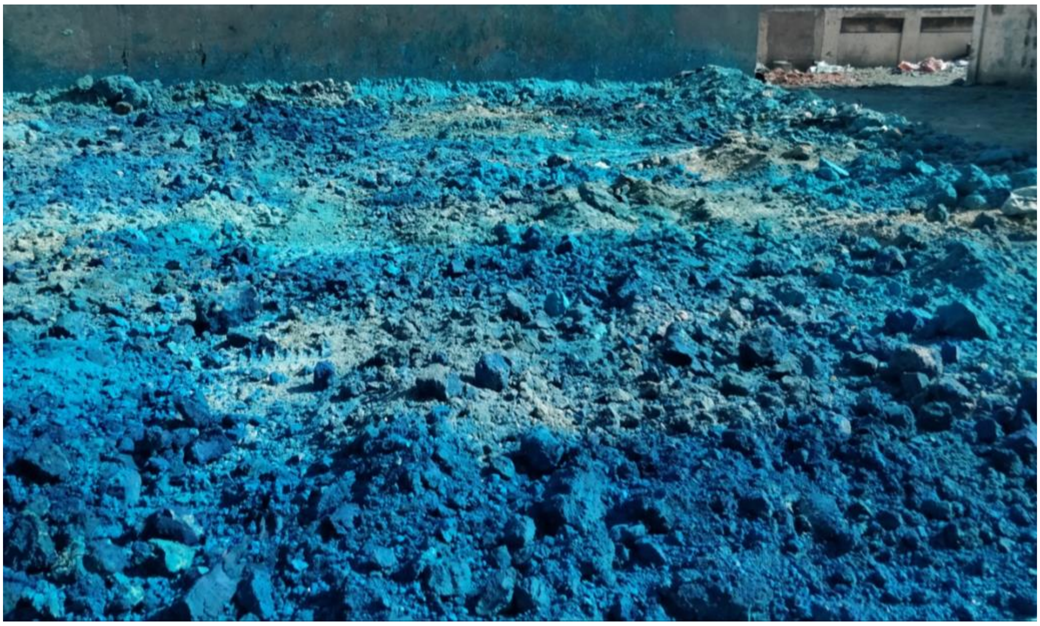
Preliminary Study Report on Ankleshwar Chemical Cluster

From field visit during the period of 7th May to 8th May and with inputs from EESL



Prepared By:

Project Management Unit

United Nations Industrial Development Organisation

Promoting Market Transformation for Energy Efficiency in MSMEs

UNITED NATIONS
INDUSTRIAL DEVELOPMENT ORGANIZATION

1. Contents

1.0 BACKGROUND

The project on Market Transformation of Energy Efficiency in MSMEs focuses on improving energy efficiency in the MSME industrial sector of India via demonstration of promising technology as well as an innovative financial model through continued capacity building, information dissemination, and establishment of standard operating procedures for implementing energy efficiency (EE) investment projects. The major stakeholders in this project are UNIDO, MoMSME, EESL, BEE & SIDBI.

10 MSME clusters are selected for implementing under the project. The 10 clusters are as follows:

SN	Cluster	Location (State)
1.	Textiles	Surat (Gujarat)
2.	Chemical	Ankleshwar (Gujarat)
3.	Tea	Jorhat (Assam)
4	Galvanizing and Wire drawing	Howrah (West Bengal)
5.	Paper	Muzaffarnagar (Uttar Pradesh)
6.	Forging	Batala, Jalandhar and Ludhiana (Punjab)
7.	Textiles	Varanasi (Uttar Pradesh)
8.	Sponge Iron	Sundargarh (Odisha)
9.	Rice	Vellore (Andhra Pradesh)
10.	Ceramic	East and West Godavari (Andhra Pradesh)

2.0 CLUSTER PROFILE

2.1 Ankleshwar Chemical Cluster, Gujarat

Ankleshwar is an industrial town located in the Bharuch district of Gujarat. The population of the town is approximately 150,000 most of which is directly or indirectly related to the chemical industry. The Ankleshwar Industrial Estate was set up by the Gujarat Industrial Development Corporation (GIDC) in the 1970s. The industrial estate, which is spread over an area of 1,600 hectares has close proximity to National Highway 8 (NH 8) and Delhi– Mumbai Railway Line. The industrial estate has more than 1,200 industries manufacturing diverse range of chemicals, pesticides, pharmaceuticals, bulk drugs, petroleum products, engineering, textiles, plastics, rubber, and packaging. Of these 1,200 units more than 600 are MSME units manufacturing various types of chemicals, like dyes, pigments, insecticides, specialty chemicals, petrochemicals, pharmaceuticals, and paints.

