGM, SIDBI, Kolhapur)

We are also thankful to Industrial Associations and Foundry Units. The study would not have been completed without their interaction and timely support. We are grateful for their co-operation during field study and provision of data for the study.

For SEE-Tech Solutions Pvt. Ltd.

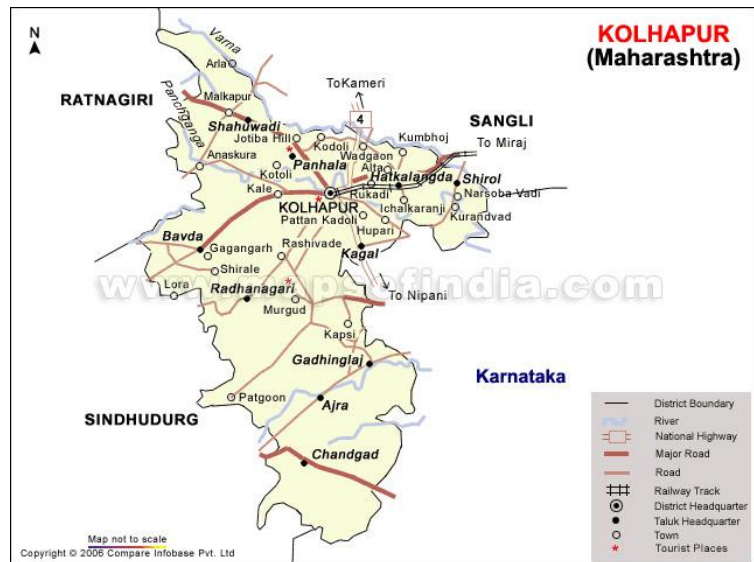


1. Sector Background

1.1 Kolhapur

Kolhapur is a city situated in the southwest corner of Maharashtra, India. The population of Kolhapur city was 5,49,283, as per the 2011 census. Kolhapur also serves as the headquarters of the Kolhapur district. As is the case in most of the Maharashtra cities, the main language spoken in Kolhapur is Marathi. Kolhapur is situated on the banks of the river Panchganga and is the location of the Temple of Mahalakshmi, a Hindu goddess.

Kolhapur's climate is a blend of coastal and inland climate of Maharashtra. The temperature has a relatively narrow range between 10°C to 35°C. Summer in Kolhapur is comparatively cooler, but much more humid, compared to neighbouring inland cities. Maximum temperatures rarely exceed 38°C and typically range between 33 to 35°C. Lows during this season are around 24°C to 26°C. The city receives abundant rainfall from June to September due to its proximity to the Western Ghats. The heavy rains often lead to severe flooding in these months. Temperatures are low in the rainy season and range between 19°C to 30°C. Kolhapur experiences winter from November to February. The winter temperatures are a bit higher compared to other cities in Maharashtra such as Pune and Nasik. Lows range from 9°C to 16°C while highs are in the range of 26°C to 32°C due to its high elevation and being adjacent to the Western Ghats. Humidity is low in this season making weather much more pleasant. In 2005 & 2006 there was excessive rainfall in Kolhapur resulting in floods.



1.2 Connectivity to Kolhapur

Kolhapur city is located in south-western Maharashtra. It has an elevation of 569 metres (1867 ft) which is higher than that of Pune. By road, Kolhapur is 228 km south of Pune, 615 km north-west of Bangalore and 530 km west of Hyderabad.[6] The nearest cities and towns within Maharashtra are Ichalkaranji (20 km), Kagal (17 km), Sangli (50 km), and Miraj (45 km).

Railway

Kolhapur railway station known as Chattrapati Shahu Maharaj Terminus is connected to major Indian cities. Mumbai, Pune, Hyderabad, Bangalore, Solapur, Nagpur, Tirupati, Ahmedabad, Delhi, Dhanbad are directly connected from Kolhapur through express trains. There are daily passenger shuttle services between Kolhapur to Miraj.

Road

Kolhapur is connected to Mumbai to the north and Bangalore to the south by National Highway 4 which is further extended to Chennai. It is one of the primary destinations on this highway. Kolhapur has state transport bus stands namely Central Bus Stand (CBS), Rankala & Sambhajinagar. Kolhapur Municipal Transport buses cover almost all routes inside the city. The National highway connectivity also ensures a large number of private bus service offerings. Volvo and Mercedes bus are used to connect Mumbai, Bangalore Pune, Goa and Hyderabad by operators like Kirloskar, Ghatge Patil, Nakoda and others

Air

The city has an airport near Ujlaiwadi.

1.3 Industrial Development & Foundry Sector

The economy of Kolhapur is highly dependent on agriculture. Location on the Deccan Plateau, the rich black soil and the availability of water make Kolhapur highly suitable for agricultural activities. Agriculture is the main contributor to the economy of Kolhapur. Its sugarcane industry contributes to over 5% of the sugarcane produced in the country and accounts for a significant share of sugar, jaggery and baggase produced. The city is also an important trading centre for agro-products like jaggery, sugar, pulses, chillies, turmeric, and food grains.

1.3.1 Kolhapur's Cooperative Movement

Kolhapur is one of the districts leading the cooperative movement in Maharashtra. This movement has brought about revolutionary developments in various fields of the district. There are about 11338 co-operative societies in the district with 35.13 lakh members. The total share capital of these societies is ₹ 504.26 crores¹.

Among various co-operative societies, the cooperative sugar factories, co-operative milk societies, co-operative banks, co-operative marketing societies, and the co-operative spinning mills are playing a major role in the prosperity of the co-operative movement in the Kolhapur district. There are 17 co-operativesugar factories in the Kolhapur district with 2.84 lakh members. These sugar factories have a total crushing capacity of 62.15 lakh metric tonnes and produce 7.56 lakh metric tonnes of sugar.

The Kolhapur district is a leading district in dairy farming; it boasts of milk production with huge exports of milk and milk products. The setting up of the dairies, Gokul, Warana and Mayur, is a landmark in the economic development of the district; the Gokul Milk Co-operative is one of the biggest dairies in India. Warana is a classic example and excellent manifestation of rural creativity.

1.3.2 Industrial Activities

The Kolhapur industry mainly comprises sugar industries, textile mills, engineering units and foundry units. The industry lacks entrepreneurial capacity. This reflects a need for private initiation and a new entrepreneurial vision.

¹ Source: Economic & Social Abstract 2003-04 (Published by State Government of Maharashtra)



Large and Medium-Scale Industries

As in March 2001, the Central Government has granted permission for 277 medium and major industries in Kolhapur. Of these, 110 units have started production. The major units are 21 spinning mills (private and co-operative), 15 sugar industries and 21 textile mills. The remaining 53 units are based on engineering goods, poultry, foundry, chemicals, animal foods, etc. The 110 units represent an investment of Rs. 563 crores and generate employment for 55,000 people.

Small-Scale Industries

As in March, 2001 Kolhapur district had 18,698 industries, generating an employment of around one lakh. The major small-scale units manufacture auto spare parts, casting, engineering job work, diesel engines and engine parts, textile and silver ornament and chappals. During the period, 1950s to 1980s, the foundry in Kolhapur developed due to incoming business from automobile industries in Pune. However, now industries in Pune are opting for backward integration. As a result, this business has diminished, limiting the growth of the foundry industry.

1.3.3 Industrial Areas

Kolhapur has three main industrial corporations (MIDC) outside the city namely Shirol, Gokul Shirgaon and five star MIDC at Kagal. There is also an old industrial estate known as Udyamnagar within the city.

The *Shirol Industrial Estate* covers 260 hectares. Of the total 730 plots in this estate, around 650 plots have been sold. 635 industries are currently functioning in this area. MIDC has spent about ₹ 6 crores on providing basic infrastructure in this area. The major industries in this estate are Menon Casting, Manograph Industries, Lokmat, Kolhapur Steel, Saroj Iron Industry, Sriram Foundry, Mahalaxmi Masala Products, Bharat Udyog Ltd. and H.J.Iron.

The *Gokul Shirgaon Industrial Estate* is spread over 220 hectares. It has 850 plots of which 800 are sold. 750 industries function in this estate, most of them relating to engineering and foundry. The major industries are Gokul, Eurotex, Menon Bearings and Indocount.

The *Kagal 5 Star Industrial Estate* comprising 3000 plots, spread over 1100 hectares has been established near Kolhapur. Industries located in around 300 to 400 plots are functioning currently.

In addition to this there are around seven cooperative industrial estates in which about 2,140 plots have been issued, of which 1,272 are functional; 44,850 workers are engaged in these estates.

The Kolhapur industry is a source for OEMs (Original Equipment Manufacturers) outside India. It is emerging as an engineering component exporter.

1.3.4 Foundry Sector

Kolhapur is not only famous as a tourist place but also it is one of the most important places for foundry businesses. The foundry businesses of Kolhapur are spread in Echalkaranji, Sangli and Belgaon also. Most of the foundries are in the sand casting. Castings

manufactured in Kolhapur are recognized globally for their accuracy and finish. Foundry units in Kolhapur are the major suppliers to the OEM customers like Tata, Bajaj, Mahindra and Mahindra, General Motors, etc.

Including Kolhapur and nearby industrial areas there are around 250 foundry units. These units may be further divided on the basis of furnace used. Figure shows the category wise number of foundry units.

Due to the increasing demand of quality products, manpower cost and pollution treats the foundry units have started using more and more induction furnaces. Around 46% i.e. 114 units have only induction furnace. 36% i.e. 90 units have only cupola furnace. 9% i.e. 23 units each have both cupola and induction furnace and 23 units have duplexing operations.

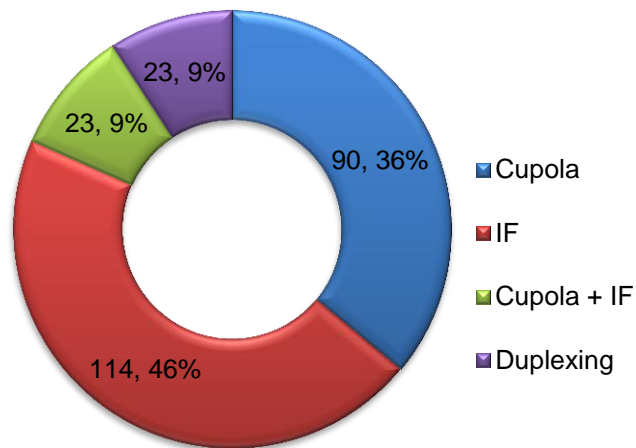


Figure 1: Foundry Categories

Most of the units produce cast iron castings. Some units also produce ductile iron castings. Cast iron castings producing units are more than 80%.

1.4 Total Production & Capacity wise Breakup

The foundry units in Kolhapur vary a lot in reference to their annual production. There are units producing 200 MT per annum and also plants producing 200 MT per day.

