

Comprehensive LSPs Mapping Report Thangadh Ceramic Cluster

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



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Abbreviations

APFC	Automatic Power Factor Controllers
BEE	Bureau of Energy Efficiency
DIC	District Industries Centre
DPR	Detailed Project Report
EE	Energy Efficiency
GEF	Global Environment Facility
LSP	Local Service Provider
MSME	Micro, Small & Medium Enterprises
PCAVT	Panchal Cermaic Association Vikas Trust
PV	Photovoltaic
RE	Renewable Energy
SWOT	Strengths, Weaknesses, Opportunities, and Threats
TERI	The Energy and Resources Institute
UNIDO	United Nations Industrial Development Organization
VFDs	Variable Frequency Drives
WHR	Waste Heat Recovery

1.0 Introduction

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 2nd August, 2017 for the following Ceramic and Foundry clusters on 26th September 2017.

Table 1.0: Focus sectors/ clusters awarded to TERI

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

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 Thangadh 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 Thangadh ceramic cluster.

2.0 Background of the cluster

2.1 General information

Thangadh is one of the large ceramic clusters located in Gujarat close to Morbi ceramic cluster. Thangadh is a Nagar Panchayat located in Chotila tehsil of Surendranagar district. It is located 22 km north of Chotila on District Road which further connects to Sara and Halvad in the north. The cluster is engaged in the production of sanitary wares. The basic raw material, fire clay, is locally available. Most of the wall and floor tile units established earlier in the cluster have now closed down but the sanitary-ware and refractory units are flourishing.

There are about 225 ceramic units operating in the cluster engaged in the production of sanitary-ware, refractory, wall tile and art tile.

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, casting/moulding, 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 2.3.

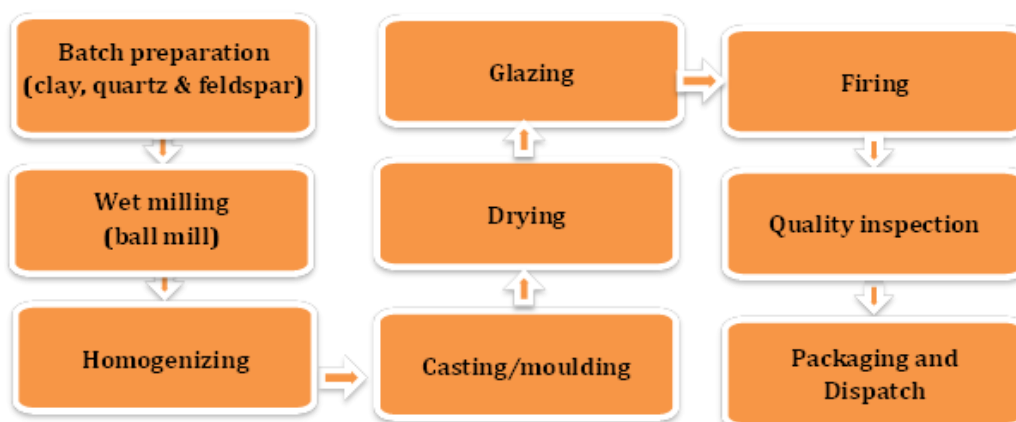


Figure 2.3: Manufacturing process of a typical ceramic unit

2.3 Major stakeholders

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 major industry association working for the development of the ceramic units in the cluster is Panchal Cermaic Association Vikas Trust (PCAVT). The industry associations are mainly involved in lobbying for local industry with various government agencies on various issues such as fuel and raw material supply. In addition the associations also organise various events such as seminars and workshops.

2.3.2 Training Institutions

There are no specialised training institutes for ceramic industry in Thangadh cluster. Lukhdhirji Engineering college in Morbi is particularly known for offering courses with specialization Diploma in Ceramic Technology. The ITI is located in the district place Surendranagar, Rajkot and Morbi

2.3.3 Government Support Institutions

There are relatively few government support institutes for ceramic industry in Thangadh cluster. The most of the institutions are located in the neighbouring districts like Surendranagar and Rajkot and in nearby Morbi ceramic cluster. Some of the major government supported institutions related to Ceramic industries in this region are the following:

- Government Polytechnic College, Rajkot
- Development Institute, Ministry of Micro, small and medium enterprises (MSME), Government of India
- District Industries Centrea (DICs) at Surendranagar and Rajkot under the Department of Industries and Commerce, Government of Gujarat

3.0 Methodology adopted

3.1 Identification and mapping of LSPs

Before the identification and mapping of the LSPs, the project undertook an 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 industry. The identification of the major equipment/ sections 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 cluster's needs was 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. 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 in the cluster.