The industrial estate in Ankleshwar has more than 1,200 industries manufacturing diverse range of chemicals, pesticides, pharmaceuticals, bulk drugs, petroleum products, engineering, textiles, plastics, rubber, and packaging. Of these 1,200 units more than 600 are MSME units manufacturing various types of chemicals, like dyes, pigments, insecticides, specialty chemicals, petrochemicals, pharmaceuticals, and paints.

The state of Gujarat is a major contributor in the production of basic chemicals as well as petrochemicals with 54% and 59% as compared to the production in other parts of India, respectively. Also, chemicals/petrochemicals and pharmaceutical sectors contribute about 60% in the entire manufacturing output of Gujarat. Other major Indian states producing various chemicals include Maharashtra, Tamil Nadu, and Uttar Pradesh. About 50% of the total chemical production in Gujarat is contributed by industries in Ankleshwar making it the most significant chemical cluster of Gujarat and India.

Fig: Process Unit in a Chemical Industry

The industrial estate in Ankleshwar has more than 1,200 industries manufacturing diverse range of chemicals, pesticides, pharmaceuticals, bulk drugs, petroleum products, engineering, textiles, plastics, rubber, and packaging. Of these 1,200 units more than 600 are MSME units manufacturing various types of chemicals, like dyes, pigments, insecticides, specialty chemicals, petrochemicals, pharmaceuticals, and paints.

2.2 Kick-off meeting

For briefing about the project to the identified cluster and understanding the present status of the clusters. A joint team of DC MSME office, UNIDO & EESL visited the five newly proposed clusters and Ankleshwar chemical cluster field visit was carried out during the period of 7th to 8th May 2018. This Cluster Level Interaction was done for chemical Industries Association Members in Ankleshwar, Gujarat which was organised on 07th May, 2018 at Ankleshwar Industries Association Office, Gujarat with all the main members of Chemical association followed by industries visits. (Few Photographs are attached as Annexure A). In this kick-off meeting the main framework of the project was elaborated to the participating members and discussion was held as to what is the present status of energy efficiency and what are the various potential EE technologies that the industries themselves feel that would change their bottom line for making them more productive and energy efficient. Following issues and challenges were discussed in the meeting.

2.2.1 Technology issues:

The use of conventionally designed/obsolete technologies and out-dated operating practices are the major challenges in the cluster. Lack of awareness of EE technologies, weak linkages with suppliers and low levels of knowledge of local fabricators on modern technologies are the major bottlenecks hindering technology upgradation in the cluster.

2.2.2 Energy Issues:

Interactions with the industry stakeholders revealed that there is no shortage of electricity or natural gas supply to the cluster, in fact Gujarat boasts of a power surplus state. But, the major challenge is the staggering rise in the price of primary source of energy, i.e. natural gas. It has become increasingly difficult for the chemical units to obtain gas at quota prices. As a result, some of the micro and small scale units have shifted to firewood for their heating process requirements, which is not an eco-friendly option

2.2.3 Manpower Issues:

There is an acute shortage of skilled manpower in the cluster and also resistance among the workers to work in chemical units due to their polluted nature. Also, transmission of intermediate product is mostly done manually in small units, which is increasing the dependence upon scarce human resources.

2.2.4 Environmental Issues:

The major challenge in front of the chemical units of Ankleshwar is to control their effluent discharge and pollution. The Ankleshwar chemical cluster was declared critically polluted ‘among 42 other clusters in India by MoEF, GoI. MoEF has induced the cluster units to invest in technologies for their effluent treatment. It keeps a check on the pollution levels of Ankleshwar and operates through GPCB. Because of the critically polluted status, GPCB has not been granting clearances to some companies to expand their production or to run some of their existing facilities.

3.0 MANUFACTURING PROCESS AND PRODUCTS

Chemical industries in Ankleshwar manufacture diverse range of products like dyes and dye intermediates, pigments, pesticides/insecticides, petrochemicals, agrochemicals, chlor-alkali, pharmaceuticals, paints, etc.

4.0 RAW MATERIAL

A lot of basic chemicals are used as raw materials to manufacture major chemical products like dyes and dye intermediates, pigments, pesticides, petrochemicals, and so on. These basic chemicals used as raw materials are classified according to a variety of features: their chemical composition (organic and inorganic), their origin (mineral, vegetative, and animal), and their state of aggregation (solid, liquid, and gaseous).