Foundry units in Udyam Nagar are small units producing 200 MT to 700 MT per annum. The foundry units in other industrial areas are of large production capacity.

Based on the annual production the foundry units can be categorized into 3 types as follows:

1. Small Units (annual production up to 1000 MT)
2. Medium Units (annual production 1001 MT to 10,000 MT)
3. Large Units (annual production more than 10,000 MT)

Following figure shows the percentage distribution of units in these categories.



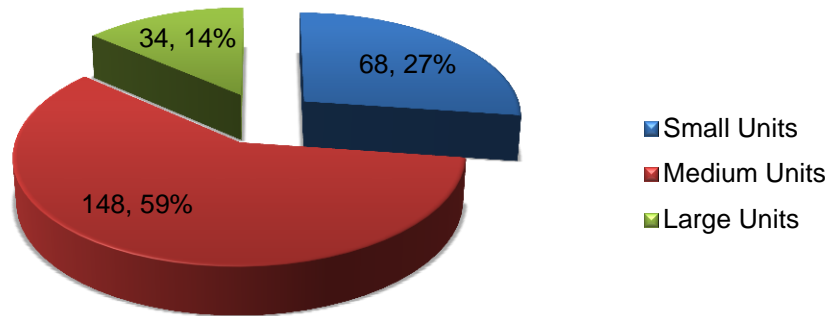


Figure 2: Production Capacity of Units

Around 59% units are of medium capacity, 27% are of small capacity and 14% are large capacity units.

1.5 Type of Products

The products taken in the Kolhapur Foundry sector can be broadly categorized into following types:

1. Automotive/Oil Engines
2. Pumps/Valves
3. Sugar Industry
4. Tractor Parts/Agricultural Implements

Due to the development of automobile industries in Pune and around most of the foundry units are producing automotive and oil engine parts. Some of the units are taking mix product also. Figure shows the units producing different products.

80% of the foundry units produce automotive and tractor parts, 45% produce automotive/oil engines and other 45% produce pumps/valves.

34% units produce other engineering products whereas 11 % units produce tractor parts/agricultural implements.

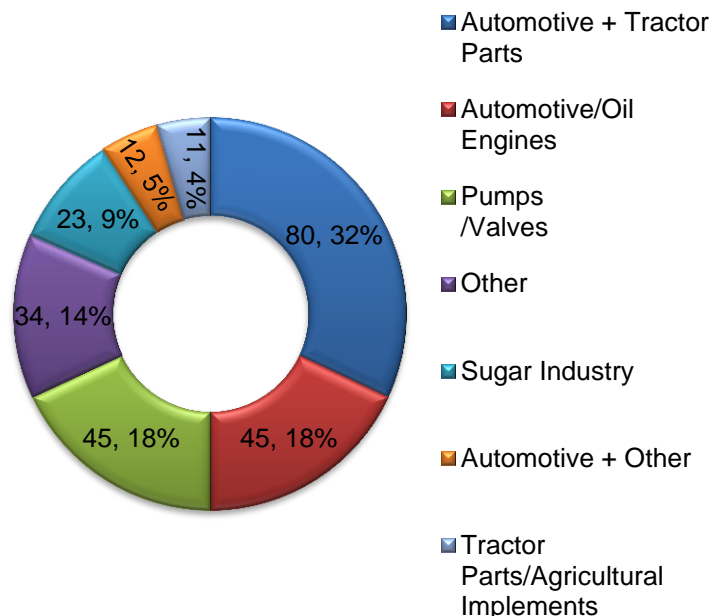


Figure 3: Types of Products



1.6 Employment

Foundry units have provided employment to lots of people. The workers working are mostly the localized of Kolhapur. Nowadays the foundry units are facing problems related to the workers. The working conditions of foundry industry are dark, hot, dusty and very laborious due to which the workers are turning towards other industries.

Foundry units are working continuously to improve the working conditions and looking for new ways to retain workers.

1.7 Industrial Associations & Other Agencies

As discussed earlier Kolhapur has three main industrial corporations (MIDC) outside the city namely Shirol, Gokul Shirgaon and five star MIDC at Kagal and also an old industrial estate known as Udyamnagar within the city. In addition to these there are some Cooperative Industrial Estates also. These industrial areas are having many industrial and engineering associations. Some of the important industrial associations and agencies are as follows:

Table 1: Industrial Associations & Other Agencies

Sr. No.	Name of Association	Location	Category
1.	Kolhapur Engineering Association (KEA)	Shivaji Udyamnagar, Kolhapur	Industrial Association
2.	Shirol Manufacturers Association	Shirol	Industrial Association
3.	Gokul Shirgaon Manufacturers Association	Gokul Shirgaon	Industrial Association
4.	Kolhapur Udyam Cooperative Society	Kolhapur	Industrial Association
5.	Manufacturers Association of Kagal – Hatkanangale	Kagal	Industrial Association
6.	Shri Laxmi Industrial Manufacturers Association	Hatkanangale	Industrial Association
7.	Sangli – Miraj MIDC Manufacturers Association	Miraj	Industrial Association
8.	Ichalkaranji Engineering Association	Ichalkaranji	Industrial Association
9.	Chhatrapati Shahu Cooperative Industrial Estate Ltd.	Shirol	Industrial Association
10.	Indian Institute of Foundrymen	Kolhapur	Other Agencies
11.	Kolhapur Chambers of Commerce & Industries	Kolhapur	Other Agencies

KEA is the apex industrial association whereas IIF is the well-known technical association for foundry industry.



1.8 Ongoing Projects/Activities for EE & Improvement

1.8.1 BEE's Energy Efficiency Program

After BEE started energy efficiency programs in industrial clusters a lot of projects are going on all over the country. In Kolhapur foundry cluster also BEE's energy efficiency project is going on. BEE in coordination with a third party has carried out walkthrough energy audit in sample number foundry units involving an international consultant. The consultant will prepare DPR on the basis of which demo energy conservation projects will be installed in few units.

1.8.2 Kolhapur Foundry Cluster Program

Industrial associations in Kolhapur in coordination with the local politicians and state government are also trying to improve the status of the foundry cluster by developing infrastructure. Industrial associations are following up with the government from last seven years for a program called Foundry Cluster. The government has approved this program and has also sanctioned a grant of ₹ 42 crore. The total grant for the project is of ₹ 70 crores of which first phase of ₹ 42 crores have been approved. Under this project infrastructure like two sand reclamation plants, two CFC centers, street lights, effluent treatment plants (ETP), buildings, plant machinery, pollution testing lab, generator will be developed. Chief Minister of Maharashtra, Home Minister of Maharashtra, State Government, Central Government and money other association and units have extended their cooperation for this program.

Through this program funds will be raised for improving the quality of foundry products. There is a lot of demand in the domestic as well as international market for the products developed in Kolhapur foundries. As India is a developing Auto-hub the ancillary products in Kolhapur are also getting more demand. Therefore it is important to improve the quality of the products which is the main objective of this program.

The sand coming out from the foundry units is a big problem to the foundry owners due to the increasing pollution. This problem will get solved due to the sand reclamation plants which will be developed under this program. This program also has fund arrangement for improving the roads, sanitation and street lights in industrial areas.

1.9 Status of Service Providers

The service providers in the foundry sector are mostly local. There are lots of local service providers who provide services for repair and maintenance of the cupola furnace, sand preparation, molding solutions, shot blasting, testing etc. For supply, repair and maintenance of induction furnaces the leading induction furnace OEMs have their service centers at Kolhapur.

The local service providers are very active have their strong network in the sector. The units also trust the local service providers for their prompt services which help them to keep the production continuous.

There are also some service providers in the Kolhapur Foundry sector who have vast experience in cupola designing, operation and production. These experts provide their consultancy to the units as and when required.



List of service providers active in the Kolhapur foundry sector is attached in annexure 3.

1.10 Financial Institutions

The presence of financial institutions is very much important for the development and prosperity of any industry. In Kolhapur many nationalized, scheduled and cooperative banks and other financial institutes are present. As most of the old industrial areas are of cooperative type many foundry units (especially small) are having their financial bonding with the cooperative banks. Medium and large size units are now banking with nationalized and scheduled banks.

SIDBI is also having presence in the sector and is providing financial assistance to the units for their development.

The finance availed by the foundry units are mostly for renovation, up gradation and expansion. It is not particularly for energy efficiency and energy conservation. The penetration for energy efficiency and energy conservation technologies is less. Only banks like SIDBI and SBI are having special financial schemes for energy efficiency and energy conservation projects.

1.11 Knowledgeable Consultant Available in Sector

The foundry units have got knowledge about operation through their experience only. There is a lack of knowledgeable consultant available in the sector. Many of the units (including large) have not ever carried out energy audit through a third party. The knowledge about energy efficiency and energy conservation is very rare.

Very few professional consultants are available who provide consultancy services for energy efficiency and energy conservation.



2. Energy Consumption Scenario

2.1 Type of Energy

In foundry units for melting two types of furnaces are used. One is cupola which uses coke for melting and another is an electrical furnace. Therefore the types of energy sources used in Kolhapur foundry sector are coke and electricity.

2.2 Annual Energy Consumption & Bill

Cupola is most favorite furnace in foundry sector due to its simple operation and low cost. Earlier the numbers of cupola having units were more in Kolhapur however due to the increasing demand for quality product, manpower problem and pollution issue many units have shifted from cupola to induction furnace. Thus the numbers of units using induction furnace has increased now.

Following table shows the energy consumption and energy bill of Kolhapur foundry sector.

Table 2: Annual Energy Consumption & energy Bill

Category	Total No.	Annual Electricity Consumption (MU/annum)	Annual Electricity Bill (Crore ₹/annum)	Annual Coke Consumption (MT/annum)	Annual Coke Bill (Crore ₹/annum)
Cupola	90	4	3	13,801	44
IF	114	606	428	0	0
Cupola + IF	23	30	18	7,360	20
Duplexing	23	545	422	1,06,950	303
Total	250	1,185	870	1,28,111	367

Thus annual electricity consumption of Kolhapur foundry sector is about 1,185 MU with an electricity bill of about ₹ 870 crore. Annual coke consumption of Kolhapur foundry sector is about 1,28,111 MT with a bill of about ₹ 367 crores. Thus annually about ₹ 1,237 crore are spent as energy cost.

2.3 Specific Energy Consumption

The extent of energy efficiency in any units can be determining the specific energy consumption (SEC) of that unit. SEC of cupola furnace is expressed in kg of metal melted in per kg of coke whereas SEC of induction furnace is expressed as kWh consumed per MT of molten metal. Following table shows the SEC observed at Kolhapur foundry units.

