DETAILED PROJECT REPORT
ON
NATURAL GAS BASED CO_GEN (600 kW)
(SURAT TEXTILE CLUSTER)

Bureau of Energy Efficiency

Prepared By

ZenithEnergy
Horizons Beyond Energy

Reviewed By

ISTSL

NATURAL GAS GENATATOR BASED CO-GENERATION SYSTEM (600 kW)

SURAT TEXTILE CLUSTER

BEE, 2010

Detailed Project Report on Natural Gas Generator based Co-generation system (600 kW)

Textile SME Cluster, Surat, Gujrat (India)

New Delhi: Bureau of Energy Efficiency;

Detail Project Report No.: **SRT/TXT/NGP/05**

For more information

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Acknowledgement

We are sincerely thankful to the Bureau of Energy Efficiency, Ministry of Power, for giving us the opportunity to implement the 'BEE SME project in "Surat Textile Cluster, Surat". We express our sincere gratitude to all concerned officials for their support and guidance during the conduct of this exercise.

Dr. Ajay Mathur, Director General, BEE
Smt. Abha Shukla, Secretary, BEE
Shri Jitendra Sood, Energy Economist, BEE
Shri Pawan Kumar Tiwari, Advisor (SME), BEE
Shri Rajeev Yadav, Project Economist, BEE
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We take this opportunity to express our appreciation for the excellent support provided by Textile Unit Owners, Local Service Providers, and Equipment Suppliers for their active involvement and their valuable inputs in making the program successful and in completion of the Detailed Project Report (DPR).

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Zenith Energy Services Pvt. Ltd.

Hyderabad

Contents

List of Annexure

List of Tables

List of Figures

List of Abbreviation

- BEE - Bureau of Energy Efficiency
- BoI - Bank of India
- DPR - Detailed Project Report
- DSCR - Debt Service Coverage Ratio
- GHG - Green House Gases
- HP - Horse Power
- IRR - Internal Rate of Return
- ID - Induced Draft
- MSME - Micro Small and Medium Enterprises
- NPV - Net Present Value
- ROI - Return On Investment
- SME - Small and Medium Enterprises
- WHRB - Waste Heat Recovery Boiler
- NG - Natural Gas

EXECUTIVE SUMMARY

Zenith Energy Services Pvt. Ltd. is executing BEE-SME program in Surat Textile Cluster, supported by Bureau of Energy Efficiency (BEE) with an overall objective of improving the energy efficiency in cluster units. Surat is renowned for the synthetic sarees and dress materials and there are about 450 above industries in the cluster. The major Energy forms used in the cluster are Electricity and Fuels like Imported Coal, Lignite, Natural gas and Biomass (Groundnut husk briquettes and Wood). Electricity is used for driving the prime movers of pumps, fans, drives, and for lighting. Lignite and imported coal are used in boilers for steam generation. Natural gas is used in Stenter's (for heat setting) and natural gas based generators

The cost of energy as a percentage of manufacturing cost varies anywhere between 12 to 15%, which includes electrical as well as thermal. Majority of the industries located in Surat is of wet process and a very few units are engaged in production of cotton fabric with power looms and warping machines. Wet process requires high amounts of thermal energy in the form of hot water and steam, inducing a high share of energy cost. The energy cost is next to the raw materials cost. Processing is the weakest link in the supply chain of textile.

This DPR highlights the details of the study conducted for assessing the potential for installation of natural gas generator (600 kW) with waste heat recovery system for steam generation in various units of the cluster, possible electricity & coal savings and its monetary benefit, availability of the technologies/design, local service providers, technical features and proposed equipment specifications, various barriers in implementation, environmental aspects, estimated GHG reductions, capital cost, financial analysis, and schedule of Project Implementation. The monetary benefits of the installation are estimated to be Rs. 56.19 Lakh per year.

This bankable DPR also found eligible for subsidy scheme of MoMSME for "Technology and Quality Upgradation Support to Micro, Small and Medium Enterprises" under "National Manufacturing and Competitiveness Programme". The key indicators of the DPR including the Project cost, debt equity ratio, monetary benefit and other necessary parameters are given in table below:

S.No	*Particular*	*Unit*	*Value*
1	Project cost	₹(in Lakh)	187.15
2	Monetary benefit	₹ (in Lakh)	56.19

S.No	Particular	Unit	Value
3	Simple payback period	years	3.30
4	NPV	₹(in Lakh)	62.53
5	IRR	%age	17.67
6	ROI	%age	19.76
7	Average DSCR	Ratio	1.62
8	Process down time	Days	10

The projected profitability and cash flow statements indicate that the project implementation i.e. installation of natural gas generators will be financially viable and technically feasible option for the cluster units.

ABOUT BEE'S SME PROGRAM

Bureau of Energy Efficiency (BEE) is implementing a BEE-SME Programme to improve the energy performance in 25 selected SMEs clusters. Surat Textile Cluster is one of them. The BEE's SME Programme intends to enhance the energy efficiency awareness by funding/subsidizing need based studies in SME clusters and giving energy conservation recommendations. For addressing the specific problems of these SMEs and enhancing energy efficiency in the clusters, BEE will be focusing on energy efficiency, energy conservation and technology up-gradation through studies and pilot projects in these SMEs clusters.

Major activities in the BEE -SME program are furnished below:

Energy use and technology audit

The energy use technology studies would provide information on technology status, best operating practices, gaps in skills and knowledge on energy conservation opportunities, energy saving potential and new energy efficient technologies, etc for each of the sub sector in SMEs.

Capacity building of stake holders in cluster on energy efficiency

In most of the cases SME entrepreneurs are dependent on the locally available technologies, service providers for various reasons. To address this issue BEE has also undertaken capacity building of local service providers and entrepreneurs/ Managers of SMEs on energy efficiency improvement in their units as well as clusters. The local service providers will be trained in order to be able to provide the local services in setting up of energy efficiency projects in the clusters

Implementation of energy efficiency measures

To implement the technology up-gradation project in the clusters, BEE has proposed to prepare the technology based detailed project reports (DPRs) for a minimum of five technologies in three capacities for each technology.

Facilitation of innovative financing mechanisms for implementation of energy efficiency projects

The objective of this activity is to facilitate the uptake of energy efficiency measures through innovative financing mechanisms without creating market distortion

1 INTRODUCTION

1.1 Brief about the SME cluster

The products manufactured in Surat Textile Cluster are synthetic sarees and dress materials and the products are renowned in the country and abroad. The main raw material for the cluster units is grey cloth and is procured local weaving units and agents. The cost of energy (electrical and thermal energy) as percentage of manufacturing cost varies between 12 and 15%.

Majority of the cluster units are of integrated type, where the raw material "grey cloth" is processed in-house to the final product like sarees and dress materials. Most of the units of the cluster are working on Job basis, where the textile agents will provide design and grey cloth and the unit process as per design provided by the clients. The energy cost is next to the raw materials cost.

Production process

The main process operation for dyeing and printing process of synthetic sarees and dress materials adopted in cluster units are as follows:

Fabric Pre-treatment

The main purpose of the fabric pre-treatment process is to remove oil, grease and other materials and to whiten the grey cloth though bleaching. The various process adopted in pre-treatment are scouring, bleaching and shrinking process.

Dyeing

Dyeing is the process of imparting colors to the material through a dye (color). In which a dye is applied to the substrate in a uniform manner to obtain an even shade with a performance and fastness appropriate to its final use. This process is mainly performed in Jet Dyeing Machines and Jigger machines

Dyeing of fabric is carried out in jet dyeing machines. The temperature of the solution is raised to 50℃. Concentrated dyestuff solution is prepared separately and is added to the liquor. After the addition of dyes, the temperature is raised to 130℃ and maintained for about 60 minutes.

After whitening/dyeing, the fabric is unloaded from the machine and taken to the folding and rolling machines for improving the width of cloth, which gets shrunk during the washing and dyeing process.

Printing

In Surat cluster three types printing methods are used. Most of the units are following the flat bed printing, rotary printing and some units follows hand printing. Hand printing is the old method to print the fabric. The flat bed printing has provision for printing 10 to 14 colors simultaneously. The color print paste prepared is fed onto the screens from which it is transferred to the fabric fed in. The fabric after print paste transfer is passed through a drying chamber at 145℃. The dried and printed fabric is taken for further processing.

Drying and Finishing

After printing, the drying process is performed in loop machine, where the temperature is maintained between 130℃ to 170℃ for better color setting. After passing through the loop machines, the printed fabric is washed in a series of normal water and hot water washing in the presence of chemicals for color setting. After completion of the washing process, the printed and washed fabric is subjected to heat setting process in Stenter and then pressing and finishing treatments.