Mineral raw materials are divided into ore (metallic), non-metallic, and combustible (organic). Ore minerals primarily comprise metal oxides and sulphides (Cu_2S, CuS, Fe_2O_3, Fe_3O_4, ZnS, and so on). It also includes SiO_2, Al_2O_3, CaO, and MgO.

Non-metallic mineral raw materials used are diverse in their chemical composition and are used either in their natural state (sand, clay, asbestos, and mica) or are delivered for chemical processing (chloride, phosphates, sulphates, carbonates, and alumina silicates). Vegetative and animal raw materials include wood, cotton, oils and fats, milk, hides, and wool. They are processed either into food products (food raw materials) or into products for domestic and industrial use. Cheap and easily available raw materials, such as water and air are also widely used by the chemical industries.

5.0 FUEL USED

These units use both thermal and electrical forms of energy to fuel their processes. The various sources of energy include:

- Piped Natural Gas
- Electricity
- Bio Mass
- LDO, HSD (used rarely, only for DG sets)
- Coal (in few units)

a) Thermal Energy

Thermal energy in the form of steam/hot air is utilized to attain the process parameters of chemical reaction and for treatment/processing/drying of the final products. The energy sources utilized in the cluster for supplying thermal energy are Piped Natural Gas (PNG) and firewood. These thermal sources of energy are used to operate utilities like steam boiler, thermic fluid heater, hot air generator, and other heating utilities.

Gujarat Gas Company Ltd (GGCL) is a gas transmission and distribution company operating in the industrial hub of South Gujarat. It distributes gas to domestic, commercial, and industrial consumers in Ankleshwar.

b) Electrical Energy

Electricity is primarily used in the electric motors to run utilities like agitator systems of reaction vessels, centrifuge, gas/air/liquid air circulation pumps, chilling plants, and air compressors. Electricity in Ankleshwar and Panoli industrial estates is supplied by Dakshin Gujarat Vij Company Ltd (DGVCL)

6.0 MANUFACTURING PROCESS

The manufacturing process of the chemical industries varies depending on the type of products being manufactured by them. The manufacturing process of a typical chemical manufacturing unit along with the utilities and the energy sources is shown below.

a) Dissolving/Mixing: In the first step, raw materials in desired proportion by weights are poured into a reaction vessel. Then the mixture is continuously stirred, and the temperature is increased or decreased as per the specific product requirement through jacket heating or jacket cooling. Process time of this step depends upon the specific milestone of the process, such as achieving certain temperature range or concentration of intermediate product. This process requires both thermal energy as well as electric energy. Generally, heat is supplied to this process through natural gas or wood based thermic fluid heater/boiler. Electricity is utilized in the process for continuously stirring of mixture.

b) Primary filtration in Centrifuge: In this process, the intermediate product, which can be liquid or suspended solid particles, is separated from the slurry. Filtration is generally done using centrifuge or filter press. The centrifuge works using the sedimentation principle, where the centripetal acceleration causes denser substances to separate along the radial direction, whereas, in the filter press separation of solid part and liquid chemicals is done through pressing of the content in filter plates using hydraulic press. During this process solid intermediate is separated out from the liquid part. This process usually takes 1–2 hours. This process requires electric energy to run the electric motors.

c) Purification: In this process, the basic properties of the intermediate product are improved or modified as per the requirement of the final product. For example, if the intermediate product is alkaline in nature, in order to neutralize it, sulphuric acid is added during the process and certain temperature parameters are maintained. In this process, temperature of the mixture is maintained using jacket cooling/heating and it is continuously stirred using the agitator system. This process requires both thermal energy as well as electric energy. Generally, heat is supplied to this process through natural gas-or wood-based thermic fluid heater/boiler. Electricity is utilized in the process for continuously stirring of mixture.

d) Secondary filtration: In this process, the intermediate product, which can be liquid or the suspended solid particles, is separated from the slurry. Filtration is generally done using centrifuge or filter press. This process also takes 1–2 hours like primary filtration and also requires electric energy to run the electric motors.

e) Drying: This process is generally applicable for organic chemical product where final state of the product is powder. In this process, the cakes received from filtration process are loaded into tray/spin flash dryers. In the dryer, cakes of the chemical are dried through moisture removal using hot air. This is the most time-consuming step of the chemical manufacturing process and normally takes 20–36 hours per batch. Hot air is used for drying the cake in the dryer and is supplied by natural gas or wood-fired hot air generator.

f) Grinding/Crushing (Pulverization): Granules/blocks of dried products are transferred to the pulverizer for crushing it to the required size particles of the final product. Electric motor drives the process, which takes about 3–5 hours for pulverizing one batch of the final product.

g) Packaging: In this step, the final product, the chemical, in the form of powder or liquid is packaged properly for dispatch.