Table 3: SEC of Furnaces

Furnace	SEC	Unit
Cold Blast Cupola	8.31	kg/kg
Divided Blast Cupola	9.83	kg/kg

Furnace	SEC	Unit
Induction Furnace	733.96	kWh/MT

2.4 Carbon Emissions

Extensive energy consumption in consumption in any sector results into increase in GHG emission which is thereby responsible for the greenhouse effect. GHG emission can be quantified in terms of CO₂ getting emitted due to the fossil fuel consumption and also due to electricity consumption. Following table shows the CO₂ emission taking place due to energy consumption in Kolhapur foundry sector.

Table 4: Carbon Emissions²

Sr. No.	Energy Consumption	CO ₂ emission (1000 tons of CO ₂ /annum)
1	1,185 MU/annum	948
2	1,28,111 MT Coke/annum	287
	Total	1,235

Thus the energy consumption in Kolhapur foundry sector is resulting into 1,234 thousand tons of CO₂ emission.

2.5 Benchmarks of Specific Energy Consumption

Experts have defined benchmarks of specific energy consumption for different energy intensive processes as well as energy intensive equipments of foundry.

Following table shows the benchmarks for SEC of different energy intensive equipments of foundry.

Table 5: Benchmarks of SEC

Sr. No.	Equipments	Benchmarks	Unit
1.	CBC	7 – 10	Kg of metal / kg of coke
2.	DBC	10 – 12	Kg of metal / kg of coke
3.	HBC	12 – 14	Kg of metal / kg of coke
4.	Main Frequency IF	700 – 750	kWh/MT of metal
5.	Medium Frequency IF	650 – 700	kWh/MT of metal
6.	Reciprocating Air Compressor	16 – 17	kWh/100 CFM

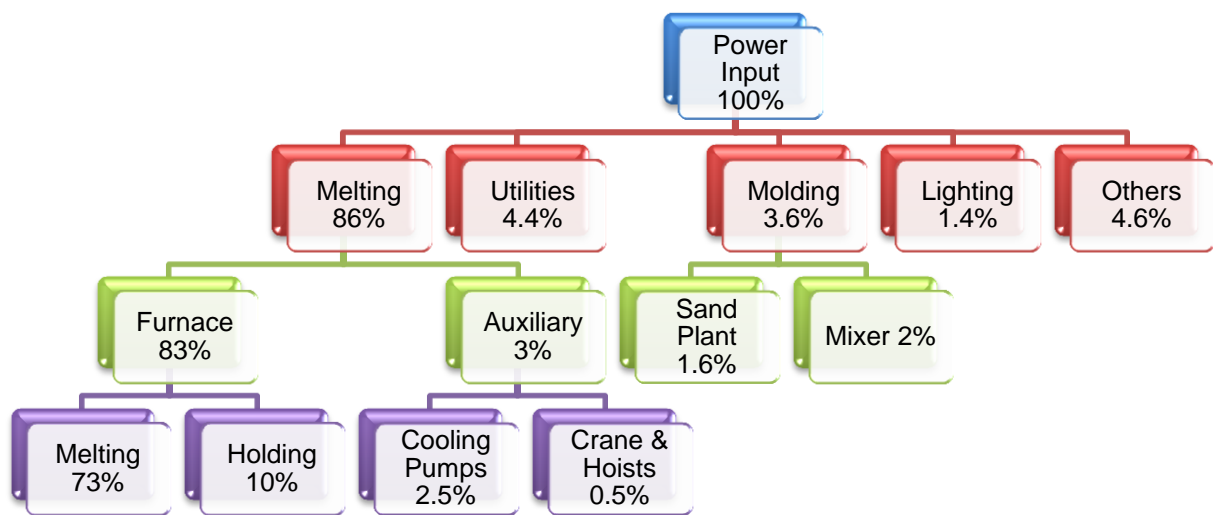
² 1 MWh = 0.8 tone of CO₂ emission and 1 Tera Joule of energy = 107 tone of CO₂ emission

Looking toward the SEC of cupola and induction furnace observed in Kolhapur foundry sector is higher in comparison to the benchmarks. This shows the saving potential available in Kolhapur foundry sector.

2.6 Energy Intensive Processes

The processes in foundry units can be broadly divided into three i.e. sand preparation, molding and melting. In these three processes also the melting is the most energy intensive process. Following figure shows the electrical energy balance of a typical foundry unit.

Figure 4: Electrical Energy Balance



Thus 90% of the electrical energy is getting consumed for melting only.

In case of plants using cupola furnace the coke consumption in cupola is much significant as compared to the electrical energy getting consumed in other processes.



3. Operating Practices

The manufacturing process of foundry industry is almost similar in all the units with the utilities and auxiliary equipment varying depending upon the requirement, the manufacturing process in foundry industry includes metal melting, sand preparation, pattern preparation, mold preparation and casting.

Melting Section:

The raw material is melted in the furnace. The melting furnace can be induction furnace or cupola. Molten metal from the melting furnace is tapped in ladles and then transferred to the area where molds are kept and is poured into it.

Sand Plant

Sand preparation is done in sand plant. Sand mixers are used for this purpose. Used sand and fresh sand are mixed together; some additives (adhesives) are added into it. This sand is then used for sand mold making.

Pattern Preparation

Patterns are the exact facsimile of the final product. Generally these master patterns are made of aluminium or wood. Using the pattern the sand molds are prepared.

Mold Preparation

In small scale industries molds are still handmade. Modern plants are using pneumatic or hydraulic operated automatic molding machines for the molds. After the molding process, if required the cores are placed at the appropriate positions in the molds. Then the molds are kept ready for pouring the molten metal.

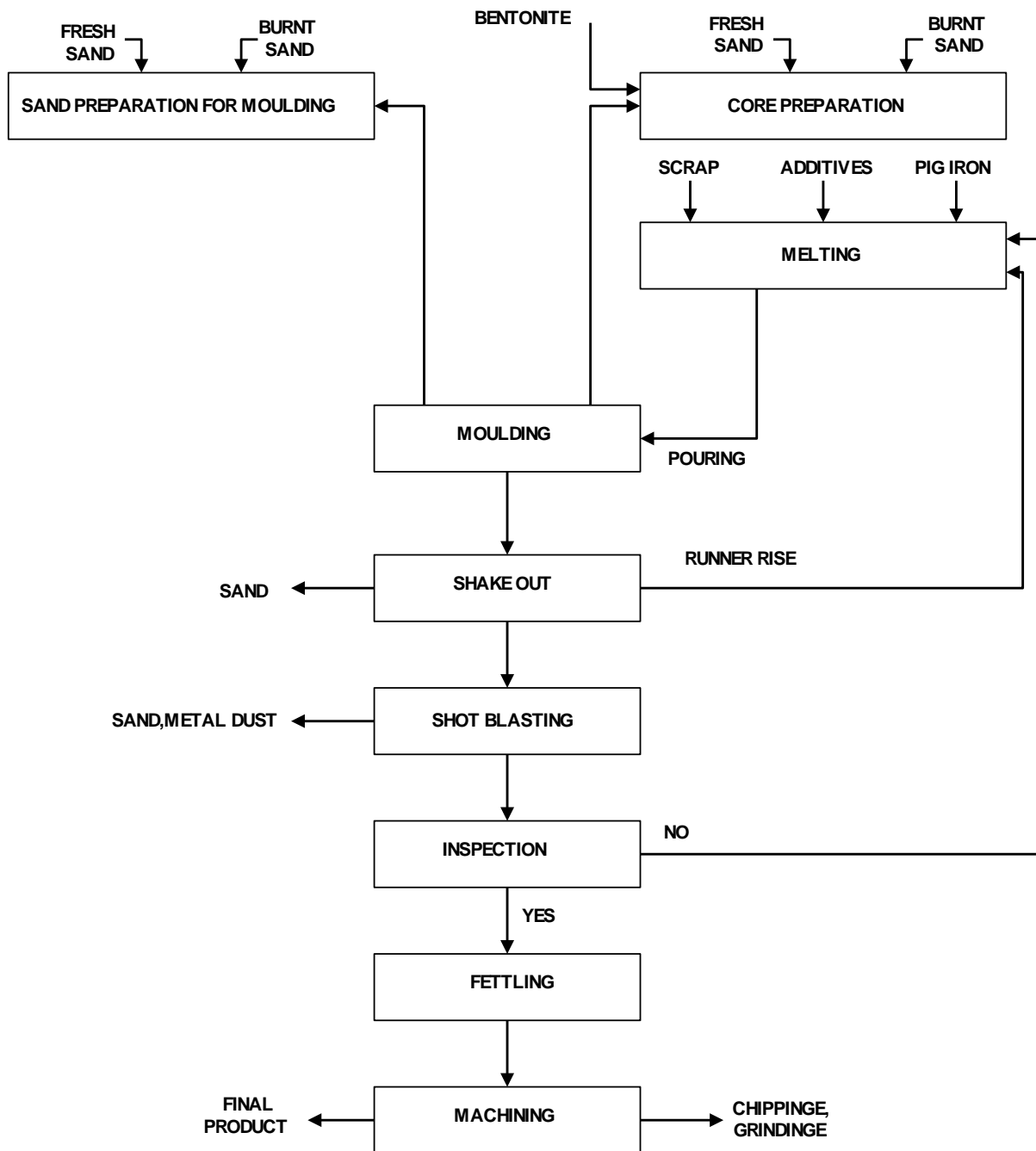
Casting

The molten metal tapped from the furnace is poured into molds. The molten metal is allowed to cool in the molds for the required time period and castings are produced. The molds are then broken and shaken out to remove sand and used sand is sent sand plant for reclamation and reuse. The casting produced are sent to fettling section for further operations such as shot blasting, heat treatment etc. depending upon the customer's requirements.

Following figure shows the process flow diagram of a typical foundry unit:



Figure 5: Process Flow Diagram of a Typical Foundry Unit



Based on the operating practices the foundry units at Kolhapur can be divided into three categories namely Cupola Melting, Induction Furnace Melting and Duplexing Melting.

3.1 Cupola Melting

In cupola melting metal is melted in cupola furnace. Rest of the process is same as described above.

3.2 Induction Furnace Melting

In furnace melting metal is melted in induction furnace. Rest of the process is same as described above.

3.3 Duplexing Melting

In duplexing metal is first heated (near to molten phase) and then melted in induction furnace. This process is named as duplexing. Duplexing is mainly done to reduce the electricity consumption of induction furnace.



4. Energy Efficiency – Status & Barriers

4.1 Status of Energy Efficiency

The foundry industry of Kolhapur is production oriented. Penetration of energy efficiency is very less. There are still many industries which are having cold blast cupola furnaces. Very few units have installed divided blast cupola. Many units have changed from cupola operation to induction furnace in order to increase the melt rate, improve material quality and production capacity. Induction furnaces are having the conventional controls and not the IGBT or new energy efficient controls.