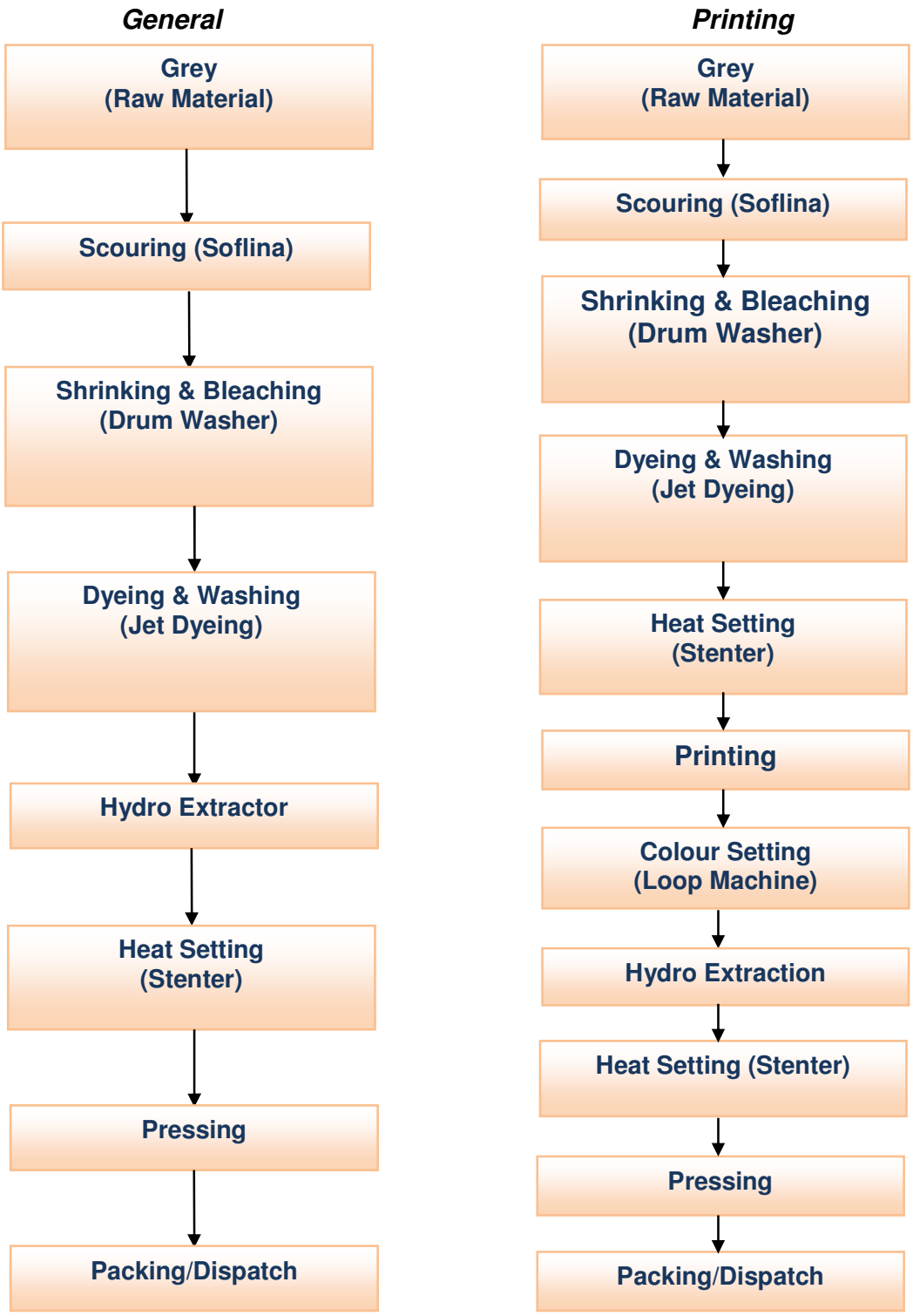


Figure 1.1 Process flow chart of a typical textile unit

1.2 Energy performance in existing situation

1.2.1 Fuel and electricity consumption of a typical unit

The main energy forms used in a typical unit in the cluster are electricity, coal/lignite and natural gas. Electricity is used for driving the prime movers of pumps, fans, stenter fans, ID and FD fans, conveyers, loop machines drives, lighting etc. Imported coal and lignite are used as fuel in boilers for steam generation and whereas natural gas is used as fuel in generators for electricity generation, stenter, printing and loop machines. The energy consumption of a typical unit in the cluster does not have gas based co-generation system and is furnished in Table 1.1 below:

Table 1.1 Energy consumption of a typical unit (Rachana Group of industries)

S.No.	Details	Unit	Value
1	Coal/lignite Consumption	Tonne/annum	2678
2	Grid Electricity consumption	MWh/annum	1971
3	Natural gas consumption	Million SCM/annum	0.829
4	Production (quantity processed)	Lakh mts/annum	245

1.2.2 Average production by a typical unit in the cluster

The average production in a year in a typical unit is 245 lakh meters of final product.

1.2.3 Specific Energy Consumption

Specific energy consumption both electrical and thermal energy per Lakh mts of Production for a typical unit is furnished in Table 1.2 below:

Table 1.2 Specific energy consumption (Shree Hajarimal Dyeing & Printing Mills(P) Ltd)

S. No.	Type of Fuel	Units	Specific Energy Consumption
1	Coal Consumption	Tonne/ Lakh mts	10.93
2	Grid Electricity consumption	MWh/ Lakh mts	8
3	Natural gas consumption	million SCM/ Lakh mts	0.003

Equipment wise Specific Energy Consumption

Specific energy consumption (SEC) of the equipments used in the Surat textile industries is given in Table 1.3 below wherever possible.

Table 1.3 Equipment wise Specific Energy Consumption

Equipment	*Units*	*Minimum SEC*	*Maximum SEC*	*Average SEC (for whole cluster)*
Soflina machines	kWh/meter	0.011	0.013	0.012
Drum Washer machine	kWh/meter	0.012	0.016	0.014
Jet Dyeing machine	kWh/meter	0.016	0.019	0.017
Stenter machine	kWh/meter	0.018	0.020	0.019

1.3 Identification of technology/equipment to be upgraded/changed

1.3.1 Description of current technologies used

The main energy forms used in cluster unit for operating of plant equipments are electricity, natural gas and coal/lignite or wood. All the cluster units are imported electricity from Gujarat electricity board and natural gas from Gujarat Gas Company limited.

1.3.2 Its role in the whole process

The project activity is installation of natural gas based co-generation system is an additional system for generation of electricity for captive purpose and steam for heating application in the process. The prevailing practice in the cluster units for steam generation is boilers and electricity is imported from grid. The project activity will displace the grid electricity and small quantities of steam.

1.4 Establishing the baseline

1.4.1 Design and operating parameters & power consumption

The present power consumption and Contract Maximum Demand of a typical plant in the cluster units is 19,71,084 kWh per annum and 350 kVA respectively.

1.4.2 Electricity and fuel consumption

The Electricity and fuel consumption of three units in the cluster without Natural Gas co-generation system is furnished in Table 1.4 below:

Table 1.4 Electricity and fuel consumption of three units in the cluster

S. No	Name of the unit	Power consumption (kWh/day)	Fuel consumption (tonne/day)	Natural gas consumption (SCM/day)
1	Rachna Group of Industries	9,591	17	3,946
2	Kanishka Prints Pvt. Ltd	3,831	15.42	1,871
3	Shilpa Dyeing & Printing Mills (P) Ltd	2,236	12.34	4,688

1.5 Barriers for adoption of new and energy efficient technology / equipment

1.5.1 Technological Barriers

The major technical barriers that prevented the implementation of the gas based co-generation systems in the cluster are:

- Lack of awareness about natural gas generators with waste heat recovery boilers
- Shortage of expert local service providers

1.5.2 Financial Barrier

Among the SMEs, the larger units, if convinced are capable of either financing it themselves or get the finance from their banks. The smaller units will require competitive loan and other support to raise the loan. However as most of them have been able to expand their setup and grow, there is readiness to spend for energy efficiency technologies which have good returns. Energy Efficiency Financing Schemes such as SIDBI's, if focused on the cluster, will play a catalytic role in implementation of identified energy conservation projects & technologies.

The cluster has significant potential for Natural gas based co-generation system. Though the project activity yields good returns, the project is highly capital intensive.

1.5.3 Skilled manpower

In Surat Textile cluster, the availability of skilled manpower is one of the problems due to more number of units and the migration of the skilled manpower is very high to other units.

This is also one of the main barriers for the penetration of the technology in the cluster. Specialized and focused training of the local service providers on better operation and maintenance of the equipments will improve the skills of the workforce.

1.5.4 Other barrier(s)

Shortage of natural gas supply in the region and frequent change of policies by gas companies on the tariff.

2. TECHNOLOGY/EQUIPMENT FOR ENERGY EFFICIENCY IMPROVEMENTS

2.1 Detailed description of technology/equipment selected

2.1.1 Description of technology

Natural Gas Based Co-Generation system

Natural Gas Engine based co-generation technology, generates electrical energy and small quantities of thermal energy with single fuel i.e., by using Natural gas as a fuel. Further this thermal energy used in the form of steam which is generated by waste heat recovery boiler.