7.0 FIELD STUDY

Following representative industries Visited were visited in consultation witthe local industrial association by the joint team of DI MSME office, EESL and UNIDO during the period of 07/05/2018 to 08/05/2018:

1. Mayur Associates (Dyes & Chemicals), Ankleshwar
2. Pragna Dyechem Pvt. Ltd., Ankleshwar
3. Dynemic Products Ltd, Ankleshwar.
4. Hemani Industries Limited, Ankleshwar
5. Shree Sulprhranics Chemicals, Ankleshwar.
6. Apex Health Care, Ankleshwar
7. Suyog Dyechem Ltd, Ankleshwar.

Note: duly filled questionnaires and few photographs are attached as annexure A

8.0 Observations:

During the visits to above industries, it has been noticed that all are using similar kind of loads with different specifications for the end product manufacturing. The major loads observed as follows.

1. Steam boilers
2. Thermic fluid heaters
3. Reaction vessels
4. Hot air generators
5. Air compressors
6. Dryers
7. Circulation pumps
8. Chilling system
9. Electric motors

9.0 PROSPECTIVE TECHNOLOGIES

Few prospective technologies are elaborated below:

9.1 Boilers with Energy-Efficient Burners

The purpose of the burner is to mix molecules of fuel with molecules of air. A boiler will run only as well as the burner performs. A poorly designed boiler with an efficient burner may perform better than a well-designed boiler with a poor burner. Burners are designed to maximize combustion efficiency while minimizing the release of emissions. A power burner mechanically mixes fuel and combustion air and injects the mixture into the combustion chamber. All power burners essentially provide complete combustion while maintaining flame stabilization over a range of firing rates. Different burners, however, require different amounts of excess air and have different turndown ratios. The turndown ratio is the maximum inlet fuel or firing rate divided by the minimum firing rate. An efficient natural gas burner requires only 2% to 3% excess oxygen, or 10% to 15% excess air in the flue gas, to burn fuel without forming excessive carbon monoxide. Most gas burners exhibit turndown ratios of 10:1 or 12:1 with little or no loss in combustion efficiency. Some burners offer turndowns of 20:1 on oil and up to 35:1 on gas. A higher turndown ratio reduces burner starts, provides better load control, saves wear-and-tear on the burner, reduces refractory wear, reduces purge-air requirements, and provides fuel savings.

9.2 Efficient Burner Technologies

An efficient burner provides the proper air-to-fuel mixture throughout the full range of firing rates, without constant adjustment. Many burners with complex linkage designs do not hold their air-to-fuel settings over time. Often, they are adjusted to provide high excess air levels to compensate for inconsistencies in the burner performance.

An alternative to complex linkage designs, modern burners are increasingly using servomotors with parallel positioning to independently control the quantities of fuel and air delivered to the burner head. Controls without linkage allow for easy tune-ups and minor adjustments, while eliminating hysteresis, or lack of retraceability, and provide accurate point-to-point control. These controls provide consistent performance and repeatability as the burner adjusts to different firing rates.

Alternatives to electronic controls are burners with a single drive or jackshaft. Avoid purchasing standard burners that make use of linkages to provide single-point or proportional control. Linkage joints wear and rod-set screws can loosen, allowing slippage, the provision of sub-optimal air-to-fuel ratios, and efficiency declines.

Consider purchasing a new energy-efficient burner if your existing burner is cycling on and off rapidly. Rotary-cup oil burners that have been converted to natural gas use are often inefficient. Determining the potential energy saved by replacing your existing burner with an energy efficient burner requires several steps. First, complete recommended burner-maintenance requirements and tune your boiler. Conduct combustion efficiency tests at full- and part-load firing rates. Then, compare the measured efficiency values with the performance of the new burner. Most manufacturers will provide guaranteed excess O2, CO, and NOx levels.

Even a small improvement in burner efficiency can provide significant savings. Consider a 50,000 pound per hour process boiler with a combustion efficiency of 79% (E1).

9.3 Horizontal Three Pass Thermic Fluid Heater

The DELTAPAC series, horizontal three pass thermic fluid/thermal oil heater is designed for maximum efficiency using a variety of liquid and gaseous fuels. It is designed with fuel flexibility in mind and can fire a range of heavy oils, light oils and gases. It allows high process temperatures with low operating pressures.