In many units molding is done manually which increases the rejection rate of molds and increase the hold time. Many times there is no synchronization between the mold making and tapping time which results into heating loss. Pouring is also a manual process in many of the units which increases spillage and wastage.

Compressed air is used for cleaning. The compressors used are of reciprocating type.

4.2 Barriers to Energy Efficiency

The main reason for the lower penetration of energy efficiency in the Kolhapur foundry sector is lack of awareness. The foundry sector in Kolhapur is a very old cluster. Most of the units are the small units producing only 100 to 200 MT per month. The people running these units are lower in qualification and are not graduate professionals. The operation of the unit is overrun by the production targets. Different barriers of energy efficiency are listed below:

1. Less awareness
2. Lack of qualified manpower
3. Production targets oriented operations
4. Lack of knowledgeable consultants
5. Lack of EE service providers
6. Lack of EE equipments suppliers, vendors

In case of the medium and large units and new units coming in the situations is slightly changing. They adopting energy efficiency technologies in order to take more production in less fuel consumption and thereby reducing the production cost. But the numbers of such units are very less.



5. Capacity Building Needs

On interaction with the foundry units it has been assessed that the awareness about energy efficiency is very less. None of the unit has ever carried out energy audit through energy auditing firms; none of the unit (except very few large units) have designated or appointed energy manager and none of the unit has a defined Energy Policy.

There is a strong need of capacity building of the units. It is needed to educate the units about energy efficiency and its advantages. "Seeing Is Believing" is the tendency of MSME units. They don't dare to change unless and until they are pretty sure about the results and have seen the results in of the similar unit. Therefore a holistic approach is needed to increase the energy efficiency among these units.

For capacity building of the foundry units following activities need to carry out in the sector.

1. Energy audit at selected units
2. Implementation of demo projects and replication in other units
3. Training programs and workshops to increase the awareness about EE
4. Capacity building of EE service and equipments providers
5. Preparation of database of EE consultants available in the sector
6. Preparation of database of EE service and equipment providers
7. Introducing the financial institutions and their EE finance scheme to the foundry units
8. Empowering IAs to guide the foundry units for promoting EE

Implementation of demo projects will help show case them the results and benefits. It will also help to create the replication of energy conservation measures in other units. Workshops and training programs will help to increase the awareness.



6. Financing Schemes of SIDBI and Its Beneficiaries

Small Industries Development Bank of India (SIDBI) was established on April 2, 1990 under an act of Indian Parliament. It is the principal financial institution for the promotion, financing and development of MSMEs. Over the years, SIDBI has evolved itself as a one-stop institution to meet the various types of credit requirements of the MSME sector by offering specialized fund based and non-fund based financial products. In keeping with the spirit of innovation and entrepreneurship, the Bank has also evolved its bouquet of offerings over the years. One such growing area is the financing energy efficient, green technologies which also offer a tremendous opportunity for the banking sector.

SIDBI is committed to promote sustainability in the MSME sector by recognizing the fact that sustainable development is a key to MSME sector's survival and growth in future. In order to improve productivity and competitiveness of MSME sector through energy efficiency (EE) measures in the production process, the Bank up-scaled its EE financing by contracting bilateral Lines of Credit (LOC) from Japan International Cooperation Agency (JICA), KfW and AFD. The Bank availed a World Bank LOC to promote clean technologies, environmental safety and social standards in the MSME sector.

The various lending/financing schemes of SIDBI for the promoting EE as follows:

6.1 SIDBI Financing Scheme for Energy Saving Projects in MSME Sector under JICA Line of Credit

The Japan International Cooperation Agency (JICA) has extended a line of credit to SIDBI for financing Energy Saving projects in Micro, Small and Medium Enterprises (MSMEs). This project is expected to encourage MSME units to undertake energy saving investments in plant and machinery to reduce energy consumption, enhance energy efficiency, reduce CO₂ emissions, and improve the profitability of units in the long run.

Eligible Sub Projects / Energy Saving Equipment List under JICA Line of Credit:

- Acquisition (including lease and rental) of energy saving equipments, including installing, remodeling and upgrading of those existing.
- Replacement of obsolete equipments and/or introduction of additional equipments which would improve performance.
- Equipments / Machinery that meet energy performance standards /Acts.
- Introduction of equipments that utilize alternative energy sources such as natural gas, renewable energy etc., instead of fossil fuels such as oil and coal etc.
- Clean Development Mechanism (CDM) projects at cluster level that involve change in process and technologies as a whole, duly supported by technical consultancy, will be eligible for coverage.

Eligibility criteria for units (Direct assistance)

- Existing units should have satisfactory track record of past performance and sound financial position.



- Projects will be screened as per Energy Saving List, which is available on the SIDBI website.
- Units should have minimum investment grade rating of SIDBI.
- Projects which may result in negative environmental and social impacts are also not eligible under this scheme.

Financial Parameters

The financial parameters for appraising the project are:

Table 6: The Financial Parameters for Appraising the Project under JICA Scheme

Parameter	Norms
Minimum assistance	₹ 10 lakh
Minimum promoters contribution	25% for existing units; 33% for new units
Interest rate	The project expenditure eligible for coverage under the Line will carry the following rate of interest: <ul style="list-style-type: none"> • Fixed rate: 9.5 to 10% per annum based on rating • Floating rate: 9.75 to 10.5% per annum based on rating
Upfront fee	Non-refundable upfront fee of 1% of sanctioned loan plus applicable service tax
Repayment period	Need based. Normally the repayment period does not extend beyond seven years. However, a longer repayment period of more than seven years can be considered under the line, if necessary.

6.2 SIDBI's Technology Up-gradation Programs

Introduction

The competitiveness of the products of SSI units both in the domestic and international markets is dependent to a large extent on their productivity levels, price factors and quality characteristics. SIDBI's technology up-gradation and modernization program is aimed at improving the technical capabilities and competitiveness of SSI units in clusters by introducing commercial proven technologies which will result in significant improvement in quality, productivity, bring about cost reduction, saving of energy and raw materials and reduction in the level of pollution.

Objective

SIDBI's efforts broadly aim at:

- Creation of awareness on new product / process technologies
- Skill up-gradation
- Development of technology related common facilities for the cluster
- Provision of unit-specific modernization package
- Energy conservation and introduction of environment friendly technologies
- Quality up-gradation in terms of systems and products



Approach

The first step involves the selection of clusters, which have certain homogeneity in terms of status of technology, products, production levels, trade practices, and capacity to absorb improved technology. Individual clusters are then assigned to expert consultancy agencies that assess the technology up-gradation needs and prepare unit-specific modernization packages including scope for consolidation of technical capabilities of existing units.

The implementing agencies are suitably compensated by way of professional fee for undertaking the assignment.

Progress

TUP has been launched by the Bank in more than 25 clusters. The clusters identified for intervention range from Sea Food Processing Industry (Coastal Kerala) to Brass and Bell Metal Industry (Hajo in Assam) and from scientific instrument industry (Ambala, Haryana) to artisan based Blacksmithy units at Myllem, Meghalaya.

In addition to this, the Bank is to implement the National Program for Rural Industrialization in 25 clusters of which 12 initiatives are already underway.

Impact Assessment studies in select clusters reveals that:

- Earning of artisans has gone up from ₹ 30 to ₹ 75 in the Brass and Bell metal industry of Hajo, Assam.
- Fuel saving of ₹ 20,000 per month per unit achieved by the Foundry units of Howrah, West Bengal.
- Annual savings of ₹ 23 lakh achieved by the units manufacturing Bicycle and Bicycle parts in Ludhiana.
- Program has been found to be cost effective. In the Bicycle cluster at Ludhiana, total grant assistance extended by SIDBI was to the extent of ₹ 20.70 Lakh and saving of ₹ 150 lakh per annum were achieved by the units. Likewise, in the foundry cluster at Howrah, with grant support of only ₹ 2.90 Lakh, saving of ₹ 96 lakh per annum have been achieved.

6.3 AFD – SIDBI Energy Efficiency Line of Credit

Objective

The overall objective of the program is to reduce the fossil fuel energy consumption of the MSME sector and to reinforce its resilience to a new energy context, characterized by increasing energy prices and higher constraints on CO₂ emissions.

The project aims to promote energy saving investment within MSME units to reduce their energy bill, to improve their energy efficiency and to enhance their competitiveness. This will allow such units to reduce their CO₂ emissions and play an active role in climate change mitigations in line with the objective of the National Action Plan on Climate Change in India.

The project will combine a cluster approach especially in the energy intensive sectors such as foundry, textile, leather, ceramics food processing etc. and a technology approach based on energy efficient equipments for plant and machinery.



Eligibility Criteria

Eligibility criteria regarding client beneficiaries

- MSME units, as per the definitions of the MSMED Act, shall be eligible for assistance under the scheme (subject to present SIDBI guidelines applicable for financing units graduating out of medium scale).
- Client beneficiaries graduating out of medium scale post investment shall be eligible.
- Client beneficiaries should have satisfactory track record of past performance and sound financial position and should not be in default to institutions/banks.
- Client beneficiaries should have minimum investment grade rating as per extant loan policy of the bank.

Eligible projects

- **Energy efficiency investment** – capital expenditure projects that allow energy consumers (MSMEs) to use less energy for achieving the same level of energy service (output). It is possible to distinguish different categories of EE investments for which eligible criteria are defined below:
 - a. **Retrofitting of existing installations** are investment leading to the reducing of overall energy consumption of n installation, such as
 - On site co-generation of heat and electricity,
 - Rehabilitation o boilers,
 - Process improvements including enhanced controls,
 - Rehabilitation of steam distribution systems,
 - Installation of new chillers,
 - Implementation of Energy Management Systems,
 - Rehabilitation of power distribution systems,
 - Improvement in combustion efficiency of fuels, etc.

They also deal with energy efficiency measures in buildings such as reduction of energy wastes, rehabilitation of air conditioning systems, efficient use of lighting equipments, etc.

Investments that concerns the retrofit of existing installations are eligible provided that the demonstrate significant energy savings (at least 10% as compared to the pre-investment level)

- b. **Modification of processes with production capacity expansion** may lead to an increase of overall energy consumption of the installation, but these investments also generate a reduction in specific energy consumption, i.e. the energy quantity used to produce one unit of output; for instance a modification of manufacturing process from wet to dry in the cement industry with a production capacity expansion. These investments have two main goals: first to increase production capacity, and second to generate environment or energy benefits.

EE investments that also increase production capacity are also eligible provided that they reduce the specific energy consumption (i.e. energy consumption per unit of output) as compared to the old equipment by a minimum of 10%.



- c. Greenfield EE projects, which adopt better EE technologies in line with international EE standards if possible, or which prove to be significantly better than the performance of similar Indian industries.

