Annexure 5

December 2009

Needs Assessment Study of Metal casting SMEs in Coimbatore Cluster

[Prepared under Energy Efficiency in Metal Casting in Southern India REEEP Project ID: 107010227)]

Submitted to
REEEP International Secretariat, Vienna

Project Report No. 2009IE05

www.teriin.org

The Energy and Resources Institute

Contents

Needs Assessment Study of metal casting SMEs in Coimbatore Cluster

1.0 Castings sector in India

India is one of the largest producers of castings in the world and accounts for about 8% of the world's castings production. In the year, 2007-08 India's casting production was estimated to be nearly 7.8 Million metric tons. India is the second largest producer of grey iron castings behind China and third largest producer of steel castings in the world.

The various types of castings produced can be categorized into the following types: ferrous, non-ferrous, aluminium alloy, graded cast iron, ductile iron and steel. Castings are mainly used in automobiles, railways, pumps, compressors and valves, diesel engines, cement industry, electrical industry, textile machinery, sanitary pipes and fittings, power generation, construction and many other specialized applications. Grey iron castings account for the major share of total castings market. Nearly 70% of all castings produced are of grey iron.

In India, there are approximately 4,500 foundry units out of which 80% can be classified as small-sale units, 15% as medium-scale units and just 5% as large-sale units. Approximately, 20% of the foundry units have ISO international quality accreditation. There are several foundry clusters in India. Some of the major clusters are Ahmedabad, Batala, Jalandhar, Ludhiana, Belgaum, Chennai, Kolhapur, Rajkot, Coimbatore, Howrah, Agra, Pune and Vijayawada. Most of the clusters are known to cater to a particular type of end-use industry. For example, while the foundries in Ahmedabad make castings for the local textile and pump manufacturing industry, Batala, Jalandhar and Ludhiana mainly produce castings for local machine tools, tractors and agriculture industry. Coimbatore foundries are known for pumps, motors and valve castings.

2.0 Cluster background

Coimbatore, located in the state of Tamil Nadu, is an important industrial cluster in India. The industrial cluster developed in the 1930s, since many textiles and spinning units came up, since the local weather was suitable for yarn processing. Initially, metal casting industry flourished in Coimbatore to cater to the needs of the local textile machinery manufacturers. In 1970s, the wet-grinder was invented in Coimbatore for

grinding of rice and lentils used in local recipes. The motor and drive-system of wet-grinders use casting components. Till date, the cluster is by far the largest producer of wet-grinders in India. Subsequently, major automobile manufacturing units like came up in surrounding areas like TVs, Hyundai, Honda, Leyland, Allwyn Nissan and Mahindras. The setting-up of these automobile units created a great demand for castings as well. The growth of the agricultural sector resulted in a large demand for pumps to irrigate the land. Presently, Coimbatore is the largest cluster manufacturing 'pump-sets' in India for different sectors such as agricultural, residential, municipal and industrial sectors.

A location of Coimbatore within India is shown in the map in Figure 2.1.

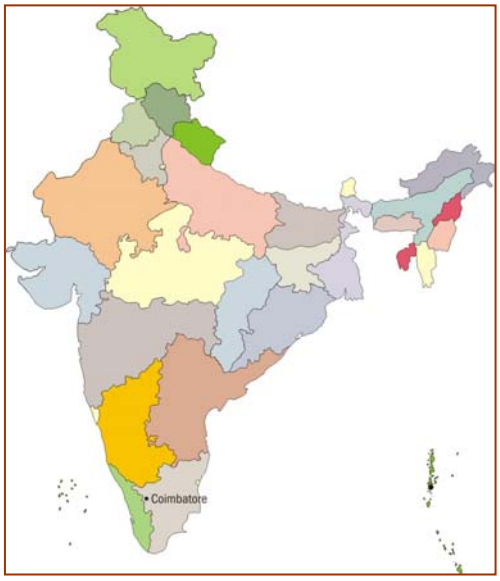

Figure 2.1 Location of Coimbatore

The major concentration of castings units in Coimbatore are found in Avinashi (about 100 units) and Peelamandu areas.

3.0 Methodology

A needs assessment of the cluster was conducted by TERI between the period between August to October 2009. The following casting units were visited for detailed interactions and to identify the major technology and knowledge gaps facing the casting units in the cluster.

- Aquasub Engineering (Texmo Group)
- C.R. I. Pumps
- Aggni Castings
- Amm Alloy
- Lakshmi Rekha Castings

- Mano Industries
- Nandini Castings

In addition, interactions were held with the office bearers of the major industry associations and service providers in the cluster.

4.0 Metal casting industry structure in Coimbatore

There are more than 400 metal casting units in Coimbatore, the majority of which are in the small-scale. The approximate break-up of size-wise distribution of the units are presented in Table 4.1.

Table 4.1 Size-wise categorisation of metal casting units

Large	50 nos
SMEs	350 nos

Most of the casting units cater to the domestic market. However a small number of units are also exporting their products. A break-up of the percentage of units catering to the domestic and/or export market is given in Table 4.2.

Table 4.2. Market-wise Distribution of Units (%)

Domestic Market	90
Export Market	10

An approximate distribution of units producing castings for major different industry segments are provided given in Table 4.3.