A questionnaire survey of about 20 MSMEs and LSPs was done in the cluster. Some of the MSMEs and LSPs provided response as per the structured questionnaire while some provided feedback through a generic discussion with regard to the demand-supply requirements of services in the cluster. Sample survey questionnaires filled during the field survey 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 the 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 Thangadh cluster

Sr. No	Type of LSPs	Nos.
1	Process equipment – Grinding, drying, Kiln, Glazing/tile designing	25
2	LSPs – electrical utilities (motors, etc.)	11
3	LSPs - mechanical utilities	23
4	Renewable energy solutions	04
5	LSPs – technical /consultancy services	3
	Total	66

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
Process equipment	Wet Grinding	Ball Mill Grinding Media	Manufacture/ sales/ service
	Mould Preparation	Moulding	
	Firing and Baking	Gas/Oil Fired Kilns Burners Insulation & Refractory Waste heat recovery Control & Instruments for Firing system	

Category	Section	Equipment/service	Role of LSP
	Testing laboratory	Testing services	
Utility equipment	Electrical equipment	Voltage controllers, stabilizers, lighting, APFC etc. Electrical motors Motor rewinding Variable Frequency Drives	Manufacture/ sales/ service
	Mechanical	Air compressors, Air piping Compressed air system spares and accessories, auto-drain valve, EE Fans Slurry pumps, spares & service, High-torque Cog Belts	
other services	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 Coimbatore Foundry 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 Thangadh ceramic cluster

Sr. No.	Area	LSP	
		Demand side constraints	Supply side constraints
01	Motor rewinding practices	Lack of awareness about the benefits of improved electric motor rewinding on energy efficiency and electricity consumption	Low competence of service providers and maintenance operators on improved motor rewinding practices

Sr. No.	Area	LSP	
		Demand side constraints	Supply side constraints
02	EE/RE technologies	Lack of awareness among MSMEs and service providers on new EE/RE technologies related to low thermal mass material, VFDs, air Compressors, glazing machines, air guns, air amplifiers, solar energy etc.	Lack of local technical experts on EE/RE technologies. Most service providers are located in Rajkot, Ahmedabad and Vadodara, therefore, lack of day-to-day interaction. Follow-ups with service providers leads to time delays in project implementation.
03	Best operating practices	Lack of basic instrumentation like energy meters, pressure gauges, etc. make monitoring of performance and efficient operation of equipment like motors, air compressors and distribution networks, agitators, etc.	Competent trainers and training facilities not available in the cluster. There is a lack of reliable service providers with knowledge on energy savings due to improved operating practices.
04	Kilns – burners, automation, WHR etc.	Lack of awareness on energy efficiency improvements in kilns e.g. use of low thermal mass furniture, waste heat recovery system, insulation applications, energy efficient burners, combustion efficiency , fuel to air ratio, automation and so on	Service providers do not have full know-how/ expertise and only focus on low initial cost equipment

5.0 SWOT analysis of LSPs

A SWOT (Strengths, Weaknesses, Opportunities and Threats) analysis of LSPs in the cluster 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 of LSPs in Coimbatore cluster

Current situation		Future	
Strengths	Weaknesses	Opportunities	Threats
Service providers are keen to learn about new technologies and practices	Lack of training/exposure to latest EE/RE technologies and best operating practices	Industry association is active and keen to engage with service providers	Selection of new equipment based on lowest capital cost rather than life-cycle cost
Service providers are flexible and dynamic in nature	Technical representatives of large process machinery suppliers are not present in the cluster. Only sales representatives are available	Entrepreneurs are keen to implement new EE/RE technologies	MSMEs usually do not pay for soft technical support/services
LSPs cater to a diverse range of products/processes among MSMEs	No formal training institutions available at the cluster level	LSPs are willing to learn/acquire new skills	Presence of low cost service providers from China
LSPs can get good support from MSME staff due to the disciplined work culture prevailing in the cluster		Good scope to increase the level of automation	

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 analyze 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 tables 6.1.

Table 6.1. Demand and supply side analysis of LSPs Thangadh cluster

S. No.	Area	LSPs	
		Demand side constraints	Supply side constraints
01	Motor rewinding practices	Lack of awareness among MSMEs on impact of improper rewinding practices on energy efficiency	No formal training provided on electric motor rewinding to service providers
02	EE/RE technologies	Poor awareness among MSMEs on new EE/RE technologies and their benefits. New equipment selected based on lower capital costs	Most of the LSPs are located in Rajkot, Ahmedabad and Vadodara
03	Best operating practices	Lack of knowledge about energy wastages due to poor operating practices. Basic instruments to measure energy flows like meters/ gauges are not installed in MSMEs	LSPs are interested to sell new equipment rather than improving operating practices
04	Kilns – burners, automation, WHR etc.	Lack of awareness on EE burners, furnace automation and WHR options	Selection often based on lowest capital cost rather than operating costs

