

# **Comprehensive LSPs Mapping Report Morbi Ceramic Cluster**

## **GEF-UNIDO-BEE Project Promoting Energy Efficiency and Renewable Energy in selected MSME clusters in India**

*Prepared for:*  
Bureau of Energy Efficiency



May 2018

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## **Suggested format for citation**

TERI. 2018  
Comprehensive LSPs Mapping Report Morbi Ceramic Cluster  
New Delhi: The Energy and Resources Institute. 33 pp  
[Project Report No. 2017IE08]

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# Abbreviations

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APFC	Automatic Power Factor Controllers
BEE	Bureau of Energy Efficiency
BOP	Best Operating Practices
DIC	District Industries Centre
DPR	Detailed Project Report
EE	Energy Efficiency
GEF	Global Environment Facility
ITI	Industrial Training Institute
LSP	Local Service Provider
MSME	Micro, Small & Medium Enterprises
O&M	Operations & Maintenance
PV	Photovoltaic
RE	Renewable Energy
SWOT	Strengths, Weaknesses, Opportunities, and Threats
TERI	The Energy and Resources Institute
TQM	Total quality management
UNIDO	United Nations Industrial Development Organization
VFDs	Variable Frequency Drives



# 1.0 Introduction

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Bureau of Energy Efficiency (BEE) is Promoting Energy Efficiency and Renewable Energy in selected MSME clusters in India under the GEF-UNIDO-BEE Project. A proposal for capacity building of local service providers (LSPs) was submitted by TERI to BEE under GEF-UNIDO- BEE project.

A contract for providing the consultancy services was awarded to TERI by BEE as per the terms of reference given in the Lol No. 13/GEF-UNIDO-BEE/LSP/14/4561 and 13/GEF-UNIDO-BEE/LSP/14/4562 dated 2<sup>nd</sup> August, 2017 for the following Ceramic and Foundry clusters on 26<sup>th</sup> September 2017.

**Table 1.0: Focus sectors/ clusters awarded to TERI**

Sector	Clusters
Ceramic	<ul style="list-style-type: none"><li>• Khurja</li><li>• Morbi</li><li>• Thangadh</li></ul>
Foundry	<ul style="list-style-type: none"><li>• Belgaum</li><li>• Coimbatore</li><li>• Indore</li></ul>

This comprehensive LSPs mapping report of the project outlines the methodology followed for identification and mapping of LSPs based on demand and supply needs of local industries for Morbi ceramic cluster. This report should be read in conjunction with the 'Cluster specific list of LSPs' submitted separately.

The following sections in the report outlines the cluster background, methodology adopted, production process flow-sheet, demand-supply matrix and SWOT analysis for the LSPs in the Morbi Ceramic Cluster.





## 2.0 Background of the cluster

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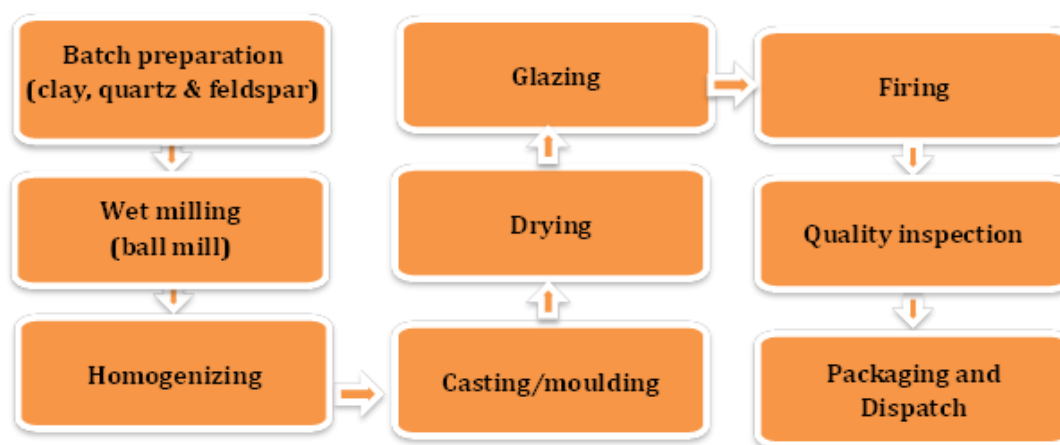
### 2.1 General information

Morbi, located in the state of Gujarat, is the largest ceramic cluster in India. Morbi is 247 km away from Ahmadabad. National Highway no 8/A is flanked by ceramic factories and this cluster is spread up to Wankaner city. The Morbi ceramic cluster produces wall tiles, floor tiles, vitrified tiles, polished glazed vitrified tiles, twin charged tiles, multi-colour charged tiles in various formats starting from 20 x30 cm to 120 x180 cm in a wide range of designs and colours. It also produces sanitary ware, industrial ceramics and technical ceramic products. The basic raw materials for manufacturing of tiles like red and black soil are available in surrounding areas of Morbi while lignite is procured from Kutch, not far away from Morbi.