In such system, natural gas is used as a fuel in the engine, after combustion of natural gas mechanical energy is generated which further converted into electrical energy by an alternator. Waste flue gases of the engine emit at the temperature of 350^{O}C to 400^{O}C, which is passes through waste heat recovery boiler (WHRB) for steam generation. In this case, the capacity of WHRB is 500 kg/hr and about 300 kg/hr of steam is generated at 75% PLF. Secondly, the hot water is also generated through engine cooling heat exchanger at a temperature of 75^{O}C to 80^{O}C. This water can be used for the boiler feed water or for final washing purpose. The Schematic diagram of the Natural Gas Based Co-generation system is furnished below:

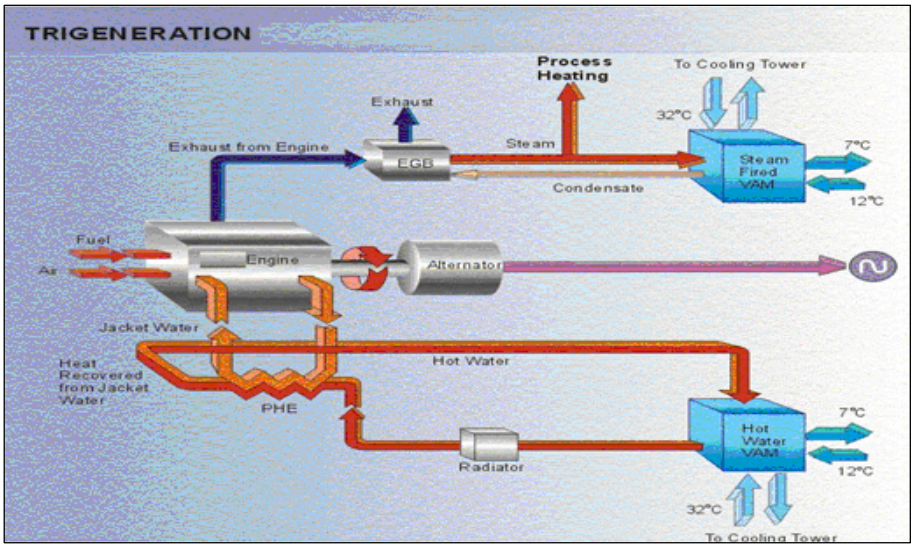


Figure 2.1 Schematic Diagram of Natural Gas Generator

Figure 2.2 Typical Gas Based CHP Model

2.1.2 Technology/equipment specifications

The capacity of the proposed natural gas generator is 600 kW and the details of the technical specifications are given below:

Technical Boundary Conditions (Standards) to be maintained

The specified technical data are based on the assembly conditions of ISO 3046-1 and VDE 0530 including any applicable deviations and tolerances. The tolerances and conditions of all measuring equipment used are to be considered in favour of the supplier.

The compliance with maintenance intervals and emissions can only be guaranteed if the "Minimum characteristics for fuel gases" are complied with, the required minimum water qualities are observed and oil services are performed in accordance with the manufacturer's instructions.

Technical Circular 0199-99-2105, 7th revision of 21.01.2008, must be observed for the use of lubricating oils.

Technical Circular 0199-99-02091, 6th revision of 01.11.2007, is binding for the engine coolant water quality to be used for MWM engines and quality of water used in heating circuits.

Technical Circular 0199-99-3017, 3rd revision of 21.03.2008, is binding for the released fuel gas qualities to be used for the operation MWM engines.

The requirements of Technical Circular 0199-99-2132 of 02.08.2004 must be complied with for the combustion and intake air.

The operator must document and, where requested by the manufacturer, prove the compliance with the maintenance, repair and fuel specifications. Where such proof cannot be delivered, this will restrict the warranty obligation of the manufacturer.

The installation and erection works at site have to be conducted in accordance with our "Layout of Power Plants driven by Gas and Diesel Engines" status 01-2008. The violation of this guideline can cause damages or failure of the functions of the Genset or of the installation for which MWM cannot accept warranty claims. General specification of fuel and site condition are shown in Table 2.1 and Table 2.2 below

Table 2.1 General Conditions on Site

S.No	*Particular*	*detail*
1	Air Intake Temperature	35 °C
2	Relative Air Humidity	80 %
3	Altitude of Installation	200 m
4	Design Ambient Temperature	45 °C

Table 2.2 Specification of Fuel Gas

S.No.	*Particular*	*Details*
1	Fuel Gas Type	Natural Gas
2	Lower Heating Value for Calculation of Gas Flow	8500 kCal/SCM
3	Methane Number	80 MN
4	Fuel Gas Pressure at the Inlet of the Gas Train	1-3 bar

2.1.3 Justification & Suitability of the technology selected

Natural Gas Generator based co-generation technology generates electricity for the plant and steam for process requirement. Electricity generated by the generator is used in the unit for its machine and other application as well as at the same time waste heat for steam generation. Due to generation of steam from waste heat, coal consumption is partially reduced in the boiler. Electricity unit cost from the grid electricity is costly compared with electricity generation in natural gas generators. Over all energy cost of plant in co-generation mode is lower than the present scenario. Further, the hot water generated from the engine cooling can also be used for the process hot water requirement which is again additional benefit of this technology. Following are the main reasons for selection of this technology:

- project will reduce energy cost
- Provides free steam and hot water
- It reduces the GHG emissions

2.1.4 Superiority over existing technology/equipment

The installation of natural gas based co-generation system for generation of electricity and steam has the following advantages:

- To supply clean power by utilization of cleaner fuel *i.e.* natural gas.
- To ensure contribution towards sustainable development through social, economic environmental and technological aspects

Advantages

- Lowest running cost
- particulate free combustion
- Low emission
- Longer service life
- No dilution of lube oil
- Compact size
- Easy paralleling
- No fuel storage and handling
- Extended lube oil and filter change period

2.1.5 Availability of the proposed technology/equipment

The natural gas generator with waste heat recovery boiler suppliers is available in local and in Surat city. The details are provided in Annexure - 7.

2.1.6 Source of technology/equipment for the project

The technology is locally available.

2.1.7 Service/technology providers

The service providers are available in Surat.

2.1.8 Terms of sales

Terms & Conditions for Sale

Scope

The design and manufacturer of power plant equipment supplied under this offer are as per the enclosed scope document (Scope of Supply/Services). Any detailed quality plan, audit of procedures, inspection and test would be in addition to contract value.

Order Confirmation

All orders placed on us directly or through our Regional Offices will be binding on us only after our Head Office in Noida has issued an order confirmation.

Specifications

Specifications, dimensions, description, shade of paints, etc. are not binding on us in minute details and are subject to reasonable alterations without notice.

Basis of Offer

- The prices offered for indigenous scope are based on our Std. Power House Layout. The auxiliary equipment offered are standard in nature and do not cater to any specific requirements except otherwise mentioned in the specifications.
  - It is assumed that the contract will be split in to 3 parts namely
  - CFR Offshore Supply for Genset portion only
  - Local Supply for the balance of the plant/accessories of the genset.
- On shore services for design and engineering and supervision of erection and commissioning
- Customs Duty and Port Clearance / Custom Clearance Charges on Offshore supplies are not included and shall be paid, as applicable, by client at actual directly to the concerned authorities.
- ED (where applicable), CST @ 2% against C-Form (Sales Tax as applicable), on Indian Supplies shall be charged extra at actual. Any other taxes and duties that may become applicable are to the Client's account.
- Service tax as applicable shall be charged extra on the Services.
- Nhava Sheva (Mumbai) is considered as the destination Port for shipping the genset.

- Price for Imported Scope has been offered in Euros. However, all the payments to be made for this shall be in Indian Rupees (INR) only, the exchange rates for the payments shall be made on prevailing exchange rates on the date of final payment/transfer.
- Prevailing Exchange Rates would be forward cover rate at the time of maturity of L.C. Buyer would give his consent about the rate before opening the LC in writing to us.

Sales Tax Registration Details

PAN No.: AABCG8829R

TIN No.: 07790260143

Sales Tax No.: AABCG8829RST001

Terms of Payment

For Offshore Supply

The IMPORTED SUPPLY CONTRACT Prices is based on the following payment schedule:

- 30 % Advance Payment to be made upon signing of the CONTRACT against submission of Performa Invoice
- 70 % Payable through an Irrevocable, confirmed Letter of Credit payable at sight opened in favour of Green Power within 15 days of Purchase Order.

All banking charges including the cost of opening and confirmation of L/C shall be borne by the Buyer

For Onshore Supply (GREEN POWER- Local)

- 30% of the value of Purchase Order shall be paid as interest free advance on acceptance of Purchase Order.
- 70% of the value payment along with 100% Taxes against Performa Invoice Prior to Dispatch through DD/ at par cheque.

For Engineering & Commissioning Services

- 50% of the value of Purchase Order shall be paid as interest free advance on acceptance of Purchase Order.

- Balance 50% along with applicable service tax immediately after Commissioning. Road permit Form if applicable to be issued prior to dispatch of material from Green Power's / Vendor Godown

Advances

Advances paid against an order shall not be subject to any interest. We shall have the right to adjust against such advances any payments which might become due because of delay in lifting the ordered equipment or because of any incidental expenses we may incur on the purchaser's behalf. The advance shall be forfeited in case request for cancellation of order is accepted by us.

Prices

While every effort will be made to adhere to the contract price, in the present conditions we cannot guarantee that the contract prices will hold good when the order is executed. The prices of this quotation are based on the prevailing costs of raw materials, bought out components and wages etc. If between the dates of the contract and its completion, variations occur in these costs, our prices may stand revised and the ex-works price ruling at the time of delivery will be applicable. In the normal course we do not anticipate any revisions of ex-works prices to exceed 10% over the contract price of deliveries up to 6 months.