Annexures

Annexure 1: Questionnaire 1: For collecting information of the LSPs from foundry 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
Process Machinery		
Wet Grinding	Ball Mill	
	Grinding Media	
Mould preparation	Moulding	
Firing and Baking	Gas / Oil Fired Tunnel kilns	
	Burners	
	Insulation & Refractory	
	Waste heat recovery	
	Control & Instruments for Firing System	
Utilities		
Induction Motor	Energy Efficient Motors (Distributors)	
	Motor Rewinding Services	
VFD (Variable Frequency Drives)	Suppliers	
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	
Belt & Gear System	High-torque cog belts	
Lighting	LED lamps	
Solar	PV Solar	
Energy Monitoring System		
Power factor	Consultants/capacitor suppliers	
Others		
Other Services		
Support services	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

Thangadh 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 : Sunrise pottery works
- Address : P.O Box No.51, Amrapar, Thangadh-363530
- Contact Person : Mr Ravi Maru (Partner)
- Mobile / Landline : +918898089169
- Email ID : ssspwc ceramics@gmail.com
- Product Manufactured : Sanitary wares and ceramic products

2. Local Service Providers (LSPs) :

Section	Equipment/Service	LSPs
Process Machinery		
Wet Grinding	Ball Mill	Modena Technology India Pvt Ltd Address: A 206, Oreva Landmark, NH -8A, Trajpar Chowkdi, Morbi -363642 (Rajkot) Contact no: 02822-240008/ 9825548105 Contact Person: Mr Kamal kumar Email: modenaindia@gmail.com Contact: +91-2822-240008/ +91-9825548105
	Grinding Media	Nil
Mould preparation	Moulding	Dashrath Moulding art, Thangadh, Mr. Sureshbhai L Jagani 9825432119
Firing and Baking	Gas / Oil Fired Tunnel kilns	Sharma Kiln Technologies, Adir sharma(9327039235), 7/19 Bhagvat Vidyapith Road, Sola, Ahemadabad: 380060, sharmakiln@gmail.com
	Burners	Wesman Burners, Tushar Shah (9375003132/9427048715), A-442, Sakar VII, Nehru Bridge Corner, Ashram Road, Ahm- 380009, tushar.shah@wesman.com
	Insulation & Refractory	Jasdan Refractories, Jasdan, Pragnesh Patel

		Contact:9825222855 No:email id: info@jasdanrefractories.in
	Waste heat recovery	Nil
	Control & Instruments for Firing System	Nil
Utilities		
Induction Motor	Energy Efficient Motors (Distributors)	Premier Phasetrack Pvt Ltd, Tushar Patel(9824284009), 2. Bhaktinagar Station Road, Rajkot-360002, tushar_pppl@hotmail.com/Mr. Milan pandya 9904301453/Mr. Piyush Thaker(Siemens Area Manager) 9909904993 piyush.thaker@siemens.com
	Motor Rewinding Services	Yusuf Electric (Rewinding work of Siemens),Rajkot,Abbasbhai 9377397320
VFD (Variable Frequency Drives)	Suppliers	Nil
Air Compressor	Air Compressor (servicing)	Milestone Pnuematics Ahemdabad,ELGI Mr. Manan, Contact .9904805701 Email Id: manan@milestonepneumatic.com Mr Jogesh Patel ,Elgi Equipments ltd 9724326706,pateljp@elgi.com
	Auto Drain Valves/Air guns and Spares supplier	D-Vinci Enterprise, , 343, Jay Khodiyar Chambers, Rajpurpara Main Road, Rajkot-36001,Nikunj Chauhan (8460126586), dvincienterprise@gmail.com
	Air Piping	Avadhesh Agencies,Anand bhai(9824094945), 13 Vijay Plot, Oppo Dharti Honda, Gondal Road, Rajkot-360002,Aalap Barai,9904000008, bmburai@hotmail.com
Pumping	Energy Efficient slurry Pumps	Nil
	AMC/Maintenance	
	Automation	
Fans & Blowers	Energy Efficient Fans	Atomberg Technologies Pvt Ltd (BLDC Fans),

		Rohit Sharma(9980993600), M 101, Blues,Parshwanath Atlantis Park, Sughad 382424, Ahmedabad, rohitsharma@atomberg.com
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
Lighting	LED lamps	Green Energy Solutions , Kalpesh Patel, 8141188188, Rajkot, gbulbindia@yahoo.com
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		
Other Services		
Support services	Process experts/ consultants	Mr.Jha ,Ceramics plant Production & Quality Consultant. Thangadh,Contact No.9925166198, email id: lkjha1234@gmail.com
	Energy Audits	Nil
	Lean Manufacturing	Nil
	Environment consultants	Darshan Institute of Engineering & Technology ,Rajkot Mr.Nilay Sudhani Contact no. 9978917732 email id: aditya04patel@gmail.com
	ISO consultants	Nil