Green field projects are eligible provided that they can be considered as pilot demonstration projects, likely to be adopted by other MSMEs. Green and energy efficient buildings may also fall into this category. They will be considered on a case by case basis.

- **Renewable energy projects** which substitute local and renewable energy sources to fossil fuel are also eligible to the project, provided that they fit the general criteria of the Project (MSME investments beyond a maximum amount).
- **Duly validated Clean Development Mechanism (CDM) projects** at cluster level, involving a change in the process and technologies as a whole duly supported by technical consultancy, are eligible for coverage on a case by case basis.
- General criteria (applicable to all EE, RE & CDM projects)
 - If a substantial part of the project (>50% of total costs) is eligible for coverage under the scheme, entire project may be considered for financing under the scheme.
 - The proposals under Energy Efficiency Scheme shall also be eligible for benefits under Govt. of India Schemes if eligible under the respective schemes.

6.4 Details of Beneficiaries of these Schemes

SIDBI, Kolhapur has provided finance to many foundry units under these schemes. Details of some the beneficiaries are as follows:

Table 7: Beneficiaries of SIDBI's EE Finance Schemes

Sr. No.	Name of Unit	Finance Scheme used
1.	Abhijit Casting	AFD – SIDBI Energy Efficiency Line of Credit
2.	Geeta Pumps	JICA line of credit
3.	S. S. Industries	JICA line of credit
4.	Shimpukade Metals Pvt. Ltd.	General fund
5.	Unimetal Casting Ltd.	JICA line of credit
6.	Shimpukade Engineering	AFD – SIDBI Energy Efficiency Line of Credit



7. Shortlisting MSME Foundry Units for Detailed Energy Audit

In order to select foundry units for detailed energy audit following selection criteria has been suggested.

Table 8: Selection Criteria

Sr. No.	Condition	Marks
1.	Unit should be a MSME unit as per MSMED Act 2006	30
2.	Unit should have SSI registration	10
3.	Annual production of the units should be at least 250 MT	10
4.	Units should have satisfactory track record of past performance and sound financial position	10
5.	Unit should have willingness for implementing the demo projects either through self-finance or through bank loan	20
6.	Unit should be ready to share (showcase) the technology implemented under demo project to other units	20
7.	Total	100

Fulfilling condition no. 1 will be mandatory for the unit. Unit scoring more than 60 marks shall be considered for the detail energy audit. Incase more than required number of units qualify for the detailed energy audit best 5 having representation of all types (e.g. 1 for cupola furnace, 1 for induction furnace) in consultation with CCC and SIDBI should be selected.



Annexure 1: List of Foundry Units in Kolhapur Foundry Sector

Sr. No.	Area	Name of Industry	Address
1	Dr. Patangrao Kadam Ind. Estate, Sangli	Shubham Industries	Pl. No. 109, 110, Dr. Patangrao Kadam Ind. Estate, Palus
2	Dr. Patangrao Kadam Ind. Estate, Sangli	Thorat Enterprises	PI No 120/128, Dr. Patangrao Kadam Audyogik Vasahat Palus
3	Dr. Patangrao Kadam Ind. Estate, Sangli	Vijay Engg. Works	PI No 59/60, Industrial Estate Palus
4	Dr. Patangrao Kadam Ind. Estate, Sangli	Shree Kedar Metal Foundries	Gat No. 49, Nr. Ind Estate, Palus
5	Dr. Patangrao Kadam Ind. Estate, Sangli	Shree Laxmi Cast Alloys	PI No 6/7, Dr. Patangrao Kadam Ind. Estate Palus
6	Dr. Patangrao Kadam Ind. Estate, Sangli	Vikrant Metal Industries	Dr. Patangrao Kadam Ind. Estate, Palus
7	Gokul Shirgaon	Jadhav Industried	S-32/5 Nerli end of MIDC, Gokul-Shirgaon, Kolhapur
8	Gokul Shirgaon	Nirmala Enterprises	D 58, M I D C Gokul Shirgaon, Kolhapur
9	Gokul Shirgaon	Samir Casting	G 65, M I D C Gokul Shirgaon, Kolhapur
10	Gokul Shirgaon	A B K Metal	H-11, M I D C Gokul Shirgaon, Kolhapur
11	Gokul Shirgaon	Bespask Engineers Pvt. Ltd.	B 15, M I D C Gokul Shirgaon, Kolhapur
12	Gokul Shirgaon	Chougule Foundries	B 34, M I D C Gokul Shirgaon, Kolhapur
13	Gokul Shirgaon	Chougule Steels Pvt Ltd	G-103/1 M I D C Gokul Shirgaon, Kolhapur
14	Gokul Shirgaon	Chougule Steels Pvt. Ltd.	G 166, M I D C Gokul Shirgaon, Kolhapur
15	Gokul Shirgaon	D. B. & Sons..	F 20, M I D C Gokul Shirgaon, Kolhapur
16	Gokul Shirgaon	Hindustan Castings	D 19, M I D C Gokul Shirgaon, Kolhapur
17	Gokul Shirgaon	Karsons Auto Industries Pvt Ltd	W-101/102 M I D C Gokul Shirgaon, Kolhapur
18	Gokul Shirgaon	Maruti Products	F 29, M I D C Gokul Shirgaon, Kolhapur
19	Gokul Shirgaon	Masterpiece Castings Pvt. Ltd.	F 31, M I D C Gokul Shirgaon, Kolhapur
20	Gokul Shirgaon	Mather & Platt Pumps Ltd.	E 25, M I D C Gokul Shirgaon, Kolhapur
21	Gokul Shirgaon	Modern Metal	H-28 M I D C Gokul Shirgaon, Kolhapur
22	Gokul Shirgaon	Monark Steels	G-98 M I D C Gokul Shirgaon, Kolhapur
23	Gokul Shirgaon	Paragon Founders	G-33 M I D C Gokul Shirgaon, Kolhapur
24	Gokul Shirgaon	Parikh Metalics (P) Ltd	G-88 M I D C Gokul Shirgaon, Kolhapur

Sr. No.	Area	Name of Industry	Address
25	Gokul Shirgaon	R. K. Enterprises	B 66, M I D C Gokul Shirgaon, Kolhapur
26	Gokul Shirgaon	R. R. Industries	B 31, M I D C Gokul Shirgaon, Kolhapur
27	Gokul Shirgaon	Siddhivinak Foundries & Engg.Works	W-1 Gokul-Shirgaon,MIDC,Kolhapur
28	Gokul Shirgaon	S. M. Foundries	J 11115, M I D C Gokul Shirgaon, Kolhapur
29	Gokul Shirgaon	Sangram Metal Processes	Gat No. 578, Tamgaon, Post, Gokul Shirgaon Office, Pl. No. E 13, M I D C Gokul Shirgaon, Kolhapur
30	Gokul Shirgaon	Saraswati Metal Industries	J 42, M I D C Gokul Shirgaon, Kolhapur
31	Gokul Shirgaon	Shimpukade Metals Pvt. Ltd.	B 16, M I D C Gokul Shirgaon, Kolhapur
32	Gokul Shirgaon	Sukrut Founders Unit 2	C 26, M I D C Gokul Shirgaon, Kolhapur
33	Gokul Shirgaon	Tarlekar Engineering Pvt. Ltd.	B 23, M I D C Gokul Shirgaon, Kolhapur
34	Gokul Shirgaon	The Kolhapur Casting	F 30/1, M I D C Gokul Shirgaon, Kolhapur
35	Gokul Shirgaon	Unique Industries	J 7, M I D C Gokul Shirgaon, Kolhapur
36	Gokul Shirgaon	Vishwakiran Industries	B 74/2, M I D C Gokul Shirgaon, Kolhapur
37	Ichalkaranji	Chandrakant Industries	18/287, Station Rd., Ichalkaranji
38	Ichalkaranji	Ganesh Quality Machines Pvt. Ltd.	Tardal, R. K. Nagar, Ichalkaranji
39	Ichalkaranji	Milind Industries	Tardal, R. K. Nagar, Ichalkaranji
40	Ichalkaranji	Padmavati Founders	C.o Ich Ferro Casting, Opp. Jaija Palace, Jawahar Nagar, Ichalkaranji
41	Ichalkaranji	Raj- Rajeshwari Founders	10/1090, Rajrajeshwari Nagar, Nr. Guru Chitra Mandir, Ichalkaranji
42	Ichalkaranji	Sanjay Founders (Pvt.) Ltd	Ganga Nagar, Ichalkaranji
43	Ichalkaranji	Shri Ganesh Foundry Pvt Ltd	26, Industrial Estate, Ichalkaranji
44	Kagal 5 Star MIDC	Anshul Steel Ltd	B - 135, Five Star M I D C, Kagal
45	Kagal 5 Star MIDC	Radiance Allumina Pvt Ltd	A - 233, Five Star M I D C, Kagal
46	Kagal 5 Star MIDC	Sound Casting Pvt Ltd	C - 10, Five Star M I D C, Kagal
47	Kagal 5 Star MIDC	Mangal Metal Industries	PI No - A - 87, Five Star M I D C, Kagal
48	Kagal 5 Star MIDC	Mantri Autocast	Kagal
49	Kagal 5 Star MIDC	Yash Associates	A 21, Five Star M I D C, Kagal
50	Kagal 5 Star MIDC	Aarati Industries	B-1/B-2, Five Start MIDC Kagal, Kolhapur-416216
51	Kupwad, Sangli	B. K. Engg. & Fabricators	H-69 M I D C, Kupwad, Sangli
52	Kupwad, Sangli	Bide Cast Mech	Pl. No. 93, Industiral Estate, Sangli
53	Kupwad, Sangli	Hemdeep Enterprises	J 42, M I D C, Aera, Kupwad, Sangli
54	Kupwad, Sangli	Jsons Foundry Pvt. Ltd.	G 13, M I D C, Kupwad, Sangli
55	Kupwad, Sangli	Maroo Engg. Associates Pvt Ltd	K-11 M I D C, Kupwad, Sangli