Table 4.3. Distribution by industry segment (%)

Automotive	15
Pump-sets	50
Wet-grinders	10
Textile Machinery	10
Jobbing foundries	15

Primary source of energy for metal casting units is power (both grid and captive) power and coke. Small quantities of firewood are also used

5.0 Industry associations

There are a number of industry associations in Coimbatore. The major industry associations are the following:

- SIEMA (The Southern Indian Engineering Manufacturers' Association)
- COINDIA (Coimbatore Industrial Infrastructure Association)

- IIF (The Institute of Indian Foundrymen)
- CODISSIA (The Coimbatore District Small Industries Association)
- TANSTIA (Tamilnadu Small and Tiny Industries Association)
- COSMAFAN (Coimbatore Tiny & Small Foundry Owners Association) &
- COFIOA (The Coimbatore Foundry & Industry Owners Association)

COSMAFAN represents the smaller castings units in the cluster and has about 150 members. The associations work closely with each other to address the common issues facing the industries. Most of the officer-bearers of the associations are also common.

6.0 Issues facing the cluster

Some of the major issues facing the casting units in the Coimbatore cluster as was evident from the needs assessment study, are highlighted below

6.1 Shortage of electricity

Recently, the state of Tamil Nadu has imposed severe restrictions on the use of electric power by the industrial sector. Industries now face load shedding of up to 40% of their maximum demand. The government has also imposed strict time limits on the use of electricity by the industrial units. With these restrictions on power usage and operational time, a majority of the foundries in Coimbatore have been forced to cut down production drastically—for instance, one unit operates its induction furnace for only 18 days in a month. At the same time, the foundry units are under enormous pressure to meet their market commitments.

Under these circumstances, the Coimbatore foundry entrepreneurs are considering reverting to coke-based melting technology as an option. In effect, the current scenario there is a good demand for promoting energy efficient melting furnace design like those developed by TERI.

6.2 Adoption of energy-efficient melting furnaces

The vast majority of the coke-fired melting furnaces (cupolas) in the cluster are of conventional type. These furnaces have either been designed in-house or by local fabricators having poor knowledge of scientific design principles. Invariably the low ash coal is used in the Coimbatore foundry cluster. However, the charge coke percentage was found to be on the higher side for most of the foundries. The charge coke percentage (a measure of energy efficiency of the melting furnace) was found to be more than 11% in most of the foundry units visited by TERI. A

photograph of conventional cupola which consumes higher amount of coke is shown in Figure 6.2.

Figure 6.2 Unscientifically modified cupola

The cluster is showing a new interest in the TERI-designed energy efficient coke-fired melting furnace. In the interactions carried out with the local industry, it was evident that the cluster is looking for energy efficiency improvement in their melting furnaces. Several of the units visited wanted to install the energy efficient furnace successfully demonstrated by TERI in other foundry clusters in India.

6.3 Shortage of manpower

The foundry industry is highly labour intensive and most of the operations are carried out manually (See Figure 6.3). The industry is facing shortage of un-skilled and skilled man-power in recent years. Alternative income generation schemes being promoted by the Government has led to lesser availability of unskilled labour in the state. Skilled manpower also is an issue because of poor working conditions which has an adverse effect on fresh candidates who opt for foundry courses available at government Industrial Training Institutes (ITIs).

Figure 6.3 Conventional charging practices

6.4 Tackling rise of input costs

In the recent past, there was unprecedented and frequent hike in all key inputs to the foundry sector such as pig iron, scrap, coke and ferroalloys which made many foundries to shut down operations. Prices of pig iron, steel scrap, coke, and ferro alloys have all risen by 50-100% in one year. Almost all foundries were forced to cut down production and adopt cost cutting measures. Many foundries that had purchased raw materials at

higher prices earlier are facing extreme hardships since they are forced to sell products at lower prices, corresponding to the current raw material prices.

Energy prices in India are typically the highest amongst the leading foundry producing countries. Although, the individual units have taken several measures to improve energy efficiency, a lot more could to be done. There is a well-felt need for cost-effective technological solutions to improve energy efficiency of the units. Many of the units visited expressed their desire to implement low-cost better housekeeping practices to reduce input costs.

6.5 Producing value-added products

The casting units predominantly produce grey iron, although production of steel, ductile iron and non ferrous castings is increasing. The units are keen to focus on higher valve added castings such as ductile iron to improve profitability and beat competition. The demand for light weight castings is growing, especially in the automobile sector due to increasing demand for fuel efficient cars.

6.6 Meeting environmental norms

The foundry industry is considered to be a polluting industry. Hence the industry has been under severe pressure from the pollution control boards to install pollution control devices. Although, the awareness to control pollution has increased among the industry there is a need to develop and promote cost-effective pollution control systems for the industry. Closer partnerships between industry and academic institutions would help in addressing the environmental challenges facing the foundry industry.

6.7 Financing of new investments/expansions

The casing industry will continue to be a sunrise industry in developing countries like India and China for many years to come because of the growth in automobile and infrastructure sectors. In recent times, the industry has been facing severe challenge due to rising cost of inputs and shrinking exports due to the global economic slowdown. The industry is keen to focus on new manufacturing strategies and rationalize production processes, cut costs and introduce innovations. However lack of capacity to finance new investment is a major barrier to growth especially to the small and micro units. The future outlook for the larger units is bright due to growing demand for castings within India as well as internationally.