**Questionnaire for EE (Energy Efficiency) /RE (Renewable Energy) Service Providers
(Carrying out Capacity Building of LSPs: GEF-UNIDO-BEE Project)**

Thangadh Ceramic cluster

1.General information

Name of the firm	Premier Phasetrack Pvt. Ltd	
Nature of firm	Pvt. Limited	
Year of establishment	1969	
Name of the CEO/MD	Dr/Mr./Ms.Tushar B.Patel	
Contact person(s) regional	Tushar B.Patel	
Mobile	9824284009	
Email	Tushar_pppl@hotmail.com	
Mailing address	2,Bhaktinagar Station Road,Rajkot-360002	
Factory/H.O. address	2,Bhaktinagar Station Road,Rajkot-360002	
Number of employees	Technical: 2	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/Supplier	Siemens Motor(IE2 IE3and IE4),Switchgears
	EE Material Manufacturer	
	EE Consultancy	
	EE Fabrication	
	EE O&M services	
	EE Others	Rewinding at Siemens authorised service center
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,IE3 and IE4 Siemens Motors	Less than 3 Years	More than 30	Indian Rayon,Tata Chemicals,Ultratech cements, Mahindra gears

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

4.Any other information

**Questionnaire for EE (Energy Efficiency) /RE (Renewable Energy) Service Providers
(Carrying out Capacity Building of LSPs: GEF-UNIDO-BEE Project)**

Thangadh Ceramic cluster

1. General information

Name of the firm	Avadesh Agencies	
Nature of firm	Partnership	
Year of establishment	1989	
Name of the CEO/MD	Dr/Mr.Bharat M Barai	
Contact person(s) regional	Anand Bhinde	
Mobile	9824094945	
Email	bambarai@hotmail.com	
Mailing address	13-Vijay plot,Opposite –Dharti Honda,Gondal Road,Rajkot-360002	
Factory/H.O. address	13-Vijay plot,Opposite –Dharti Honda,Gondal Road,Rajkot-360002	
Number of employees	Technical: 2	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	Pneumatic air piping, EE air guns ,Pneumatic Tools and Accessories
	EE Material Manufacturer	
	EE Consultancy	
	EE Fabrication	
	EE O&M services	Yes provide maintenance 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
Pneumatic air piping, EE air guns, pneumatic tools and accessories (CP)	Less than 3 years	More than 200	Radhe Renewables, Redren Solar, Jyoti CNC, Rajan Technocast, Delta Technocast, Ashok Leyland Workshops, Jaiganesh Workshop, Perfect auto workshop.

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

4. Any other information

**Questionnaire for EE (Energy Efficiency) /RE (Renewable Energy) Service Providers
(Carrying out Capacity Building of LSPs: GEF-UNIDO-BEE Project)**

Thangadh Ceramic cluster

1.General information

Name of the firm	Global Airtech Systems (Atlas Copco)	
Nature of firm	Partnership	
Year of establishment	2002	
Name of the CEO/MD	Dr/Mr. Rajiv Shah	
Contact person(s) regional	Archit Shah	
Mobile	9925152791	
Email	archit.shah@globalairtechsystems.com info@globalairtechsystems.com	
Mailing address	219,Akshar Arcade,Opp.Memco Fire Station,Near Vijay Char Rasta, Navrangpura,Ahmedabad-380017	
Factory/H.O. address	219,Akshar Arcade,Opp.Memco Fire Station,Near Vijay Char Rasta, Navrangpura,Ahmedabad-380017	
Number of employees	Technical: 26	Non-technical:6

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

Category	Technology/Service	Please specify
Energy Efficiency (EE)		
	EEquipment Manufacturer/Supplier	Atlas copco air compressor supplier and Air piping
	EE Material Manufacturer	
	EE Consultancy	
	EE Fabrication	
	EE O&M services	Provide spares and maintenance services for air compressors and Air piping
	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
Air compressor	Fixed Speed VSD + (Specialized IPM Motor) 97% efficiency, Fiber resin Light weight fan, Based on Artificial Intelligence(Smart Link)-GPS system 60% size reduces to traditional compressor, Lowest power consumption 35% average savings Payback 6 months	More than 2000+	Antique ceramics Choice sanitaryware, Euro Anchor, Mangal deep ceramics, New light ceramics, Marvel Ceramics, Kiran refractories, Pankaj Ceramics, Reliance Ceramics, South Asian Ceramics, Rajdeep Ceramics, Sintel Cera.
Airnet Aluminium Piping	0% Leakage, 10 Years Guarantee on no air leakage, No Corrosion, No welding, No Threads, Just Pushfit. 2 years Payback.	20	Siyaram Granito, Calderys, Ikka Granito

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

4. Any other information