Validity

Unless confirmed in writing for further extension, our offer shall remain valid for the period of 1 month from the date of offer.

General Lien

We shall be entitled to general lien on goods in our possession or dispatched for all money due to us by the purchaser, both under this contract or any other account and we shall also be entitled to apply any money in our hands under any contract due to us under any other contract or contracts.

Execution of High Sea Sales Agreement

As per the Indian Sales Tax Act / Regulation, the High Sea Sales Agreement (format attached) needs to be executed between the parties on a date when the consignment is on high sea i.e. after the date of dispatch from European port & before the date of arrival in Indian port. The Contractor shall contact Owner and on a suitable agreed date the Agreement needs to be signed by both Owner and Contractor. The Original executed High Sea sales Agreement will then be retained by the contractor who, along with other documents

(mentioned under payment terms) will forward it to the owner as one of the LC documents. Triplicate Bill of entry would be made available to Green Power within seven days of releasing shipment.

Delivery

Delivery of Imported Genset shall be between 16 – 18 weeks, Ex-works Germany. Delivery of indigenous supplies shall be within 4-5 months ex- Green power/ vendor basis. The above deliveries are from the date of full advance payment along with technically & commercially clear Purchase order. The above delivery is subject to timely opening of L/C as mentioned in our offshore payment terms. The delivery schedule is subject to "Force Majeure" conditions also.

Erection and Commissioning

We have allowed for times for Supervision of Commissioning according to our estimates. Purchaser shall provide local travel facilities to our Supervisor(s). Also should any additional time be required for Erection, for reasons not attributable to MWM / GREEN POWER, this would be charged at prevailing daily rates.

Warranty

- MWM/Green Power shall at its own expense and at the sole option of the MWM/Green Power, exchange, replace or repair such part of the Gensets which have failed or which have essential impact on their usability during a period of 12 months after the date of commissioning of the Gensets or 18 months after the transfer of risks to you., whichever period expires first, solely as a result of a substantial deficiency which was inherent in Gensets or the part thereof before transfer of risks and due to faulty design, faulty material or bad workmanship
- You will promptly notify the MWM/Green Power in writing of obvious defects or deficiencies after detection thereof. Replaced parts shall become the property of the MWM/Green Power upon request of the MWM/Green Power
- The MWM/Green Power is not liable or defects or deficiencies which are resulting from the following reasons, as long as they are not resulting from a default of MWM/Green Power: Improper, unsuitable or negligent use, handling and/or operation of the Gensets by you. or third parties; use of spare parts other than Genuine MWM/Green Power Parts; normal wear and tear; use of unsuitable consumables (such as, fuel, oil cooling liquid or any other consumables), particularly the use of consumables not conciliated in the Operation manuals; improper building ground;

chemical, electro- chemical or electric influences. You have to agree to indemnify the MWM/Green Power from all claims (including claims of third parties) in connection with or resulting from the above mentioned defects.

- MWM/Green Power shall bear – insofar as the compliant is legitimate – out of all costs directly arising from repair or replacement only the costs for the spare part including the delivery costs and the reasonable costs for removal and mounting, as well, if this can be fairly required in the individual case, costs for eventual necessary mechanics and back staff of MWM/Green Power. Other costs shall be borne by you.

Confidentiality

Except with the consent in writing of MWM / GREEN POWER, the Purchaser shall not disclose technical specification, layout drawings, process details or any other proprietary information supplied along with this offer and subsequently.

Effective Date

Effective date of PO/Contract shall take place upon fulfillment of the following conditions precedent:

- PO/Contract is signed.
- Advance payment as stipulated is received by Supplier.
- Irrevocable L/C at sight as stated has been established by the Purchaser within the specified period and has been accepted by us.

Transfer of Title

Transfer of title shall take place after signing of the High Seas Sales agreement between both the parties.

Cancellation

Order received and acknowledged by us shall not be subject to cancellation, either wholly or partly for any reason whatsoever without our consent.

Force Majeure

A “Force Majeure Event” shall mean any unforeseeable act or event that prevents the affected party from performing its obligations under this agreement or complying with any conditions required by the other party under this agreement if such act or event is beyond the reasonable control of and not the fault of the affected party and such party has been unable to avoid such act or event by the exercise of prudent foresight and due diligence such as a) war

and other hostilities (whether war be declared or not), invasion, act of foreign enemies, mobilisation, requisition or embargo; (b) ionising radiation or contamination of nuclear fuel, radioactive toxic explosives, or other hazardous properties of any explosive nuclear assembly or nuclear components thereof; (c) rebellion, revolution, insurrection, military or usurped power and civil war; (d) riot, civil commotion, terrorism or public disorder except where solely restricted to employees of Supplier or any subcontractor (e) flood, lightning, cyclone, typhoon, earthquake, fire, explosion, shipwrecks, transportation accident or other accidents or act of God; (f) discovery of historically significant artifacts on the facility site.

Arbitration

- This Order is to be construed and shall be governed by and interpreted in accordance with the laws of India
- All disputes and differences which may arise out of or in connection with the present Agreement, or the breach thereof, which cannot be settled amicably between Customer and Green Power / MWM shall be finally settled excluding any other jurisdiction but for enforcement of the arbitral award, by arbitration under the Rules of Arbitration of the Indo-German Chamber of Commerce then in force. The Indian Arbitration & Conciliation Act, 1996 and the rules made there under shall be used
- The award of the arbitrator shall be final and binding on the parties hereto
- The language of Arbitration shall be the English language
- The arbitration award shall be final and binding on Customer and Green Power / MWM and subject to no appeal and shall deal with the question of the costs of arbitration and all matters relating thereto.

2.1.9 Process down time during implementation

The process down time is for installation of gas based co-generation system is considered at 10 days.

2.2 Life cycle assessment and risks analysis

The operational life cycle of the gas based co-generation system is considered to be 15 years.

2.3 Suitable unit/plant size for the identified technology option

The proposed gas based co-generation system is considered at 600 kW, suitable for plants having production capacity of more than 50,000 meters/day to 80,000 meters/day.

3. ECONOMIC BENEFITS OF NEW ENERGY EFFICIENT TECHNOLOGY

3.1 Technical benefits

3.1.1 Fuel savings per year

It is estimated that Installation of natural gas generator with waste heat recovery boiler generate about 300 kg/hr of steam at 7 bar during normal operation. Hence, total coal savings are estimated at 180 tonne per annum considering 12 hours of operation per day and 350 days in a year.

3.1.2 Electricity savings per year

Proposed natural gas generator generates about 18,90,000 kWh of electricity at 75% plant load factor. Since cost of grid electricity is more than the cost of electricity generated by natural gas based natural gas generator hence, the project activity reduces electricity cost due to low cost of natural gas.

3.1.3 Improvement in product quality

There is no significant impact on product quality.

3.1.4 Improvement in production

There is no significant impact on production.

3.1.5 Reduction in raw material consumption

No significant impact on the raw materials consumption.

3.1.6 Reduction in other losses

Not applicable

3.2 Monetary benefits

The project activity reduces electricity cost due to low cost of natural gas and also reduces coal consumption in the boiler. Monetary savings due to implementation of proposed project is ₹ 56.19 lakh per annum. Details of monetary benefit are given in Annexure - 3.

3.3 Social benefits

3.3.1 Improvement in working environment in the plant

As installation of gas based co-generation eliminates grid electricity supply and some amounts of steam requirement in the process. The employment opportunities for professional, skilled and unskilled labour for development, engineering, procurement, construction, operation and maintenance of the project activity will enhance in the area.

3.3.2 Improvement in skill set of workers

The technology selected for the implementation is new and implemented of it will create awareness among the workforce and improves skills of the workers.

3.4 Environmental benefits

3.4.1 Reduction in effluent generation

There is no significant impact in effluent generation due to implementation of the project activity.

3.4.2 Reduction in GHG emission such as CO2, NOx, etc

The major GHG emission reduction source is CO_2. The technology will reduces GHG emissions as the natural gas will have less CO_2 emission than coal fired power and also due to reduction in coal consumption in the boilers. The emission reductions are estimated at 800 tonne of CO_2 per annum by implementation of the project activity.

3.4.3 Reduction in other emissions like SOx

No significant impact on SO_x emissions.

4. FINANCIAL ANLYSIS OF NEW ENERGY EFFICIENT TECHNOLOGY

4.1 Cost of technology/equipment implementation

4.1.1 Cost of technology/equipments

The total cost for installation of gas based co-generation system is estimated at Rs. 117.65 Lakh (1Euro=65 INR),

4.1.2 Other costs

The erection and commissioning and electrical modifications is estimated at ₹ 8.50 Lakh. Other cost which includes which includes generator, waste heat recovery boiler, cooling tower, Panel, pumps switches and cabling Rs. 61.00 Lakh.