There are about 459 units operating in the cluster. Out of these around 178 are wall tiles units, 52 are floor tiles units, 26 are vitrified tile units and 43 are sanitary ware units. There are about 40 units which manufacture spray dried mud which is supplier to the smaller units. In addition, there are about 120 units producing roofing tiles also but their production is seasonal units.

### 2.2 Production process

Manufacturing of ceramic item uses wide range of raw material combination to produce different shape, size and colour. It requires both electrical and thermal energy at different stages of the process to operate the ball mill, press machines, kilns, cutting & finishing machines and utilities such as motors, pumps air compressor etc. Ceramic manufacturing process primarily consists of mould preparation, body material preparation, shaping, drying and firing. Typical process flow chart is shown with figure 2.2.



**Figure 2.2:** Typical flow sheet of a Ceramic unit

## 2.3 Major Stake holders

The major stakeholders in the cluster like industry associations, training institutions and government support institutions for MSMEs, identified through secondary literature survey are given below:

### 2.3.1. Industry Association

The industry association working for the development of various ceramic units in the cluster is the Morbi Ceramics Associations. This association is having four divisions i.e. wall tiles division, vitrified tiles division, floor tiles division and sanitary wares division. The association is headed by a President.

The industry associations mainly involved in lobbying for local industry with various government agencies on various issues such as fuel and raw material supply. In addition the association also organises various events such as seminars and workshops.

### 2.3.2. Training Institutions

The following training/coaching institutes are particularly known for offering courses with specialisation in ceramic technology in Morbi.

- **Lukhdhirji Engineering College:** Ceramic technology department of the institute offers three year specialized diploma course. This course covers area of pottery, refractory, glass and enamel. Pottery includes

glaze wall tiles, sanitary wares, crockery wares, electrical insulators and bone china wares.

- **Navkar Computers:** Provide the training in tile designing and printing technology.

### **2.3.3. Government Support Institutions**

Morbi has limited number of government support institutions offering courses related to ceramic technology. Industrial Training Institute (ITI), Morbi is the main government institution related to ceramic industry in the cluster.

- Government Polytechnic College, Rajkot
- MSME – Development Institute, Ministry of Micro, small and medium enterprises (MSME), Government of India
- District Industries Centre (DIC) at Morbi, Surendranagar and Rajkot, Department of Industries and Commerce, Government of Gujarat



## 3.0 Methodology adopted

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### 3.1 Identification and mapping of LSPs

Before the identification and mapping of the LSPs, the project undertook extensive exercise to understand the equipment/sections in the plant where LSPs are used by industry. TERI interacted with key stakeholders like progressive industrial entrepreneurs, cluster-level industry associations and selected LSPs to understand the needs and supply of LSPs in the cluster.

In order to understand the equipment/sections in the plant, TERI prepared the process flow-diagram for the ceramic industries. The identification of the major equipment/sectors and services used was done in consultation with industry stakeholders.

TERI then prepared structured survey questionnaires, separately for MSMEs and service providers, to understand the demand supply gaps for LSPs in the cluster. The MSME and LSP questionnaires used for the survey are provided in Annexure 1 and Annexure 2 respectively.

Efforts were made to classify the LSPs keeping in view the major equipment/sections and related services used by the industry. The structured questionnaires were used for discussions with MSMEs and LSPs to understand the demand and supply side barriers in the cluster.

TERI undertook an extensive survey for collection of cluster level information related to needs of LSPs. Key stakeholders like progressive MSMEs and LSPs were covered in the survey. The inputs from the stakeholders helped in obtaining a holistic view of the demand and supply needs of local industries.