PRODUCTS FEATURES:	- High capacity heating system - Multi-fuel option - heavy oils, light oils and gases - Rugged - requires very little maintenance

Capacities	From 0.1 million kcal/hr to 10.0 million kcal/hr
Temperature:	Up to 350°C
Firing fuels:	Heavy oils, light oils and gases
Efficiency:	Overall efficiency of 85 % (+/-2%) on NCV

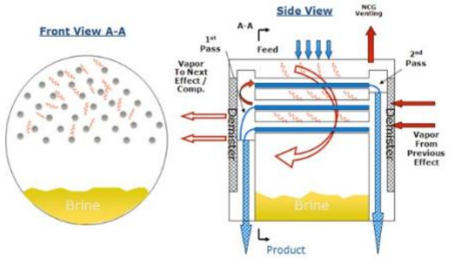
9.4 Hot Gas Generator

The AIRPOWER series, horizontal single pass direct fired shell and shell type hot gas generator designed for maximum efficiency using a variety of liquid and gaseous fuels. It is designed with fuel flexibility in mind and can fire a range of heavy oils, light oils and gases. It allows high and medium process temperatures without operating pressures

PRODUCTS FEATURES:
- High capacity heating system
- Multi-fuel option – heavy oils, light oils and gases
- Rugged - requires very little maintenance
- User-friendly systems.

9.5 Mechanical Vapour Compression (MVC/MVR)

Mechanical vapour compression (MVC) or mechanical vapour recompression (MVR) reduces vapour consumption, replaced by a source of electrical energy, resulting in a very low operating cost compared to a multiple effect operation.



The vapour produced by the evaporator is sent to a MVC installation, to be compressed and heated up.

It is then resent to the evaporator to the outside of the tubes to be used as a heating steam. In this process, the evaporator is also used as the condenser for the vapour evaporation.

The main advantage of the Mechanical Vapour Compression technology is its low operating costs.

Energy consumption per tonne of evaporated water:

- MVC: ~ 15 kW.h / hr electric
- Single effect: ~ 630 kW thermal
- Triple effect: ~ 230 kW thermal
- Six fold effect: ~ 115 kW thermal

- Vapour consumption almost zero
- Low consumption of cooling water
- More compact layout, compared to a multiple effect evaporator (a MVC evaporator is composed of a single evaporation body and a compressor)

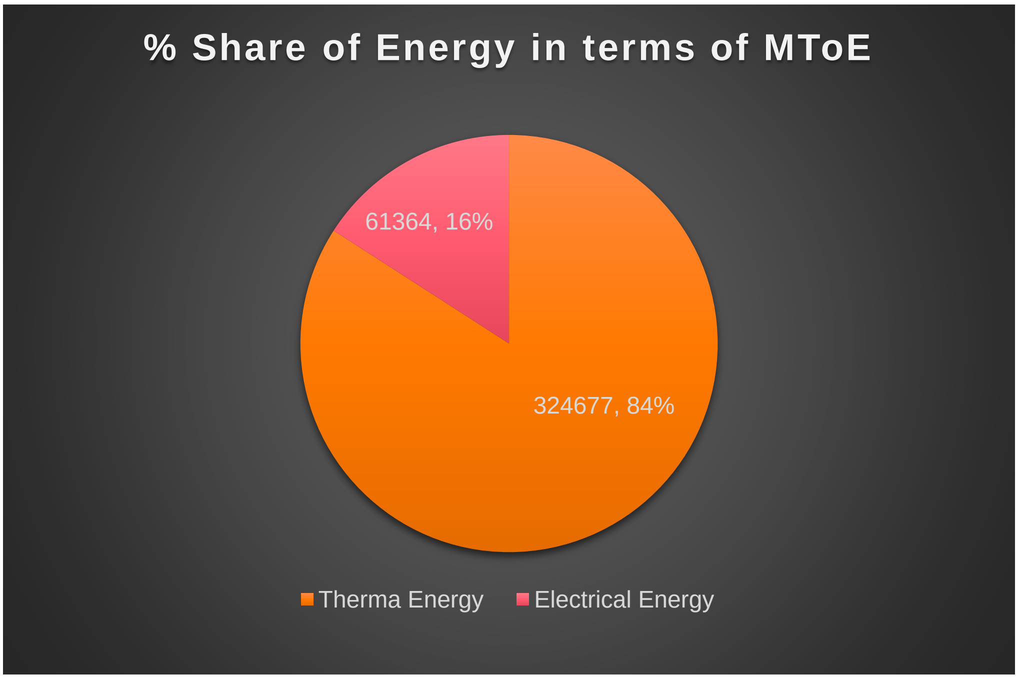
The compressor is driven by a frequency inverter, which enables the implementation capacity to be finely and quickly adjusted from 30% to 100% of the maximum capacity.The MVC/MVR technology makes it possible for several compressors to be used in series in order to respond to constraints (significant boiling delay, decrease in exchange surface, etc). If properly sized and installed, MVC/MVR processes are very reliable. We have been using this technology for over 20 years, maintenance costs are extremely low on the compressors we use.