Detail of total project cost is furnished in Table 4.1 below:

Table 4.1 Details of project cost

S. No.	Details	Cost (₹ in lakh)
1	Plant equipment and machinery and electrical works	117.65
2	Other cost	61.00
3	Erection & Commissioning	8.50
4	Interest during implementation (preliminary & pre- operative expenses)	0.00
5	Total	187.15

4.2 Arrangement of funds

4.2.1 Entrepreneur's contribution

The entrepreneur's contribution is 25% of total project cost, which works out at Rs. 46.79 lakh.

4.2.2 Loan amount

The term loan is 75% of the total project, which is ₹ 140.36 lakh.

4.2.3 Terms & conditions of loan

The interest rate is considered at 10% which is prevailing interest rate of SIDBI for energy efficient technologies. The loan tenure is 7 years and the moratorium period is 6 months.

4.3 Financial indicators

4.3.1 Cash flow analysis

Considering the above discussed assumptions, the net cash accruals starting with ₹ 23.96 lakh in the first year operation and increases to ₹ 197.49 lakh at the end of tenth year.

4.3.2 Simple payback period

The total project cost of the proposed technology is ₹ 187.15 lakh and monetary savings due to reduction in electricity consumption is ₹ 56.19 lakh and the simple payback period works out to be 3.30 years.

4.3.3 Net Present Value (NPV)

The Net present value of the investment at 10% interest rate works out to be ₹ 62.53 lakh

4.3.4 Internal rate of return (IRR)

The after tax Internal Rate of Return of the project works out to be 17.67%. Thus the project is financially viable.

4.3.5 Return on investment (ROI)

The average return on investment of the project activity works out at 19.76%

4.4 Sensitivity analysis in realistic, pessimistic and optimistic scenarios

A sensitivity analysis has been worked out to ascertain how the project financials would behave in different situations like there is an increase in monetary savings or decrease. For the purpose of sensitive analysis, two scenarios are considered are.

- Increase in monetary savings by 5%
- Decrease in monetary savings by 5%

In each scenario, other inputs are assumed as constant. The financial indicators in each of the above situation are indicated along with standard indicators. The sensitivity analysis of this project is shown in Table 4.2 below.

Table 4.2 Sensitivity analysis of project at different scenario

Particulars	*IRR*	*NPV*	*ROI*	*DSCR*
Normal	17.67	62.53	19.76	1.62
5% increase in power savings	18.97	73.93	20.07	1.70
5% decrease in power savings	16.34	51.14	19.40	1.55

As can be seen from above, the project is highly sensitive to monetary savings, the debt service coverage ratio works out to be 2.87 times in worst scenario, which indicates the strength of the project.

4.5 Procurement and implementation schedule

S. No.	Activities	Weeks											
		1	2	3	4	5	6	7	8	9	10	11	12
1	Foundation & civil work												
2	Supply, Erection & commissioning of the Generator set												
3	Cabling & electrical panel fitting												
4	Testing and trial												
5	On site operator training												

Annexure

Annexure 1 Baseline data for installing Natural Gas Generator

Case 1: Shree Hajarimal Dyeing & Printing Mills (P) Ltd

S. No.	Parameter	Unit	Value
1	Contract Maximum Demand	kVA	350
2	Electricity Consumption per annum	kWh	19,71,084
3	Electricity Bill per annum	₹ in lakh	109.44
4	Capacity of the Boiler	TPH	4
5	Coal Consumption per annum	Tonne	2,640
6	Coal Bill per annum	₹ in lakh	147.31

Case 2 Kanishka Prints Pvt. Ltd

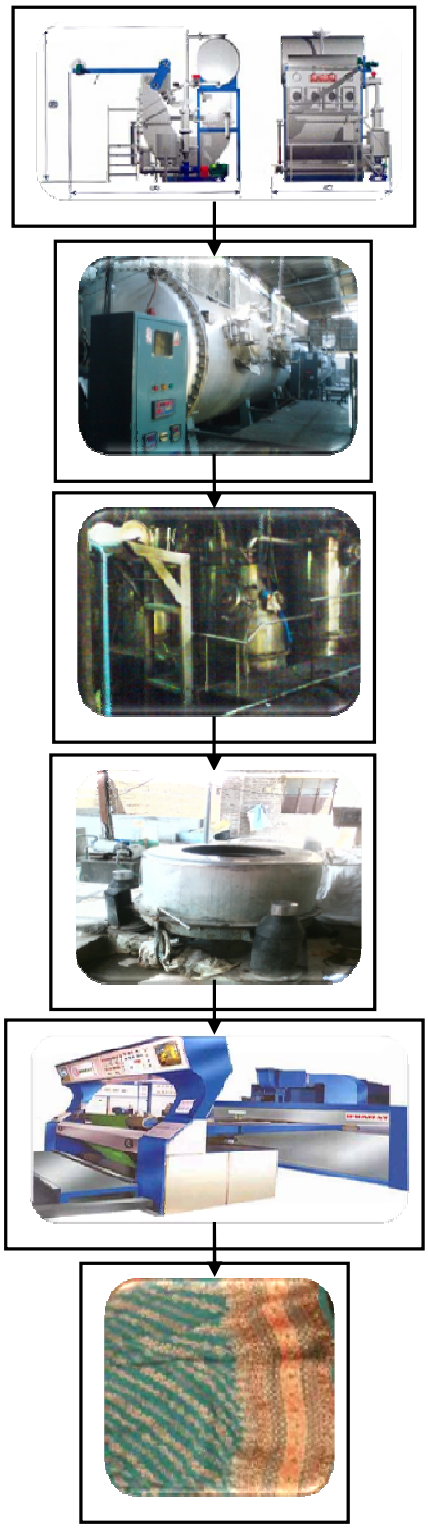
S. No.	Parameter	Unit	Value
1	Contract Maximum Demand	kVA	450
2	Electricity Consumption per annum	kWh	1340868
3	Electricity Bill per annum	₹ in lakh	77.04
4	Capacity of the Boiler	TPH	5
5	Coal Consumption per annum	Tonne	5520
6	Coal Bill per annum	₹ in lakh	137.64

Case 3 Shilpa Dyeing & Printing Mills (P) Ltd

S. No.	Parameter	Unit	Value
1	Contract Maximum Demand	kVA	350
2	Electricity Consumption per annum	kWh	782820
3	Electricity Bill per annum	₹ in lakh	47.76
4	Capacity of the Boiler	TPH	8
5	Coal Consumption per annum	Tons	4320
6	Coal Bill per annum	₹ in lakh	237.6

Annexure 2 Process flow diagram

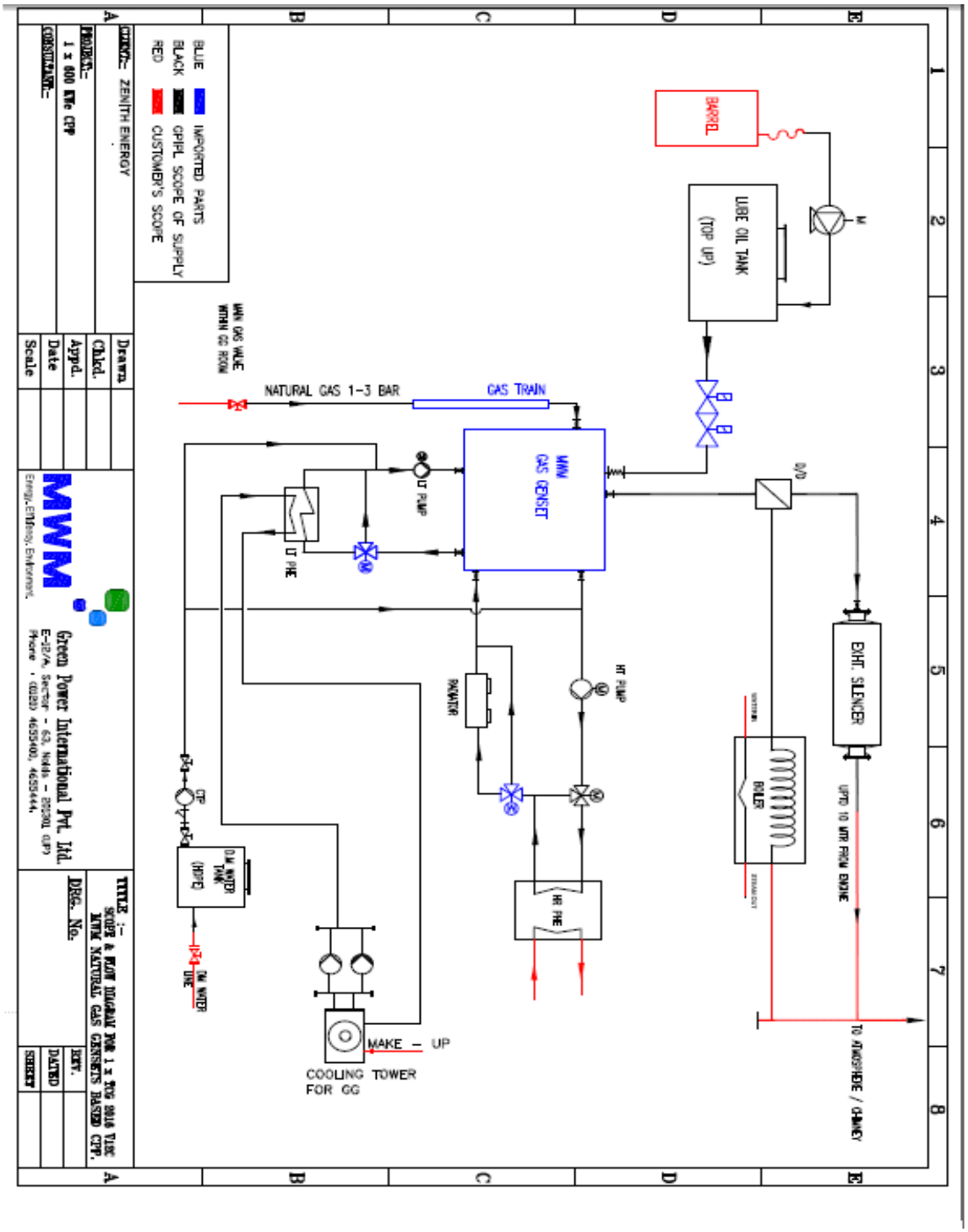
Process flow diagram of Surat Textile Industry