The information about the clusters needs were summarized using structured analytical tools like 'SWOT' and demand-supply matrix. The SWOT analysis helped to determine the strengths, weaknesses, opportunities and threats pertaining to the LSPs in the cluster. The demand-supply matrix was useful to

determine the demand side and supply side constraints with respect to key services at the cluster level.

These analyses helped in better understanding of the gaps in services available locally as well as to identify the capacity building needs of the LSPs for promotion of EE & RE in the cluster. This will help. There was continuous dialogue with the industry association in the cluster to brief them about the gaps identified and remedial measures. The analyses and dialogue also helped to identify potential EE & RE technologies which can be taken up for preparation of detailed project reports (DPRs) under the assignment.

The study was designed in two parts; quantitative survey of LSPs and MSMEs (through structured questionnaire), and qualitative discussion with focused groups, opinion leaders, and a variety of stakeholders of the cluster.

A questionnaire survey of about 20 MSMEs and LSPs was done in the cluster. Some of the MSME and LSPs provided response as per the structured questionnaire while with some it was a generic discussion with regard to the demand-supply requirements of services in the cluster. Sample survey questionnaires filled during the field surveys are enclosed in Annexure 3.

## 4.0 Analysis of LSP segregation based on questionnaire survey

### 4.1 Type of process/technology and role of LSP's

A questionnaire survey was conducted in the cluster to understand the present status of LSPs in the cluster and needs of the local industry. Based on the questionnaire survey, the current LSPs were classified into different categories according to the types (process, utilities, and support services). The information on current LSPs in the cluster is summarized in table 4.1a.

**Table 4.1a:** Types of LSPs in Morbi Cluster

Sr. No	Type of LSPs	Nos.
1	Process equipment – material preparation, drying, Kiln, Glazing/tile designing	36
2	LSPs – electrical utilities (motors, etc.)	11
3	LSPs - mechanical utilities	17
4	Renewable energy solutions	03
5	LSPs – technical /consultancy services	06
	Total	73

The information collected on the LSPs in the cluster was further analyzed to categorize them according to the type of main process/technology commonly in use and the role of LSP. The detailed classification and the types of LSPs and their role are provided in table 4.1b

**Table 4.1b:** Detailed classification of the types of LSPs and their role

Category	Section	Equipment/service	Role of LSP
<b>Process equipment</b>	Wet Grinding	Ball Mill	Manufacture/ sales/ service
		Grinding Media	
	Spray drying	Spray drier	
	Pressing	Automatic Hydraulic Press	
	Drying	Dryers	
	Firing and Baking	Gas/Oil Fired Kilns	
		Burners	
Insulation & Refractory			
		Waste heat recovery	

Category	Section	Equipment/service	Role of LSP
		Control & Instruments for Firing system	
	Tile Printing	Ceramic Tiles Printing Machine	
	Sizing and polishing	Tiles polishing machine Tiles sizing/cutting machine	
<b>Utility equipment</b>	Electrical equipment	Voltage controllers, stabilizers, lighting, APFC etc. Electrical motors Motor rewinding Variable Frequency Drives, Energy monitoring systems	Manufacture/ sales/ service
	Mechanical	Air compressors, Air piping Compressed air system spares and accessories, auto-drain valve, EE Fans Slurry pumps, EE water pumps, spares & service, High-torque Cog Belts, EE bearings	
<b>other services</b>	Awareness programs and training	Government schemes Financing & taxation Environment & energy conservation Technical skill development Energy conservation	Training and technical consultancy
	Consultants	Financial, Energy conservation, technology & process	
	Renewable Energy	Solar PV, solar heaters, solar lighting, waste management	

## 4.2 Mapping needs based on demand and availability of services

Based on the information collected on LSPs, an exercise to analyse the demand side and supply side constraints with respect to services available in Morbi Ceramic Cluster was undertaken. The summary of the analysis is presented in table 4.2.