10.0 CONCLUSION

It is mainly observed that various small and high-rating electric motors are used in almost all applications of the chemical units of Ankleshwar. Most of these motors are used in equipment like agitator, pumps, fans, centrifuge, dryer among other applications. In every industries motors are the major load for electrical energy consumption. Average in every industry approximately 200 motors were installed ranging between 5 HP to 150 HP. Also, it is also observed that 95% of the existing motors are very old and less than IE1.

Coming to other Energy Efficient technologies like Boilers, Thermopacks, Hot Air Generators, Mechanical Vapour Recompression (MVR) etc. can also be a possible retrofit option. However, for which better clarity will be ensured after the detailed energy audits.

Total annual energy consumption of chemical manufacturing units in Ankleshwar is estimated to be about 408,423 tonnes of oil equivalent (toe) as per data gathered from various sources for 2010–11. From the discussions with the industries members and previous reports of various Govt. Institutes it is noticed that the overall thermal energy consumption in the Ankleshwar Chemicals is estimated to be 3.0 Lacks plus ToE/Annum and also at the same time electrical energy is also estimated to be 65 K ToE/Annum.



The energy costs are 10% to 15% of the manufacturing costs for Ankleshwar chemicals. Industries.

Ankleshwar is a chemical cluster in Gujarat. It has over 700 MSMEs manufacturing various kinds of chemicals (dyes and pigments—67%; pharma and pharma intermediates—27%; and pesticides and chlor-alkalis—6%). The production capacity of these units varies from 50 tones to over 10,000 tones per annum (tpa). After the visit of representative industries, it was found that following are the major technologies that are applicable to the cluster

1. Energy efficient chilling plants
2. Energy efficient cooling system
3. Energy efficient compressors (replacement of reciprocating compressors by screw compressors
4. Energy efficient boilers and thermic fluid heaters
5. Putting capacitors banks for power factor improvement

Overall, the adoption of energy-efficient technologies and the best operating practices can lead to significant energy savings in the chemical units. However, saving potential will vary from unit to unit. The units in the cluster primarily use locally fabricated technologies especially for thermal and process equipment, which are conventionally designed and inefficient. The electrical motors are rewound multiple times and mechanical conditions of these motors are also poor. Initial observations from the units visited provide a substantial estimate of energy saving potential. Some of the energy conservation measures having significant saving potential and replication potential in chemical cluster are mentioned below.

1. Steam generation and distribution system
    - Fuel switchover
    - Fuel to air ratio optimization o Improvement in insulation
    - Condensate recovery
    - Waste heat recovery
2. Thermic fluid heater
    - Automation with VFD and temperature control mechanism
3. Hot air generator o Fuel switchover
    - Fuel to air ratio optimization
    - Improvement in insulation
    - Hot air distribution and circulation system at utilization end (hot air chambers)
    - Improved drying system
4. Compressed air system
    - Leakage reduction
    - Improvement in operating practices
    - Upgrade in existing technology (reciprocating to screw)
5. Reaction vessels and process
    - Replacement of belt driven horizontal agitator by direct drive vertical agitator
    - Two-way valve with temperature control mechanism for heating and cooling process
    - Improvement in insulation system in vessels using jacket heating/cooling
    - Installation of electrical chiller machine to eliminate the use of ice-based chilling system
    - Application of VFD in centrifuge and ball mills
6. Electrical distribution system o
    - Improvement in billing power factor to avoid the excess demand as well as penalty from utility board
    - Load management
7. Other areas
    - Rewound and old electrical motors may be replaced by EEF-1 category motor
    - Improvement in pumping system
    - se of energy-efficient lighting systems
    - Use of cogged type poly V belt

It is recommended that detailed energy audits be conducted in the cluster to assess the exact scope and feasibility of these technologies in view of the need for the aggregation of the demand and the how easy it would be to get the returns on investments.