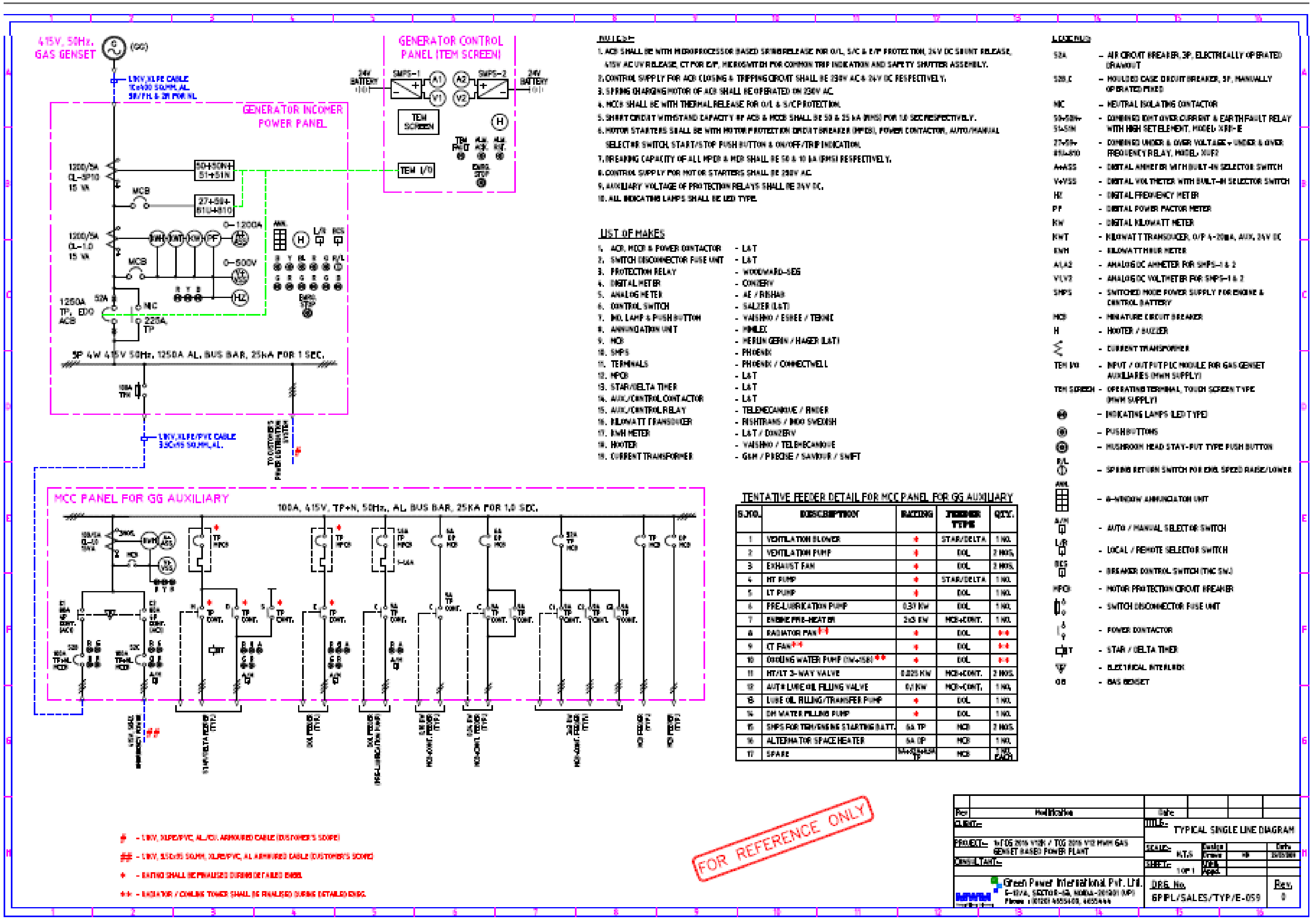


Annexure 3 Detailed technology assessment

S.No.	Parameter	Unit	Value
1	Capacity of NG Generator	kW	600
2	Plant Load factor	%age	75%
3	No. of hours of operation	Hours/day	12
4	No. of days of operation	Days/annum	350
5	Lower calorific value of NG	kCal/SCM	8500
6	No. of units generated	kWh/annum	18,90,000
7	Efficiency of gas engine	%age	42
8	Gas Consumption	SCM/kWh	0.24
9	Cost of gas	₹/SCM	12.32
10	Electricity Unit Cost	₹./kWh	2.96
11	Grid Electricity Cost	₹/kWh	5.6
12	Monetary benefit per unit	₹/kWh	2.64
13	Monetary benefit	₹ in lakh/annum	49.89
14	Quantity of steam generation	kg/hr	300
15	Steam to coal ratio	Ratio	7:1
16	Coal savings	kg/hr	43
17	Coal Cost	₹/kg	3.5
18	Average monetary benefit due to reduction in coal consumption	₹ in lakh/annum	6.30
19	Total monetary benefit (Coal + electricity)	₹ in lakh/annum	56.19
20	Average monetary benefit per unit	₹/kWh	2.903

Annexure 4 Drawings for proposed electrical and civil work required





TENTATIVE FEEDER DETAIL FOR MCC PANEL FOR GG AUXILIARY

S.NO.	DESCRIPTION	RATING	FEEDER TYPE	QTY.
1	VENTILATION BLOWER	*	STAR/DELTA	1 NO.
2	VENTILATION PUMP	*	DOL	2 NOS.
3	EXHAUST FAN	*	DOL	2 NOS.
4	HT PUMP	*	STAR/DELTA	1 NO.
5	LT PUMP	*	DOL	1 NO.
6	PRE-LUBRICATION PUMP	0.37 KW	DOL	1 NO.
7	ENGINE PRE-HEATER	2x3 KW	MCB+CONT.	1 NO.
8	RADIATOR FAN **	*	DOL	**
9	CT FAN **	*	DOL	**
10	COOLING WATER PUMP (1W+1SB) **	*	DOL	**
11	HT/LT 3-WAY VALVE	0.025 KW	MCB+CONT.	2 NOS.
12	AUTO LUBE OIL FILLING VALVE	0.1 KW	MCB+CONT.	1 NO.
13	LUBE OIL FILLING/TRANSFER PUMP	*	DOL	1 NO.
14	DM WATER FILLING PUMP	*	DOL	1 NO.
15	SMPS FOR TEM/ENGINE STARTING BATT.	6A TP	MCB	2 NOS.
16	ALTERNATOR SPACE HEATER	6A DP	MCB	1 NO.
17	SPARE	6A+10A+16A TP	MCB	1 NO. EACH

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Annexure 5 Detailed financial calculations & analysis for financial indicators

Assumption

Name of the Technology	*Natural gas generator*		
Rated Capacity	*600 KW*		
Details	*Unit*	*Value*	*Basis*
Installed Capacity	kW	600	
No of working days	Days	350	
No of Shifts per day	Hours/day	12	(Hours in a day)
Capacity Utilization Factor	%	75%	
Proposed Investment			
Plant & Machinery	₹ (in lakh)	117.65	
Service charges towards design and engineering for Electromechanical work and Cabling & Switches	₹ (in lakh)	61.00	
Erection & Commissioning	₹ (in lakh)	8.50	
Investment without IDC	₹ (in lakh)	187.15	
Interest During Implementation	₹ (in lakh)	0.00	
Total Investment	₹ (in lakh)	187.15	
Financing pattern			
Own Funds (Equity)	₹ (in lakh)	46.79	Feasibility Study
Loan Funds (Term Loan)	₹ (in lakh)	140.36	Feasibility Study
Loan Tenure	years	7	Assumed
Moratorium Period	Months	6	Assumed
Repayment Period	Months	90	Assumed
Interest Rate	%	10.00%	SIDBI Lending rate
Estimation of Costs			
O & M Costs	% on Plant & Equip	4.00	Feasibility Study
Annual Escalation	%	5.00	Feasibility Study
Estimation of Revenue			
Monetary benefit due to coal and electricity	₹	5619000	
Savings		1	
St. line Depn.	%age	5.28	Indian Companies Act
IT Depreciation	%age	8.24	Income Tax Rules
Income Tax	%age	33.99	Income Tax