**Table 4.2:** Demand and supply side analysis of LSPs in Morbi Ceramic Cluster

Sr. No.	Area	LSP	
		Demand side constraints	Supply side constraints
01	Good practices in motor rewinding	Inadequate awareness about the energy savings/benefits of improved electric motor	Low competence level of existing service providers and maintenance



Sr. No.	Area	LSP	
		Demand side constraints	Supply side constraints
		rewinding on energy efficiency and electricity consumption	operators on improved motor rewinding practices
02	Retrofits & new EE/RE technologies	Lack of awareness among MSMEs and service providers on new EE/RE technologies such as VFD in air compressors, high alumina grinding media in ball mills, etc.	Lack of local technical experts on EE/RE technologies. Most service providers are located in Ahmedabad and Rajkot. Therefore, difficulties to interact with LSPs on a regular basis leads to sub-optimal Implementation.
03	Kiln (Burner, automation and waste heat recovery)	There is limited awareness among both LSPs and MSMEs on new energy efficiency technologies in tunnel kilns related to instrumentation and control, waste heat recovery, kiln automation, combustion control and so on	Service providers and maintenance operators of MSMEs do not have knowledge and expertise on benefits of new technologies and they focus mainly on minimising the initial capital cost of new equipment.
04	Best operating practices to save energy	Lack of basic instrumentation and control measures related to measurement of parameters related to power, gas composition, temperature, pressure, flow rate etc. makes it difficult to monitor the energy performance of equipment kilns, motors, air compressors, pumps etc.	Institutional support related to development of capacities of LSPs and technical support to MSMEs are not available at the cluster level at present. This has led to a cadre of local service providers with inadequate knowledge of energy efficient technologies and best operating practices.



## 5.0 SWOT analysis of LSPs

A SWOT (Strengths, Weaknesses, Opportunities and Threats) analysis was done to understand the demand supply gaps of the technical services available in the cluster. The SWOT analysis table is given in table 5.0

**Table 5.0:** SWOT analysis LSPs Morbi Cluster

Current situation		Future	
Strengths	Weaknesses	Opportunities	Threats
Large number of Ceramic industries present in the cluster	Lack of training/exposure latest developments like BoPs, preventive maintenance, lean manufacturing practices	Industry associations are active  Disciplined work culture	Equipment selected based on lowest capital cost rather than life-cycle cost
	Technical representatives of large process machinery are not present in the cluster. Only sales representatives are available	Willingness to learn/acquire new skills	Low cost/low competence service providers
Innovative entrepreneurs willing to accept EE/RE technologies	Colleges and technical training institutes are limited  Lack of knowledge of developments related to energy efficient technologies (IE3 motors, VFD, low thermal mass kiln and automation) and best operating practices		
Diversity and design/product range according to the need of external market.	Non-availability of high grade raw material  Obsolescence of technologies adopted coupled with employment of inefficient and out dated equipment	Increased level of process automation  Increase energy efficiency; improving the quality thus reduce rejections and waste.  Dissemination of best practices	Competition from other countries including China  Wide variation in product type  Generation of large ceramic wastes and non-

Current situation		Future	
Strengths	Weaknesses	Opportunities	Threats
		Develop specialized LSPs for EE technologies and O&M practices by local industry	utilization
Export oriented units easy to accept the certification	Lack of implementation of lean manufacturing and TQM  Non enforcement of control measures in the production	Availability of natural gas as a clean fuel  Availability of improved quality of raw materials  Reduce energy cost through energy audits/energy services	Wide variation in price of raw material  Coal is being used as fuel

## 6.0 Conclusions

A questionnaire survey was conducted in the six clusters between September 2017 to January 2018, to get information about the services in the clusters with respect to each of the above categories and also to access the industry's perception of the need to develop these services within the clusters.

The exercise helped to analyse the demand side and supply side constraints with respect to local service providers in the six clusters. The summary of the demand side and supply side needs of local industries is presented in table 6.1.

**Table 6.1: Demand and supply side analysis of LSPs Morbi cluster**

S. No.	Area	LSPs	
		Demand side constraints	Supply side constraints
01	Good practices in motor rewinding	Lack of awareness among MSMEs on impact proper rewinding practices	No formal training courses available at the local level to provide training on electric motor rewinding practices
02	Retrofits & new EE/RE technologies	Low level of awareness among MSMEs on new EE/RE technologies and best operating practices. New equipment selected based on lowest capital costs instead of lifetime cost criteria.	Most of the LSPs are located in Rajkot and Ahmedabad
03	Best operating practices to save energy	Inadequate awareness among MSMEs about energy losses due to improper operating practices. Basic instruments to measure energy flows like meters/ gauges are not installed in the industries.	LSPs concentrate on selling new equipment rather than improving the operating practices if installed equipment.
04	Kiln (Burner, automation and waste heat recovery)	Poor of awareness about new EE burners, furnace automation and WHR options	Selection of kiln often based on lowest capital cost rather than on lifetime costs