11.0 ANNEXURE

Suyog Dyechem Limited

Scoping study of Ankleshwar Chemical Industries for UNIDO MSME GEF-5 Project

A. DETAILS OF THE UNIT/ FACTORY

1	Name and contact address	Suyog Dye-chem. 24/U/4305 Nikeri Taluka
3	Type of Products	Reactive, Dyes, Direct Dye & Pigment & CPC (intermediate) (all blue color).
4	Total Yearly Production capacity in Tons/Pieces	250 Ton/month. Currently producing at 100 Ton/month
5	Total Contracted demand of electrical load (KVA) for the factory excluding domestic use	800 KVA, Rs 13.50 lakhs. MD – 554, PF – 0.36%
6	Total capacity of generator set (KVA) /own generation	2, 320, ×360.
7	Demand of Gas or Coal per month	Rs 20 - 25 lakh.
9	Contact person with phone no. and email ID	

monthly – 4 days – power-cut

B. PROCESS DETAILS

1. Process Steps: Sulphonation – material deep at zero degree (chilling) – filtration – spraying (drying) – packing
2. Typical form of energy used (gas, oil, electricity etc.) and quantity per month:

C. INPUT DETAILS

(Please provide last one year data)

Sl. No.	Electricity form GRID	Unit	Total
1	Total Purchase Electricity from the grid (Electrical board/ Company) last year	MU	
2	Average unit cost of the electricity (purchased)	Rs/ Unit	
3	Total availability of grid power	%	
4	Power factor	PF	

D. DETAILS OF TECHNOLOGY UPGRADATION INPUT

Please provide last one year data

compressor (6-piston).

– chilling plant 2 nos – 15 TR – 100 HP, chilling – 130 HP. 15 years.

Gas
– Boiler – 2 Ton. (new)
– Thermic fluid heater – 1.25 T.
– Hot Air generator (250°C) 2 nos (spin – flash dryers – pigment, copper)
– 2 Spray dryer.

1

Scoping study of Ankleshwar Chemical Industries for UNIDO MSME GEF-5 Project

Sl. No	Area	Resulting Energy Saving	Approx. Investment done (in lakhs)	Investment done by own /other agency (if other agency please provide the name)
1	Technology Change			
2	Process Modification			
3	O & M Practice			
4	Training and development of employees / worker about Energy Efficiency			

E. MAJOR ENERGY CONSUMING FACILITIES

Sl. No	Retrofit / Utility	Rating / Design parameter	Make and model	Total no	Investment (Rs) for single unit
1	Energy efficient drives				
2	Pumps				
3	Fans				
4	Motor				
5	lighting system etc				
6	Compressors				
7	Others				

G. OTHER: - VFD - is used in SFD.

a) Previous energy efficiency interventions and their outcome/ learning (agencies that initiated, volume of funding duration and fate)

b) Please write the specific area where you want to improve the energy efficiency

c) Whether the unit owners are interested for implementation of new EE technologies.

d) What are the major barriers for implementation of EE technologies in the cluster

- All lighting LED. main interest
- Gas consumption reduction - Entrepreneurs interested,
- Export demand has reduced by 30%.
- Company is export oriented.

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- Dyes plant - GLD · rod - 15HP.
  2 - 10 HP
  open van - 3HP × 3.
  open valu. 20 HP.
  Spray dryer - 40 HP
  - 25HP
- Rewinding done

Scrubber pump
1 - 5HP
Screw pump - 2HP
Rotary v. - 2HP.
Ice plant. 100 HP
~~[illegible]~~ (flake ice) 30 HP.

Pragna Dychem Ltd.

Scoping study of Ankleshwar Chemical Industries for UNIDO MSME GEF-5 Project

A. DETAILS OF THE UNIT/ FACTORY

1	Name and contact address	Pragna Dyechem Pvt Ltd, Plot No. 1210, GIDC Estate, Ankleshwar
3	Type of Products	Nitrobenzene.
4	Total Yearly Production capacity in Tons/Pieces	250 MT/year.
5	Total Contracted demand of electrical load (KVA) for the factory excluding domestic use	800 KVA.
6	Total capacity of generator set (KVA) /own generation	400 KVA
7	Demand of Gas or Coal per month	23000 SCM./month.
9	Contact person with phone no. and email ID	Sitaram Patel :- 9913016035 sitaram@pragnadyechem.com

B. PROCESS DETAILS

1. Process Steps: → 0-5°C Nitration Addition Reaction.
2. Typical form of energy used (gas, oil, electricity etc.) and quantity per month: - Gas & Electricity

C. INPUT DETAILS

(Please provide last one year data)

Sl. No.	Electricity form GRID	Unit	Total
1	Total Purchase Electricity from the grid (Electrical board/ Company) last year	MU	
2	Average unit cost of the electricity (purchased)	Rs/ Unit	7.15
3	Total availability of grid power	%	92%.
4	Power factor	PF	0.999.