Estimation of Interest on Term Loan *(₹ in lakh)*

Years	*Opening Balance*	*Repayment*	*Closing Balance*	*Interest*
1	140.36	7.50	132.86	12.73
2	132.86	15.00	117.86	12.60
3	117.86	18.00	99.86	10.97
4	99.86	19.00	80.86	9.15
5	80.86	21.00	59.86	7.15
6	59.86	22.00	37.86	5.02
7	37.86	24.00	13.86	2.69
8	13.86	13.86	0.00	0.42
		140.36		

WDV Depreciation

Particulars / years	1	2	3	4	5	6	7	8	9	10
Plant and Machinery										
Cost	187.15	171.73	157.58	144.59	132.68	121.75	111.71	102.51	94.06	86.31
Depreciation	15.42	14.15	12.98	11.91	10.93	10.03	9.21	8.45	7.75	7.11
WDV	171.73	157.58	144.59	132.68	121.75	111.71	102.51	94.06	86.31	79.20

Projected Profitability

Particulars / Years	1	2	3	4	5	6	7	8	9	10
Revenue through Savings										
Fuel savings	56.19	56.19	56.19	56.19	56.19	56.19	56.19	56.19	56.19	56.19
Total Revenue (A)	56.19	56.19	56.19	56.19	56.19	56.19	56.19	56.19	56.19	56.19
Expenses										
O & M Expenses	3.74	3.89	4.05	4.21	4.38	4.55	4.74	4.93	5.12	5.33
Total Expenses (B)	3.74	3.89	4.05	4.21	4.38	4.55	4.74	4.93	5.12	5.33
PBDIT (A)-(B)	52.45	52.30	52.14	51.98	51.81	51.64	51.45	51.26	51.07	50.86
Interest	12.73	12.60	10.97	9.15	7.15	5.02	2.69	0.42	-	-
PBDT	39.72	39.69	41.18	42.83	44.66	46.62	48.76	50.85	51.07	50.86
Depreciation	9.88	9.88	9.88	9.88	9.88	9.88	9.88	9.88	9.88	9.88
PBT	29.84	29.81	31.29	32.94	34.78	36.74	38.88	40.96	41.19	40.98
Income tax	8.26	8.68	9.58	10.51	11.47	12.44	13.44	14.41	14.72	14.87
Profit after tax (PAT)	21.58	21.13	21.71	22.44	23.32	24.30	25.43	26.55	26.46	26.11

Computation of Tax

₹ (In lakh)

Particulars / Years	1	2	3	4	5	6	7	8	9	10
Profit before tax	29.84	29.81	31.29	32.94	34.78	36.74	38.88	40.96	41.19	40.98
Add: Book depreciation	9.88	9.88	9.88	9.88	9.88	9.88	9.88	9.88	9.88	9.88
Less: WDV depreciation	15.42	14.15	12.98	11.91	10.93	10.03	9.21	8.45	7.75	7.11
Taxable profit	24.30	25.54	28.19	30.91	33.73	36.59	39.56	42.40	43.32	43.75
Income Tax	8.26	8.68	9.58	10.51	11.47	12.44	13.44	14.41	14.72	14.87

Projected Balance Sheet

₹ (In lakh)

Particulars / Years	1	2	3	4	5	6	7	8	9	10
Liabilities										
Share Capital (D)	46.79	46.79	46.79	46.79	46.79	46.79	46.79	46.79	46.79	46.79
Reserves & Surplus (E)	21.58	42.71	64.42	86.86	110.18	134.48	159.91	186.46	212.93	239.04
Term Loans (F)	132.86	117.86	99.86	80.86	59.86	37.86	13.86	0.00	0.00	0.00
Total Liabilities D)+(E)+(F)	201.23	207.36	211.07	214.51	216.83	219.13	220.56	233.25	259.72	285.83

Assets										
Gross Fixed Assets	187.15	187.15	187.15	187.15	187.15	187.15	187.15	187.15	187.15	187.15
Less: Accm. Depreciation	9.88	19.76	29.64	39.53	49.41	59.29	69.17	79.05	88.93	98.82
Net Fixed Assets	177.27	167.39	157.51	147.62	137.74	127.86	117.98	108.10	98.22	88.33
Cash & Bank Balance	23.96	39.97	53.57	66.88	79.08	91.27	102.58	125.16	161.50	197.49

Assets										
Total Assets	201.23	207.36	211.07	214.51	216.83	219.13	220.56	233.25	259.72	285.83
Net Worth	68.37	89.50	111.21	133.65	156.96	181.26	206.70	233.25	259.71	285.82
Dept equity ratio	2.84	2.52	2.13	1.73	1.28	0.81	0.30	0.00	0.00	0.00

Projected Cash Flow:

₹(In lakh)

Particulars / Years	0	1	2	3	4	5	6	7	8	9	10
Sources											
Share Capital	46.79	-	-	-	-	-	-	-	-	-	-
Term Loan	140.36										
Profit After tax		21.58	21.13	21.71	22.44	23.32	24.30	25.43	26.55	26.46	26.11
Depreciation		9.88	9.88	9.88	9.88	9.88	9.88	9.88	9.88	9.88	9.88
Total Sources	187.15	31.46	31.01	31.59	32.32	33.20	34.18	35.32	36.43	36.34	35.99
Application											
Capital Expenditure	187.15										
Repayment of Loan	-	7.50	15.00	18.00	19.00	21.00	22.00	24.00	13.86	-	-
Total Application	187.15	7.50	15.00	18.00	19.00	21.00	22.00	24.00	13.86	-	-
Net Surplus	-	23.96	16.01	13.59	13.32	12.20	12.18	11.32	22.57	36.34	35.99
Add: Opening Balance	-	-	23.96	39.97	53.57	66.88	79.08	91.27	102.58	125.16	161.50
Closing Balance	-	23.96	39.97	53.57	66.88	79.08	91.27	102.58	125.16	161.50	197.49

Calculation of Internal Rate of Return

₹(In lakh)

Particulars / months	0	1	2	3	4	5	6	7	8	9	10
Profit after Tax		21.58	21.13	21.71	22.44	23.32	24.30	25.43	26.55	26.46	26.11
Depreciation		9.88	9.88	9.88	9.88	9.88	9.88	9.88	9.88	9.88	9.88
Interest on Term Loan		12.73	12.60	10.97	9.15	7.15	5.02	2.69	0.42	-	-
Cash outflow	(187.15)	-	-	-	-	-	-	-	-	-	-
Net Cash flow	187.15)	44.19	43.61	42.56	41.47	40.35	39.20	38.01	36.85	36.34	35.99
IRR	17.67										

NPV	62.53

Break Even Point

₹(In lakh)

Particulars / Years	1	2	3	4	5	6	7	8	9	10
Variable Expenses										
Oper. & Maintenance Exp (75%)	2.81	2.92	3.04	3.16	3.28	3.42	3.55	3.69	3.84	4.00
Sub Total (G)	2.81	2.92	3.04	3.16	3.28	3.42	3.55	3.69	3.84	4.00
Fixed Expenses										
Oper. & Maintenance Exp (25%)	0.94	0.97	1.01	1.05	1.09	1.14	1.18	1.23	1.28	1.33
Interest on Term Loan	12.73	12.60	10.97	9.15	7.15	5.02	2.69	0.42	0.00	0.00
Depreciation (H)	9.88	9.88	9.88	9.88	9.88	9.88	9.88	9.88	9.88	9.88

Particulars / Years	1	2	3	4	5	6	7	8	9	10
Sub Total (I)	23.54	23.46	21.86	20.09	18.12	16.04	13.76	11.53	11.16	11.21
Sales (J)	56.19	56.19	56.19	56.19	56.19	56.19	56.19	56.19	56.19	56.19
Contribution (K)	53.38	53.27	53.15	53.03	52.91	52.77	52.64	52.50	52.35	52.19
Break Even Point (L= G/I)	44.11%	44.04%	41.13%	37.88%	34.25%	30.39%	26.14%	21.97%	21.32%	21.48%
Cash Break Even {(I)-(H)}	25.59%	25.49%	22.54%	19.25%	15.58%	11.66%	7.37%	3.14%	2.45%	2.55%
Break Even Sales (J)*(L)	24.78	24.74	23.11	21.28	19.25	17.08	14.69	12.34	11.98	12.07

Return on Investment

₹ (In lakh)

Particulars / Years	1	2	3	4	5	6	7	8	9	10	Total
Net Profit Before Taxes	29.84	29.81	31.29	32.94	34.78	36.74	38.88	40.96	41.19	40.98	327.58
Net Worth	68.37	89.50	111.21	133.65	156.96	181.26	206.70	233.25	259.71	285.82	1658.07
											19.76%

Debt Service Coverage Ratio

₹ (In lakh)