# Annexures





## Annexure 1: Questionnaire 1: For collecting information of the LSPs from Ceramic MSMEs

### QUESTIONNAIRE / DETAILS

#### 1. Company background

- Name of the Company :
- Address :
- Contact Person :
- Mobile / Landline :
- Email ID :
- Product Manufactured :

#### 2. Local Service Providers (LSPs)

Section	Equipment/Service	LSPs
<b>Process Machinery</b>		
<b>Wet Grinding</b>	Ball Mill	
	Grinding Media	
<b>Spray Drying</b>	Spray Drier	
<b>Pressing</b>	Automatic Hydraulic Press	
<b>Drying</b>	Dryers	
<b>Firing and Baking</b>	Gas / Oil Fired Roller kilns	
	Burners	
	Insulation & Refractory	
	Waste heat recovery	
	Control & Instruments for Firing System	
<b>Tile Printing</b>	Ceramic Tiles Printing Machine	
<b>Sizing and Polishing</b>	Tiles Polishing	
	Tiles Sizing/Cutting Machine	
<b>Utilities</b>		
Induction Motor	Energy Efficient Motors (Distributors)	
	Motor Rewinding Services	
VFD (Variable Frequency Drives)	Suppliers	

Section	Equipment/Service	LSPs
Air Compressor	Air Compressor (servicing)	
	Auto Drain Valves/Air guns and Spares supplier	
	Air Piping	
Pumping	Energy Efficient slurry Pumps	
	AMC/Maintenance	
	Automation	
Fans & Blowers	Energy Efficient Fans	
	AMC/Maintenance	
	Automation	
Belt & Gear System	High-torque cog belts	
Bearing	Energy Efficient (E2) bearings	
Lighting	LED lamps	
Solar	PV Solar	
Energy Monitoring System		
Power factor	Consultants/capacitor suppliers	
Others		
<b>Other Services</b>		
<b>Support services</b>	Process experts/ consultants	
	Energy Audits	
	Lean Manufacturing	
	Environment consultants	
	ISO consultants	

3. Are there any areas where reliable local service providers are not available

## Annexure 2: Questionnaire 2: For collecting information about the type of services offered by the LSPs

Questionnaire for EE (Energy Efficiency) /RE (Renewable Energy) Service Providers

Morbi Ceramic cluster

### 1. General information

Name of the firm		
Nature of firm	Individual/sole proprietorship/Pvt. Limited/Limited/Partnership	
Year of establishment		
Name of the CEO/MD	Dr/Mr./Ms.	
Contact person(s) regional		
Mobile		
Email		
Mailing address		
Factory/H.O. address		
Number of employees	Technical:	Non-technical:

### 2. Categories of business/service (please tick one or more boxes)

Category	Technology/Service	Please specify
Energy Efficiency (EE)		
	EE Equipment Manufacturer	
	EE Material Manufacturer	
	EE Consultancy	
	EE Fabrication	
	EE O&M services	
	EE Others	
Renewable Energy (RE)		
	RE Equipment Manufacturer	
	RE Material Manufacturer	
	RE Consultancy	
	RE O&M services	
	RE Others	
Other services (Please specify)		

**3. Technology features, projects and clients** *(Please add additional sheets, if required)*

Technology/Service*	Features and benefits (e.g. key specification, saving (%), investment, payback period)	No. of implementations	Clients

\* Please attach technical brochure and detailed case studies, if available

**4. Any other information**

## Annexure 3: Sample survey questionnaires filled during the field surveys

### QUESTIONNAIRE / DETAILS

#### 1. Company background

- Name of the Company : Hexa Ceramic Pvt. Ltd
- Address : 8-A, National Highway, Near Nava Jambudiya Morbi-2
- Contact Person :Mr Dinesh Patel (Director)
- Mobile / Landline : 9825913635
- Email ID :hexaceramic@yahoo.com
- Product Manufactured :vitrified tiles