Sr. No.	Area	Name of Industry	Address
56	Kupwad, Sangli	Omkar Industries	J 1, M I D C, Kupwad, Sangli
57	Kupwad, Sangli	R. S. Metals	F 28, M I D C, Kupwad, Sangli
58	Kupwad, Sangli	Ray Founders	L 15, M I D C, Kupwad, Sangli
59	Kupwad, Sangli	S. S. Metals	E-2/20 M I D C, Kupwad, Sangli
60	Kupwad, Sangli	Shah Precicast Pvt. Ltd.	E 35, M I D C, Kupwad, Sangli
61	Kupwad, Sangli	Shri Balaji Ind.	H-74 M I D C, Kupwad, Sangli
62	Kupwad, Sangli	Shri Datta Metal Works	Plot No - 131 / 133, Sangli
63	Kupwad, Sangli	Suyesh Casting	H-15 M I D C, Kupwad, Sangli
64	Kupwad, Sangli	Trimurti Engineering & Tubes Pvt. Ltd.	195/6, Vasantdada Industrial Estate, Sangli
65	Kupwad, Sangli	Tulsi Foundries Ltd.	E 2, M I D C, Kupwad, Sangli
66	Miraj MIDC	Balaji Core Industries	D-80 M I D C, Miraj
67	Miraj MIDC	Durgade Castings	D 11, M I D C, Miraj
68	Miraj MIDC	Fine Manufacturing Industries	B 7/12, M I D C, Miraj
69	Miraj MIDC	Hes Metal Works	W-36(a) M I D C, Miraj
70	Miraj MIDC	Jagadeesh Iron & Steel Pvt Ltd	D-23 M I D C, Miraj
71	Miraj MIDC	Laxmi Narayan Foundry	Pl. No. A 13, M I D C, Miraj
72	Miraj MIDC	Mahabal Metal Pvt Ltd	Plt No 23 M I D C, Miraj
73	Miraj MIDC	Omkar Metal	C-15 M I D C, Miraj
74	Miraj MIDC	Presscast	46, M I D C, Miraj
75	Miraj MIDC	Purva Metal	C - 37, G. M. Ind. Estate, M I D C, Miraj
76	Miraj MIDC	Rajashree Foundry	D 50, M I D C, Miraj
77	Miraj MIDC	Shree Ganesh	D-59 M I D C, Miraj
78	Miraj MIDC	Shri Ram Metals	Plt No 7/4 M I D C, Miraj
79	Miraj MIDC	Suyash Iron & Steel Pvt Ltd.	Plot No. C-62, MIDC, Miraj-416410
80	Miraj MIDC	T. N. T Metals	101, Govindraoji Marathe Ind. Estate, M I D C, Miraj
81	Miraj MIDC	Taysons Industries	Plt No D-13 M I D C, Miraj
82	Miraj MIDC	Vinayak Foundry	71, M I D C, Miraj
83	Miraj MIDC	Vinayak Industries.	P. No. 43, M I D C, Miraj
84	Other	Gemini Consortium	1039/1, E, Nr. Dukes Corner, Bagal Chowk, Kolhapur
85	Other	Genuine Engineers	Kolhapur
86	Other	Girnar Alloys	129, Shinoli B. K., Tal- Chandgad , Dist- Kolhapur Shinoli
87	Other	Melting Point	Gat No. 625, At. Kushire Post Panhala, Dist. Kolhapur
88	Other	Menon & Menon Ltd.	Vikram Nagar, Kolhapur
89	Other	Pol Metal Industries	2896, B Ward, Jawahar Nagar, Kolhapur
90	Other	Prakash Fabricators	1034, E, Rajaram Rd., Kolhapur

Sr. No.	Area	Name of Industry	Address
91	Other	Ratna Sagar Foundry	A-10 Kherdi M I D C
92	Other	Samarth Founders & Engineers	S No. 108/1, Shinoli (Bk) Tal Chandgad Dist. Kolhapur, Shirol
93	Other	Shree Ganesh Foundry Pvt. Ltd.	Pl. No. 48, Jaysingpur
94	Other	Super Craft Foundry	Plt No - 90 , L K Akiwate, Ind. Estate Jaysingpur
95	Other	Union Engineering	1036, E , Rajaram Rd., Kolhapur
96	Other	United Castings	2131/ A / E, Vikram Nagar, Kolhapur
97	Parvati Industrial Estate	Unimetal Casting Ltd.	Pl. No. 82 To 85 F, Parvati Co - Op Ind. Estate Yadrav
98	Parvati Industrial Estate	Unimetal Castings Ltd.	Pl. No. 6, Sector No. E, Parvati Ind. Estate, Yadrav
99	Shirol MIDC	Abhijeet Casting Pvt.ltd	Plotno.9, R.s.no.586, Behind Navjeevan Pat.sty.M I D C Shirol , Kolhapur
100	Shirol MIDC	Akshay Metals	J-31 ,M.I.D.C. Shirol , Kolhapur
101	Shirol MIDC	Alloy Steels	2/4, M.I.D.C.Shirol,Kolhapur
102	Shirol MIDC	Anand Steel Rerolling Mills	92,M.I.D.C. Shirol , Kolhapur
103	Shirol MIDC	Arjay Alloys	B-36,M.I.D.C. Shirol , Kolhapur
104	Shirol MIDC	Gnat Foundry	4/1,M I D C Shirol , Kolhapur
105	Shirol MIDC	Mantri Metalics Pvt. Ltd.	F 10/1, M I D C Shirol , Kolhapur
106	Shirol MIDC	Shivdatta Founders	W 45, M I D C, Shirol, Kolhapur
107	Shirol MIDC	Tough Casting Pvt. Ltd.	E 68, M I D C Shirol , Kolhapur
108	Shirol MIDC	Ashapura Castings	F 25 /1, M I D C Shirol , Kolhapur
109	Shirol MIDC	Bhairinath Industries	B-20/1, M I D C Shirol , Kolhapur
110	Shirol MIDC	C.K.P. Industries	G-38,M.I.D.C. Shirol , Kolhapur
111	Shirol MIDC	Caspro Metal Industries Pvt Ltd	E-1 M I D C Shirol , Kolhapur
112	Shirol MIDC	Castall Industries	E 7, M I D C Shirol , Kolhapur
113	Shirol MIDC	Casting Combine	W 18. M I D C Shirol , Kolhapur
114	Shirol MIDC	Chandrakant Foundries.	1039, E, Rajarm Rd., Kolhapur
115	Shirol MIDC	Chougule Industries	F 6 M I D C Shirol , Kolhapur
116	Shirol MIDC	Consolidated Eutectics .	33, M I D C Shirol , Kolhapur
117	Shirol MIDC	D K Industries	D 66, M I D C Shirol , Kolhapur
118	Shirol MIDC	Die Tech Enterprises	C 39/1, M I D C Shirol , Kolhapur
119	Shirol MIDC	Enpro Enterprises	W 5, M I D C Shirol , Kolhapur
120	Shirol MIDC	Foundry Sales & Services	G 6, M I D C Shirol , Kolhapur
121	Shirol MIDC	Gainmax Ferrocast Pvt.Ltd.	D-4/3/2,M.I.D.C. Shirol , Kolhapur
122	Shirol MIDC	Ganesh Iron Industries	B 40, M I D C Shirol , Kolhapur
123	Shirol MIDC	Gangadhar Alloy Pvt.ltd.,	C /13/2, M I D C Shirol , Kolhapur
124	Shirol MIDC	Geeta Pumps Pvt Ltd.	B-17 M I D C Shirol , Kolhapur
125	Shirol MIDC	Indu Engineers	C-56,M.I.D.C. Shirol , Kolhapur
126	Shirol MIDC	Jain & Jain Industries	4/2 ,M.I.D.C. Shirol , Kolhapur
127	Shirol MIDC	Karveer Engg. Ind. Pvt Ltd	G-44 M I D C Shirol , Kolhapur
128	Shirol MIDC	K & K Foundry Pvt.Ltd	D-49/1 M.I.D.C.Shirol,Kolhapur

Sr. No.	Area	Name of Industry	Address
129	Shiroli MIDC	Krum Alloy Pvt. Ltd.	W-48,M.I.D.C. Shiroli , Kolhapur
130	Shiroli MIDC	Kehevav Steels Pvt. Ltd.	F 28/1, M I D C Shiroli , Kolhapur
131	Shiroli MIDC	Kohinoor Metallics	Pl. No. 31, M I D C Shiroli , Kolhapur
132	Shiroli MIDC	Kwality Castings	B 43, M I D C Shiroli , Kolhapur
133	Shiroli MIDC	Laxmi Metals	A 1, M I D C Shiroli , Kolhapur
134	Shiroli MIDC	Mane & Mane Industries	A 16, M I D C Shiroli , Kolhapur
135	Shiroli MIDC	Manoj Industries	B 30, M I D C Shiroli , Kolhapur
136	Shiroli MIDC	Mayura Steel Pvt.Ltd	E-3,M.I.D.C. Shiroli , Kolhapur
137	Shiroli MIDC	Mayuresh Engineering Works	F 54, M I D C Shiroli , Kolhapur
138	Shiroli MIDC	Menon Metalliks Pvt.ltd.,	D 14, M I D C Shiroli , Kolhapur
139	Shiroli MIDC	Menon Piston Ltd.	182, M I D C Shiroli , Kolhapur
140	Shiroli MIDC	Mihir Auto Components	F-4,M.I.D.C. Shiroli , Kolhapur
141	Shiroli MIDC	New Perfect Founders	E-72 M I D C Shiroli , Kolhapur
142	Shiroli MIDC	Nipurn Engineering Pvt. Ltd.	Pl. No. C 22, M I D C Shiroli , Kolhapur
143	Shiroli MIDC	Nita Instruments	W-12, M.I.D.C.Shiroli,Kolhapur
144	Shiroli MIDC	Padmavati Engineering Products	586/2, H. M. T. Rd. M I D C Shiroli , Kolhapur
145	Shiroli MIDC	Pillay Enterprises	W 60, M I D C Shiroli , Kolhapur
146	Shiroli MIDC	Popular Founders	E 37, M I D C Shiroli , Kolhapur
147	Shiroli MIDC	Prashant Enterprises	Pl. No. 18, Behind M S E B Office, M I D C Shiroli , Kolhapur
148	Shiroli MIDC	Pratap Enterprises	A-32/1&2 M I D C Shiroli , Kolhapur
149	Shiroli MIDC	Prakash Steel Yard	E-8, M.I.D.C.Shiroli,Kolhapur
150	Shiroli MIDC	Precicast	A 1, M I D C Shiroli , Kolhapur
151	Shiroli MIDC	Quality Casting	B 43, M I D C Shiroli , Kolhapur
152	Shiroli MIDC	R S Z Industries	W 50, M I D C Shiroli , Kolhapur
153	Shiroli MIDC	Ranjeet Machine Tools	W 94, M I D C Shiroli , Kolhapur
154	Shiroli MIDC	Ravi Enterprises	890/25, Bhd. Menon Piston Ltd. Nagaon, M I D C Shiroli , Kolhapur
155	Shiroli MIDC	Ridhi Sidhi Industrial Services	C-22/1 ,M.I.D.C. Shiroli , Kolhapur
156	Shiroli MIDC	Renown Founders	A 1, M I D C Shiroli , Kolhapur
157	Shiroli MIDC	Rohini Metal Industries	C 58, M I D C Shiroli , Kolhapur
158	Shiroli MIDC	S. J. Iron & Steels Pvt. Ltd.	C 8, M I D C Shiroli , Kolhapur
159	Shiroli MIDC	S. K. P. Industries	C 53, M I D C Shiroli , Kolhapur
160	Shiroli MIDC	Saroj Castings Pvt.ltd	C-26, M I D C Shiroli , Kolhapur
161	Shiroli MIDC	Saroj Iron Industries	C-25/26 M I D C Shiroli , Kolhapur
162	Shiroli MIDC	Saroj Iron Industries Unit 2	Pl. No. F 11, M I D C Shiroli , Kolhapur
163	Shiroli MIDC	S. B. Reshellers Pvt. Ltd.	D-5, M.I.D.C.Shiroli,Kolhapur
164	Shiroli MIDC	Shagun Castings Pvt.Ltd.	G-9,M.I.D.C. Shiroli , Kolhapur
165	Shiroli MIDC	Shilp Enterprises	D-35 M I D C Shiroli , Kolhapur