D. DETAILS OF TECHNOLOGY UPGRADATION INPUT

Please provide last one year data

Gas - Rs 6,00,000 to Rs 7,00,000/month
Electricity Rs 25,00,000 to 30,00,000
SCM-gas - Rs 32

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Scoping study of Ankleshwar Chemical Industries for UNIDO MSME GEF-5 Project

One motor - chilling plan
150 HP - of IE3

Sl. No	Area	Resulting Energy Saving	Approx. Investment done (in lakhs)	Investment done by own /other agency (if other agency please provide the name)
1	Technology Change			
2	Process Modification			
3	O & M Practice			
4	Training and development of employees / worker about Energy Efficiency			

E. MAJOR ENERGY CONSUMING FACILITIES

Sl. No	Retrofit / Utility	Rating / Design parameter	Make and model	Total no	Investment (Rs) for single unit
1	Energy efficient drives				
2	Pumps				
3	Fans				
4	Motor				
5	lighting system etc				
6	Compressors				
7	Others				

G. OTHER:

- Chilling plant has been put capacitor banks to improve power factor, from 110 to 80 reduced

a) Previous energy efficiency interventions and their outcome/ learning (agencies that initiated, volume of funding duration and fate)

b) Please write the specific area where you want to improve the energy efficiency

c) Whether the unit owners are interested for implementation of new EE technologies.

- VFD in 150 HP motor
- (depends ~~[illegible]~~ at what efficiency it runs)

d) What are the major barriers for implementation of EE technologies in the cluster

- Pumps - (5 HP - 10 HP) - [illegible] - IE1
Gujarat Gas (supp gas).
= Reactor - 33 nos
- Agitator - Various types.

3 - chilling plant - 150 HP
2 - Chillers 100 HP
- LED - All LED.

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- 3 AC
- New panel ordered for improving PF by 0.994.
- Boiler - gas fired 2 Ton.
- Hot air chamber - gas fired.
- Compressor - chilling compressor - 5 - 4 reciprocating + 1 screw (capacity)

Dynamic Products Limited

Scoping study of Ankleshwar Chemical Industries for UNIDO MSME GEF-5 Project

A. DETAILS OF THE UNIT/ FACTORY

1	Name and contact address	DYNEMIC PRODUCTS LTD. ~~B301, Satyamev Complex, opp. [illegible]~~ 6409/1, GIDC Estate, Ankleshwar -393002
3	Type of Products	Pyrazolone, food colour
4	Total Yearly Production capacity in Tons/Pieces	250 MT/month.
5	Total Contracted demand of electrical load (KVA) for the factory excluding domestic use	950 KVA.
6	Total capacity of generator set (KVA) /own generation	500 KVA
7	Demand of Gas or Coal per month	1.5 to 2 Lakh SCM/month
9	Contact person with phone no. and email ID	Ramesh Patel, Technical Director Ph. 9824147117, ramesh@dynemic.com.

7 to 8 Lakhs M/month

B. PROCESS DETAILS

1. Process Steps: Batch process. { Diazotisation → Reduction → Hydraulics, Esterification → Condensation → Isolation.
2. Typical form of energy used (gas, oil, electricity etc.) and quantity per month:

C. INPUT DETAILS

(Please provide last one year data)

Sl. No.	Electricity form GRID	Unit	Total
1	Total Purchase Electricity from the grid (Electrical board/ Company) last year	MU	3 lakhs unit/month → 230 lakh/month
2	Average unit cost of the electricity (purchased)	Rs/ Unit	7.5
3	Total availability of grid power	%	
4	Power factor	PF	0.98 to 0.99

250 KVAR

D. DETAILS OF TECHNOLOGY UPGRADATION INPUT

110 TR chilling plant

Screw compressor 100 HP → 2 no's

Please provide last one year data

operating Hours 24 hrs

Air compressors → 30 HP.

Gas fired.

EESL UNITED NATIONS INDUSTRIAL DEVELOPMENT ORGANIZATION

Thermic fluid Heater → 1000000 Kcal
→ 600000 Kcal

50% LED Conversion completed.

10 VFD's installed on Reactors, Centrifugal pump etc.

HWG → 650000 Kcal.
2.5 Lakh Kcal
10 Lakh Kcal

Total 150 motors approx.

* 2E action taken every month.
Air to fuel Correction.

Boiler → 3 TON. → 9.5 Kg/cm2

12.0 PHOTOGRAPHS