#### 2. Local Service Providers (LSPs)

Section	Equipment/Service	LSPs
<b>Process Machinery</b>		
<b>Wet Grinding</b>	Ball Mill	Shree Bhagwati Engineering Works Mr Ramesh-9826291779 Email id: info@bhagwati.com
	Grinding Media	Nil
<b>Spray Drying</b>	Spray Drier	P.M Industries & process equipments Ltd Mr Pravin-9890609531 Email id: pravin@pmindustriesindia.com
<b>Pressing</b>	Automatic Hydraulic Press	Sacmi Engineering (I) Pvt. Ltd Address: A101 - A104, Oreva Landmark, NH -8A, Trajpar Chowkdi, Morbi -363642 (Rajkot) Contact Person: Mr. Anand Pande +91-2822-241298/+91-9099906451 Email: india.sp@sacmi.in
<b>Drying</b>	Dryers	Nil
<b>Firing and Baking</b>	Gas / Oil Fired Roller kilns	Sharma Kiln Technologies, Mr.Adir Sharma-9327039235
	Burners	Nil
	Insulation & Refractory	Noble Refractories,

		Mr. Atanu Datta,Mr Tushar Dholaria 9825224661 Email id- info@noblerefractories.com
	Waste heat recovery	Nil
	Control & Instruments for Firing System	Nil
<b>Tile Printing</b>	Ceramic Tiles Printing Machine	Maruti Intelli Mech, 195/1, Ashima Complex, Near Tulsi Petrol pump, Behind Hitachi, Phone No. +91 2764 277677At:-Village. Karannagar, 382727District:Mehsana, (N.G)
<b>Sizing and Polishing</b>	Tiles Polishing	Nil
	Tiles Sizing/Cutting Machine	Nil
<b>Utilities</b>		
Induction Motor	Energy Efficient Motors (Distributors)	Parishram Technologies (Siemens Motors supplier) , Chirag Patel(9925487400) parishram_siemens@yahoo.co.in, Shivshakti Chambers, Shop no. 6 and 7, Lalpar, beh. SBI Bank, NH-8A, Morbi, parishram_siemens@yahoo.com
	Motor Rewinding Services	Nil
VFD (Variable Frequency Drives)	Suppliers	Nil
Air Compressor	Air Compressor (servicing)	Sai Diesels Pvt Ltd (Elgi Air compressors supplier) 01-FF, star Shopping Centre, 20, New Jagnath Plot, Doctor Yagnik Road, Rajkot-360001 Ashlesh Bhat (9327218100) ashjbhatt@saidieselsindia.com
	Auto Drain Valves/Air guns and Spares supplier	Nil
	Air Piping	Nil
Pumping	Energy Efficient slurry Pumps/Water Pumps	Nil
	AMC/Maintenance	Nil
	Automation	Nil
Fans & Blowers	Energy Efficient Fans	Nil

	AMC/Maintenance	Nil
	Automation	Nil
Belt & Gear System	High-torque cog belts	HASTI BELTING Mr. Nilesh Mehta Plot No-F-4, Shakti Chambers, Near Dariyalal Weigh Bridge, Morbi-Wankaner Road, Morbi, Gujarat, 363642, India +919377739065
Bearing	Energy Efficient (E2) bearings	Nil
Lighting	LED lamps	Nil
Solar	PV Solar	Aditya Power, Vir Shukla (9099055325), Near Aston Chowk, Rajkot, veershukla008@gmail.com
Energy Monitoring System		Nil
Power factor	Consultants/capacitor suppliers	Nil
Others		
<b>Other Services</b>		
<b>Support services</b>	Process experts/ consultants	Mr OPS Badal,Ceramics Consutant,Morbi, Contact No.:9825452708/9727054638,Email id: opsb_rk@yahoo.co.in/opsbrk@gmail.com
	Energy Audits	Nil
	Lean Manufacturing	Nil
	Environment consultants	Nil
	ISO consultants	Nil

3.Are there any areas where reliable local service providers are not available

**Morbi Ceramic cluster****1.General information**

Name of the firm	Parishram Technologies	
Nature of firm	sole proprietorship	
Year of establishment	2011	
Name of the CEO/MD	Mr.Chirag Patel	
Contact person(s) regional Mobile Email Mailing address	Mr. Chirag Patel 9925487400 Parishram_siemens@yahoo.co.in Shivshakti Chambers, Shop no. 6 and 7, Lalpar, beh. SBI Bank, NH- 8A, Morbi,	
Factory/H.O. address	Shivshakti Chambers, Shop no. 6 and 7, Lalpar, beh. SBI Bank, NH- 8A, Morbi,	
Number of employees	Technical: 2	Non-technical: 5