Sr. No.	Area	Name of Industry	Address
166	Shiroli MIDC	Shree Datta Engineering Corporation	2/2, M I D C Shiroli , Kolhapur
167	Shiroli MIDC	Shri Datta Founders & Engineers	B 33, M I D C Shiroli , Kolhapur
168	Shiroli MIDC	Shri Dut Engg. Corporation	Plot No.2/2, M I D C Shiroli , Kolhapur
169	Shiroli MIDC	Shri Sperotech Pvt. Ltd.	D 31, M I D C Shiroli , Kolhapur
170	Shiroli MIDC	Shri Ram Foundry	
171	Shiroli MIDC	Sidharaj Engineering Pvt. Ltd.	F 52, M I D C Shiroli , Kolhapur
172	Shiroli MIDC	Subodh Pattern Works	W 30, M I D C Shiroli , Kolhapur
173	Shiroli MIDC	Super Seal Industries	F-18, M.I.D.C.Shiroli,Kolhapur
174	Shiroli MIDC	Suri Foundry & Engg. Co,	D-22, , M I D C Shiroli , Kolhapur
175	Shiroli MIDC	Suyash Casting Pvt. Ltd.	G-2,MIDC,Shiroli,Kolhapur
176	Shiroli MIDC	Siddharth Casting	A-24, MIDC, Shiroli, Kolhapur
177	Shiroli MIDC	Sound Casting Pvt.Ltd.	E-2,M.I.D.C. Shiroli , Kolhapur
178	Shiroli MIDC	The Kolhapur Steel Ltd.	Pune Banglor Highway Post M I D C Shiroli , Kolhapur
179	Shiroli MIDC	Tulip Casting Pvt. Ltd.	Pl. No. 29, Opp. S B I, M I D C Shiroli , Kolhapur
180	Shiroli MIDC	Utkarsha Founders	B-12, M I D C Shiroli , Kolhapur
181	Shiroli MIDC	Yash Metallics Pvt.Ltd.(Unit-1)	G-40,M.I.D.C. Shiroli , Kolhapur
182	Shiroli MIDC	Yash Metallics Pvt Ltd (Unit 2)	35/36 M I D C Shiroli , Kolhapur
183	Shiroli MIDC	Yashashree Engineering	W 46/ 47, M I D C Shiroli , Kolhapur
184	Shiroli MIDC	Yashoda Iron Industries	2/3, M I D C Shiroli , Kolhapur
185	Shiroli MIDC	Vidyyut Engineers	G-15,M.I.D.C. Shiroli , Kolhapur
186	Shiroli MIDC	S. V. Enterprises	Plot No.G-51,MIDC,Shiroli,Kolhapur-416122
187	Shiroli MIDC	Karveer Engg. Ind. Pvt Ltd	G-44 M I D C Shiroli , Kolhapur
188	Shiroli MIDC	Shriram Foundry Ltd.	47, Shivaji Park, Kolhapur
189	Shiroli MIDC	Yashwant Castings	W 46, M I D C Shiroli , Kolhapur
190	Shivaji Udyam Nagar	Bhavani Iraon Industries (P) Ltd.	1325/a, B, Shivaji Udyam Nagar, Kolhapur
191	Shivaji Udyam Nagar	Dhananjay Metal Works	1029/ B -3 A, Gavati Mandai, Udyam Nagar Kolhapur
192	Shivaji Udyam Nagar	Hudli & Sons Auto Engg. Pvt. Ltd.	1325/9, E, Shivaji Udyam Nagar, Kolhapur
193	Shivaji Udyam Nagar	D. B. Liners	1325/49, Shivaji Udyam Nagar, Kolhapur
194	Shivaji Udyam Nagar	D. M. Foundries	Pl. No. 1, Shivaji Udyam Nagar, Kolhapur
195	Shivaji Udyam Nagar	Kawade Iron Works	1243/29 E. Ward, Shivaji Udyamnagar Kolhapur
196	Shivaji Udyam Nagar	M. K. Iron Foundry	1243/2, C, Shivji Udyam Nagar, Kolhapur
197	Shivaji Udyam Nagar	Master Pattern Works	1326/3, Shivaji Udyam Nagar, Kolhapur
198	Shivaji Udyam Nagar	Prime Industries.	1243/10, Shivaji Udyam Nagar, Kolhapur
199	Shivaji Udyam	R. A. Somvanshi Engg. Works	1243/2 B, Shivaji Udyam Nagar, Kolhapur

Sr. No.	Area	Name of Industry	Address
	Nagar		
200	Shivaji Udyam Nagar	Satwekar Industries	1243/ A A, Shivaji Udyam Nagar, Kolhapur
201	Shivaji Udyam Nagar	Shakuntara Metal Industries	1325/113, Shivaji Udyam Nagar, Kolhapur
202	Shivaji Udyam Nagar	Uchagaonkar Iron Works	30, Shivaji Udyam Nagar, Kolhapur
203	Shivaji Udyam Nagar	Vishvakiran Metal Industries	1243/1 B, Shivaji Udyam Nagar, Kolhapur
204	Shivaji Udyam Nagar	Yashwant Iron & Steel Works Ltd.	1325 /46, B, E Ward, Shivaji Udyam Nagar, Kolhapur
205	Shri Laxmi Indst. Estate	Bharat Auto Industries	Plt No C-40 Laxmi Industrial Estate. Hatkanangale
206	Shri Laxmi Indst. Estate	Bharath Auto Industries	PI No 40, Phase 1, Sector - C Laxmi Industrial Estate. Hatkanangale
207	Shri Laxmi Indst. Estate	Magna Industries	Plt No 65/66, Sector - A, Laxmi Industrial Estate. Hatkanangale
208	Shri Laxmi Indst. Estate	Malati Foundars Pvt Ltd	PI No 25 To 29, Sector - A , Phase -1st Laxmi Industrial Estate. Hatkanangale
209	Shri Laxmi Indst. Estate	Om Founders	PI No 93-94,sector - B,phase -1st Laxmi Industrial Estate. Hatkanangale
210	Shri Laxmi Indst. Estate	Pragati Founders Pvt Ltd	Plt-42, Sector- A, Phase-1 Laxmi Industrial Estate. Hatkanangale
211	Shri Laxmi Indst. Estate	Samarth Fabricators & Engineers	Plot No. 70, 1st Phase, Sector-B, Laxmi Industrial Estate, Hatkanangale
212	Shri Laxmi Indst. Estate	Rucha Founders	Plt-101/105 Phase-1, Sector-a Laxmi Industrial Estate. Hatkanangale
213	Uchagaon	Ghatge Patil Industries Ltd.	Uchagaon,Kolhapur-416005
214	Vasantdada Ind Estate, Sangli	Excel Engineers	190/4, 191/4, Nr. Shivsadan, Vasantdada Ind Estate, Sangli
215	Vasantdada Ind Estate, Sangli	Pragati Industries	PI. No. 134, Vasantdada Industrial Estate, Sangli
216	Vasantdada Ind Estate, Sangli	Sai Enterprises .	PI. No. 74, Vasantdada Industrial Estate, Sangli
217	Vasantdada Ind Estate, Sangli	Shri Metal Works	[pl. No. 163/164, Vasantdada Industrial Estate, Sangli
218	Vasantdada Ind Estate, Sangli	Trimurti Engineering & Tubes Pvt. Ltd.	195/6, Vasantdada Industrial Estate, Sangli
219	Y. P. Power Nagar	Jaypal Industries	G-2,Kolhapur Udyam co-operative ,Society, Y.P.Power Nagar,New Industrial Estate,Kolhapur-416008
220	Y. P. Power Nagar	Melting Centre	Gat No 678, A/p Kushire, Tal Panhala, Dist Kolhapur Kolhapur Office: # Block No.12,Y.P.Power Nagar,Kolhapur-08
221	Y. P. Power Nagar	Amol Industries	Kolhapur
222	Y. P. Power Nagar	Deepanjali Metals	S. No. 107/1, Shinoli (Bk) Tal Chandgad, Dist., Kolhapur, Shinol
223	Y. P. Power Nagar	Deshpande Engineering Works	136, Ind. Estate, Hotgi Rd., Solapur

Sr. No.	Area	Name of Industry	Address
224	Y. P. Power Nagar	Jadhav Iron Works	38, Y. P. Power Nagar, Kolhapur
225	Y. P. Power Nagar	Micrometal Industries	43, Y. P. Power Nagar, Kolhapur



Annexure 2: List of Energy Auditors in Sector

Sr. No.	Regn No	Name of the Candidate	Address for Communication	City	Postal code	State	E-mail	Residential Phone No	Mobile
1	EA-7884	Raju Chhaganrao Kulkarni	Raju KulkarniC/o- S.L.KulkarniN-4 , C-36,CIDCO	Aurangabad	431003	Maharashtra	kulkarnirc@rediffmail.com	0240-2443812	09881230130
2	EA-9779	Jayant Vasanttrao Shiradkar	20, SHRINIKETAN COLONY,BEHIND HOTEL AMARPREET,JALNA ROAD,	Aurangabad	431001	Maharashtra	jayantshiradkar@gmail.com	0240-2357567	09325212235
3	EA-9047	Venkatesh Balasaheb Deshpande	743'A' Ward, Flat No. 14,Sanjay Apartment, Near TimberMarket Kaman	Kolhapur	416012	Maharashtra	venkatesh.b.deshpande@gmail.co	02312623373	9822084154
4	EA-8287	Kedar Chandranath Khamitkar	BESIDE LADIES GOVT. ITI COLLEGE BARSHI ROAD , HARANGUL ROAD,LATUR	Latur	413531	Maharashtra	bkkedar@gmail.com	02382223211	09850244701
5	EA-8188	Meenakshi Shreekant Sane	4260, SANE WADANEAR JUMMA MASJID,BRAHMANPURI,	Miraj	416410	Maharashtra	MEENAKSHISANE@YAHOO.IN	02332223867	9422616397
6	EA-9157	Vijay Vinayakrao Darne	6 A ,Shimpla,35, Juhu Versova Link RoadAndheri West	Mumbai	400053	Maharashtra	vjaydarne@yahoo.co.in	02226251194	9869522213
7	EA-9295	Atul Dattatray Vyawahare	Flat No 198, Block no 25, BPCL STAFFCOLONY, AZIZBAUG, CHEMBUR	Mumbai	400074	Maharashtra	vyawaharead@bharatpetroleum.in	022-25996198	09819146864

Sr. No.	Regn No	Name of the Candidate	Address for Communication	City	Postal code	State	E-mail	Residential Phone No	Mobile
8	EA-9449	Rupesh Sadashiv Talekar	B/12, SWAGAT BLDG, CIBA SOCIETY,AMRUT NAGAR,GHATKOPAR (WEST),	Mumbai	400086	Maharashtra	rupesh.talekar@relianceada.com	25173419	9324216589
9	EA-9892	Pravin Shankar Joshi	B/14, Mitrak Srishti CHSL,Sector-I,Mira Road East	Mumbai	401107	Maharashtra	pravin.joshi@usengg.in	02228457524	9819073332
10	EA-10464	Prakash Raghunath Joshi	C-410, DEVDEVESHWAR C H S,TELI GALLY CROSS LANE,ANDHERI EAST,	Mumbai	400069	Maharashtra	jpraghunath@yahoo.com	02226835842	09323487288
11	EA-4669	Pramod Madhukar Deshpande	Flat No B6/7 Paschima ResidencyVittalwadi, Sinhagad RoadHingane Khurd	Pune	411051	Maharashtra	pramodd40@rediffmail.com	020-34347402	9850730650
12	EA-6196	Sitaram Singhal	BT KAWADE ROAD, NANAI BAUGGHORPADI GAON, YELLOW BLOSSOMS SOCIETY	Pune	411001	Maharashtra	srsinghal@suzlon.com	9767918540	9881136442
13	EA-6300	Waman Hemant Karmarkar	1103,A/2,ADARSHA COLONY,STONE BUNGALOW,OPP.PUNE PEOPLE'S BANK,	Pune	411016	Maharashtra	wamanhkarmarkar@yahoo.com	020-25653498	9890927763
14	EA-6344	Udaykumar Dattatraya Watwe	Shri Gopal Vihar Aprtm.Flat No. 304,Nr. Jhala Society,Khothrud	Pune	411029	Maharashtra	udwatwe@kcssl.com	02025448140	9423234545
15	EA-8773	Raju Umakant Nawale	Flat no 9, Rohit Residency,Old Jakat Naka, Chinchwad,	Pune	411033	Maharashtra	ru_nawale@yahoo.com	02027482664	09822517780



Sr. No.	Regn No	Name of the Candidate	Address for Communication	City	Postal code	State	E-mail	Residential Phone No	Mobile
16	EA-9968	Sadashiv Nivratarao Helambe	Flat No. 111, Himalayan House, Fatima Nagar, Solapur Rd. Wanawari	Pune	411014	Maharashtra	shelambe@yahoo.com	09850628905	09850442660
17	EA-10344	Milind Ramakant Vaidya	C-21/6, Kaivalya Society Survey No. 9/10, Kothrud	Pune	411038	Maharashtra	primatec@rediffmail.com	020 25460746,	9822207034
18	EA-10851	Bhushan Ganpat Malandkar	c/o Narayan Madane Survey 82, Sudarshan Nagar Pimple Gurav	Pune	411027	Maharashtra	bginenergy@gmail.com	09923313270,	09766346746
19	EA-10909	Sunil Vishnu Gogate	Flat #3, Surendra Apts Neelkamal Hsg Society Karvenagar	Pune	411052	Maharashtra	svg@acrvt.net		09822519844
20	EA-11108	Sadashiv Hanumant Bhopatkar	1032, Shukrawar Peth, Tilak Road,	Pune	411002	Maharashtra	shbhopatkar@yahoo.com	020 24474427	09823269948
21	EA-9794	Salim Bashir Mulla	303/1-A/46, SAHAYDRI NAGARKHOJA COLONY	Sangli	416416	Maharashtra	brsalim@rediffmail.com	0233-2670328	09423217284
22	EA-9679	Dipak Hanmant Kokate	A/P-VADGAON(J.S) TAL-KHATAV, DIST-SATARA,	Satara	415512	Maharashtra	dipakokate@gmail.com	02161288603	9860832006
23	EA-3042	Bhavana Chittawar	11/5, IT Park, South Ambazari Road	Nagpur	440022	Maharashtra	chittawar@sify.com		9823071702
24	EA-4641	Rakesh Gupta		Nagpur		Maharashtra	-		9422146107
25	EA-2804	Rakesh Desai		Mumbai		Maharashtra			9930033268
26	EA-1276	Rajesh Deshpande	Mumbai	Mumbai		Maharashtra			9322854470

Annexure 3: List of Service Providers

Sr	Name of Industries	Name of Client	Designation	Contact No.	Phone No.	Mail ID	Web	Address	MFG
1	General Kinematic	Ajay Chougule	Country manager	9880291311		acatkasia@yahoo.com	generalkinematics.com	Flat no.101, Fort House, 21st cross, sir M.V.Nagar, T.C.Palya main road, R.M.Nagar, Banglore-560016	Leadership in vibrating process equipment
2	KELSONS	Rohan Pal	Senior Marketing Engineer	9552571474		sales@kelsonsgroup.com	www.kelsonsgroup.com	Plot No.E-22, 23 MIDC, Shirol, Kolhapur-416122	Foundry Equipment
3	OMEGA SANE	Nitin Sane	Director	020-24331197		admin@saneequipments.com	www.ofml.net	28, VIJAY NAGAR COLONY, 2130, SADASHIV PETH, PUNE-411030, MAHARASHTRA	FOUNDRY MACHINERY PVT LTD.
4	New Kessler Engineering Pvt Ltd.	Jagdish Keskar	Sales Manager	9867057989		jkeskar@nekel.net	www.nekel.net	319-322, B Wing, pranik Chambers, Saki vihar Road,	



Sr	Name of Industries	Name of Client	Designation	Contact No.	Phone No.	Mail ID	Web	Address	MFG
								Sakinaka Junction, Andheri East, Mumbai-400072	
5	Baroda Machinery Manufacturers Pvt. Ltd.	Surendra G.Bhaktan	Director	0265-2656590 0265-2638531		bmpvtltd@yahoo.com	www.bmpvtltd.com	506/2-3A, GIDC, Makarpura, Baroda-390010	
6	SINTO ENGINEERING INDIA PVT LTD.	Dilip Borole	Asst. Manager	9890114294	2064701038 41314481	d-borole@sintoindia.com	www.sinto.com	Shops no.43-44, Vastushree Complex, Hyde park, Pune-411037	
7	V-Smart Thermotech Pvt.Ltd	Sunil Dengle	Manager Business Development	9370146506	020-25234337/38	sales@vsmartindia.com , sunildengale@vsmartindia.com	www.vsmartindia.com	A1, 7th Floor, Mahalaxmi Nagar, Mumbai-Bengaluru Highway, Warje,Pune -411058	
9	Patel Furnace & Forging Pvt. Ltd.	Nilesh Vaja	Sales Manager	9737061333	0265-2644864 0265-2640406	patelf@dataone.in / patelf@satyam.net.in	www.pshotblast.com	A/2-510,GIDC, Makarpura, Baroda-10, Gujrat REGD.OFF -4/B Pravasi Estate,	Shot Blast Machine, Air Pollution Control Equipment & Spares

Sr	Name of Industries	Name of Client	Designation	Contact No.	Phone No.	Mail ID	Web	Address	MFG
								Veshwshwar Nagar, Goregaon (E) Mumbai-63	
11	MERA INDUSTRIES	K.Muralidharan	Partner	9844111548	23601238 23607152	areblr@dataone.in areblr78@bsna.in		OFFICE: # 731, Ganapati Nagar, Rajagopal nagar Main road, Peenya III phase, Bangalore-58 FACTORY: # 150A, 2nd 'C'Cross Peenya II Stage, Bangalore-58	Foundry Machinery & Spares
12	Vishwakarma Refractories Pvt. Ltd.	K.Udayakumar	Chief General Manager	9448286471	080-41979900	vrl@bhuwalka.co.in vrl.uday@bhuwalka.co.in		H.O. Bhuwalka Landmark, No.5 Walkar Lane, (on langford road) Richmond Town, Bangalore-41512743	



Sr	Name of Industries	Name of Client	Designation	Contact No.	Phone No.	Mail ID	Web	Address	MFG
16	G.S.Machineries	R.L.Sudhakar		9845513212	080-23203268	sudhakara_rl@yahoo.com		# 55, 1st 'A' Main Road, Shakthi Garden, Mudalapalya, Kalyananagar, Banglore-560072	Foundry Machineries
17	EHP INDIA	T.Sridhar	CEO	9840068234	044-42316495	ehpindia@gmail.com	www.ehp.de	New # 15, North Street, Sriram Nagar, Alwarpet, Chennai-600018	EHP digital Crane Scales
18	Thirumala Precicasta Pvt. Ltd.	N.Rajnikanth Reddy	Manager Commercial	9822530598	0217-2734522 0217-2734523	purchase@thirumalacasting.com info@thirumalacasting.com	www.thirumalacastings.com	Balaji Bhavan, 165-A, Rly Line, Solapur-413001	
20	Indo power	Manojkumar		9328216990 9998694273		manu_inducto@yahoo.co.in indopowerenggs@gmail.com	www.indopower.in www.indiamart.com	Plot No.56-A/4, Phase-1, Road no.B.Bharat Cement Compound, Nr.Bank of india, opp.Shashavt gum Industries, GIDC,	Induction Melting furnace, Spares parts, & Related equipment

Sr	Name of Industries	Name of Client	Designation	Contact No.	Phone No.	Mail ID	Web	Address	MFG
								vatva, Ahmadabad-382445	
21	Premier Casttec	K.A.Ramesh		9845241998	0820-2564159	premiercasttec@gmail.com		Sical Building, Yedabettu, Sastan, Udupi District, Karnataka-576226	
23	Inductotherm (INDIA) Pvt. Ltd.	Ravindra Sagar	Area sales Head	9370985335	0231-2537849	rsangar@inductothermindia.com kolhapur@inductothermindia.com	www.inductothermindia.com	Shantnu plaza plot no.1 E, ward nr. Rajesh motors, Kawalanaka, kolhapur-416003	Induction Furnace
24	Metafore Synthesis ,Nucleus Foundry Services	Nalinee Nene	BE (Met)		0231-2638095	nenenv@bsnl.in		C-19, kolhapur udyam Co-operative society, Y.P.powernagar, kolhapur-416012	