**2.Categories of business/service (please tick one or more boxes)**

Category	Technology/Service	Please specify
Energy Efficiency (EE)		
	EE Equipment Manufacturer/Supplier	IE2 and IE3 Motor Supplier of Siemens
	EE Material Manufacturer	
	EE Consultancy	
	EE Fabrication	
	EE O&M services	Yes
	EE Others	
Renewable Energy (RE)		
	RE Equipment Manufacturer	
	RE Material Manufacturer	
	RE Consultancy	
	RE O&M services	
	RE Others	
Other services (Please specify)		



**3. Technology features, projects and clients (Please add additional sheets, if required)**

Technology/Service*	Features and benefits (e.g. key specification, saving (%), investment, payback period)	No. of implementations	Clients
IE2 and IE3 motor supplier of Siemens	Upto 3 Years	50 Units	Capron Vitrified, Marvel Vitrified, Kishan Cold Storage

\* Please attach technical brochure and detailed case studies, if available

**4. Any other information**



## Questionnaire for EE (Energy Efficiency) /RE (Renewable Energy) Service Providers

**Morbi Ceramic cluster****1.General information**

Name of the firm	Sai Diesels Pvt Ltd	
Nature of firm	Pvt. Limited	
Year of establishment	2003	
Name of the CEO/MD	Mr.Ashles Bhatt	
Contact person(s) regional	Mr.Ashles Bhatt	
Mobile	9327218100	
Email	ashjbhatt@saidieselsindia.com	
Mailing address	01-FF,Star Shopping Centre,20 New Jagnath Plot,Dr. Yagnik Road, Rajkot-360001	
Factory/H.O. address	01-FF,Star Shopping Centre,20 New Jagnath Plot,Dr. Yagnik Road, Rajkot-360001	
Number of employees	Technical: 9	Non-technical: 6

**2.Categories of business/service (please tick one or more boxes)**

Category	Technology/Service	Please specify
Energy Efficiency (EE)		
	EE Equipment Manufacturer/Supplier	Elgi Compressor with VFD
	EE Material Manufacturer	
	EE Consultancy	
	EE Fabrication	
	EE O&M services	Yes
	EE Others	
Renewable Energy (RE)		
	RE Equipment Manufacturer	
	RE Material Manufacturer	
	RE Consultancy	
	RE O&M services	
	RE Others	
Other services (Please specify)		

**3. Technology features, projects and clients (Please add additional sheets, if required)**

Technology/Service*	Features and benefits (e.g. key specification, saving (%), investment, payback period)	No. of implementations	Clients
EE VFD screw compressor,	Less than 2 year	More than 900 Units	Varmora Tiles, Oasis Tiles, Max Granito, Verona Tiles

\* Please attach technical brochure and detailed case studies, if available

**4. Any other information**

## Questionnaire for EE (Energy Efficiency) /RE (Renewable Energy) Service Providers

**Morbi Ceramic cluster****1. General information**

Name of the firm	Ambit Energy Pvt Ltd	
Nature of firm	Pvt. Limited	
Year of establishment	2013	
Name of the CEO/MD	Mr. K.R Siddhapura	
Contact person(s) regional	V.B Doshi	
Mobile	9898007457	
Email	info@ambitenergy.in	
Mailing address	501,Ambit,1,Krishnoa Park Society, Pushkar Dham, Road-360001	
Factory/H.O. address	501,Ambit,1,Krishnoa Park Society, Pushkar Dham, Road-360001	
Number of employees	Technical: 5	Non-technical: 4

**2. Categories of business/service (please tick one or more boxes)**

Category	Technology/Service	Please specify
Energy Efficiency (EE)		
	EE Equipment Manufacturer	Waste Heat Recovery
	EE Material Manufacturer	
	EE Consultancy	Flue Gas analysis
	EE Fabrication	
	EE O&M services	
	EE Others	
Renewable Energy (RE)		
	RE Equipment Manufacturer	
	RE Material Manufacturer	
	RE Consultancy	
	RE O&M services	
	RE Others	PV Solar Projects
Other services (Please specify)		



**3. Technology features, projects and clients (Please add additional sheets, if required)**

Technology/Service*	Features and benefits (e.g. key specification, saving (%), investment, payback period)	No. of implementations	Clients
Fluegas Analysis and WasteHeat Recovery	Less than 2 years for WHR	13	Sumangal casting and Alox Technocast
PV solar Project	Less than 5 years	10	Vidhya Sagar Charitable Trust, and Sumangal Forging and castings

\* Please attach technical brochure and detailed case studies, if available

**4. Any other information**