Particulars / Years	1	2	3	4	5	6	7	8	9	10	Total
Cash Inflow											
Profit after Tax	21.58	21.13	21.71	22.44	23.32	24.30	25.43	26.55	26.46	26.11	186.46
Depreciation	9.88	9.88	9.88	9.88	9.88	9.88	9.88	9.88	9.88	9.88	79.05
Interest on Term Loan	12.73	12.60	10.97	9.15	7.15	5.02	2.69	0.42	0.00	0.00	60.73
Total (M)	44.19	43.61	42.56	41.47	40.35	39.20	38.01	36.85	36.34	35.99	326.24

Debt

Interest on Term Loan	12.73	12.60	10.97	9.15	7.15	5.02	2.69	0.42	0.00	0.00	60.73
Repayment of Term Loan	7.50	15.00	18.00	19.00	21.00	22.00	24.00	13.86	0.00	0.00	140.36
Total (N)	20.23	27.60	28.97	28.15	28.15	27.02	26.69	14.28	0.00	0.00	201.09
Average DSCR (M/N)	1.62										

Annexure 6 Details of procurement and implementation plan with schedule

S.No.	Activities	Weeks											
		1	2	3	4	5	6	7	8	9	10	11	12
1	Foundation & civil work												
2	Supply, Erection & commissioning of the Generator set												
3	Cabling & electrical panel fitting												
4	Testing and trial												
5	On site operator training												

Day wise break up of shut down period of Plant

S.No	Activity	Day									
		1	2	3	4	5	6	7	8	9	10
1	Cabling and Panels connections										
2	steam lines laying and connecting with main										
3	Erection of the Generator										
4	Instrumentation										
5	Commissioning										
6	Trial Runs										

Annexure 7 Details of technology/equipment and service providers

Equipment details	*Source of technology*	*Service/technology providers*
Natural Gas Co Generation		***Green Power International (P) Ltd.*** E – 12/A, Sector – 63, Noida – 201 301 (U.P.), India Contact Person: Mr. Swapnil Dixit Mobile: +91-9960285152 FAX: +91-120-4655 499 email:swapnil.dixit@greenpowerintl.com visit us- www.greenpowerintl.com

Annexure 8 Quotations or Techno-commercial bids for new technology /equipment

MWM
Energy. Efficiency. Environment.

GREEN POWER INTERNATIONAL (P) LTD

Proposal for Natural Gas Genset based Captive Power Generation Plant

PROPOSAL NO: NG/259-A/2010/PR
DATE: October 25, 2010

TO: Zenith Energy
10-5-6/B, My Home Plaza
Masabtank
Hyderabad- 500 028
Andhra Pradesh , India
Phone No: 040 23376630 /23376631 Ext: 206
Fax: 040 23322517

PROJECT: 1 No. X TCG 2016 V12 C (1 X 600KWe)
@ 415V Natural Gas Based CPP

Submitted by:
Green Power International (P) Ltd.
E – 12/A, Sector – 63,
Noida – 201 301 (U.P.),
India

Contact Person: Mr. Swapnil Dixit
Mobile: +91-9960285152
FAX: +91-120-4655 499
email:swapnil.dixit@greenpowerintl.com
visit us- www.greenpowerintl.com

GREEN POWER INTERNATIONAL (P) LTD

Kind Attention ***Mr. Krishna***

Dear Sir,

This has reference to the above-referred subject and discussion had with **Mr. Swapnil Dixit** for your requirement of Natural Gas Based Gensets. At the outset we wish to thank you for giving us an opportunity to quote for the said project. As desired, we are enclosing herewith our complete proposal in accordance with your specified requirements.

The Company:

Green Power International Pvt. Ltd. was established in early 2002 in close cooperation with MWM GmbH (formerly Deutz Power System GmbH). The combination of the technical competence of MWM GmbH with the market know-how of the Indian partner company Green Power International has proven to be highly successful.

The core competencies of GPIPL include the design of plants, engineering, plant construction, operation, and maintenance of the complete plants.
As a well-established company with extensive experience in machine and plant engineering, GPIPL offers each customer an innovative solution concept that is tailored to the customer's individual requirements.
We have already commissioned our Natural Gas Based Gensets all over India with complete turnkey projects for most of them, at many places, which are performing satisfactorily. Now we are serving our valuable customers round the clock with a strong team of over 400+ Technical and Service Engineers, specialized in Power Generation Industry and thru complete O & M Contracts of the power plant.

Majority of these projects are Cogeneration Based Captive Power Plants with Chilling / Air-Conditioning / Hot Water Recovery from Engine Jacket Water Heat and Steam from the heat of Engine Exhaust Gases. At present we are having 150+ installations all over India with a capacity of more than 250 MWs. (Please refer our reference list enclosed along with the offer).

MWM GmbH (formerly Deutz Power Systems):

MWM GmbH (formerly DEUTZ Power Systems) in Mannheim, Germany, has been one of the world's leading system providers of highly efficient and environmentally-friendly complete
plants for decentralized energy supply with gas and diesel engines. The company stands for the reliable, uninterrupted provision of electricity, heat, and cooling at all times and at any location.

Corporate Office: E – 12 / A, Sector – 63, Noida -201301, Telephone: +91-120-4655400-444, Fax: +91-120-4655499
Email: gpil@greenpowerintl.com, Website: www.greenpowerintl.com

GREEN POWER INTERNATIONAL (P) LTD

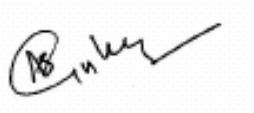
Our Power solution:

We are pleased to offer you One unit of gas engine of 800 KWe .The machine offered to you is a state-of-art, fuel-efficient gas engine with German technology and shall lead to a much faster payback compared to other competitors. In case you go for Waste Heat Recovery from Exhaust Gas and Jacket Water the overall system efficiency is more than 85%.

We hope the above is in line with your requirement. We are eager to work with your esteemed organization and remain at your disposal for any further information.

Thanking you and assuring you of our best services at all times.
Yours faithfully

For *Green Power International Pvt. Ltd.*



For further details contact:

Mr. Swapnil Dixit (Sr. Manager – Sales & Marketing)

Mobile: 09960285152

Email Id: swapnil.dixit@greenpowerintl.com

MWM

GREEN POWER INTERNATIONAL (P) LTD

PRICE SCHEDULE

Supply of 1 x TCG 2016 V12 (1 X 600 kWe) capacity Natural Gas based Genset, auxiliaries & Technical Services for the proposed Combined Heat and Power Plant project.

Part- I Imported Scope from MWM, Germany

Description	Total Price
1 No. 600 KWel Gas Genset (TCG 2016 V12) as per enclosed Scope of Supply on CFR Mumbai / Nhava Seva Port basis.	€ 181,000.00 (Euros One Hundred Eighty One Thousand Only)

Part-II Local Scope from Green Power International Pvt. Ltd.

Description	Price
Genset related auxiliaries as per the enclosed Scope of Supplies for 1 X 600 KWe	Rs 61,00,000.00 (Rs Sixty One Lacs Only)

Part-III Engineering Service Charge:

Description	Price
Service Charge Towards design and engineering for Electromechanical works and commissioning service for captive power plant	Rs. 8,50,000.00 (Rupees Eight Lac Fifty Thousand Only)

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NAME OF FOREIGN SUPPLIER / COUNTRY & INVOICE No : **M/S Importer Name**

INVOICE NO. & DATE : Seller High Seas Sale Inv. No. DTD

NAME OF CARRIER : .....

AIR WAY BILL : .....

CONSIDERATION : Rs (HSS Invoice Value)

PAYMENT

The Buyers shall pay to the sellers full sale price of the goods referred in Annexure A.

DELIVERY

The Seller shall transfer title and all rights in respect of the goods to the buyer by endorsing the above Airway bill and other negotiable documents in favour of the buyers.

Duties and Taxes

1. The buyer shall pay to the concerned authorities all custom duties, fines, penalties, demurrage/handling/transportation and other charges incidental to loading, stacking, handling and clearance of the said goods through the customs and port authorities.
2. The buyers shall pay the octroi charges, if any, to the concerned authorities.
3. The buyers shall make their own arrangement for clearance of the goods through customs and for taking delivery of the same from the port authorities.
4. The buyers shall pay all the taxes, whether central or state, including Sales Tax notwithstanding the fact that goods purchased on high sea sales basis are not liable for taxes in the event of these being demanded by the concerned authorities.

Other Terms & Conditions

The Buyer shall indemnify the seller in full against any demand for payment of any dues by any authority and make necessary arrangements to meet such demands:

A) The Sellers shall not be responsible for any loss or damage for the goods after the High Sea Sales Contract is executed or while the goods are in transit after the high sea sale.

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B) The Buyers undertake to forward to the seller the Exchange Control Copy of the Bill of Entry under which they would clear the goods after getting the same duly authenticated by the customs authorities within 7 days of the custom clearance.

C) The High Sea Sale shall be subject to Force Majeure

D) The Buyer hereby confirm that this high sea sale contract once signed by both the parties to this contract would be irrevocable until such acts as specified hereinabove are completed.

E) This agreement is subject to Delhi Jurisdiction.

In witness thereof the parties hereto set and subscribe their respective hands below under their respective seals at Delhi on this day .....

Seller Detail	Buyer Detail
I.E.C NO: 0503005134	I.E.C NO:
PAN NO:	PAN NO:
	EXCISE NO:

Corporate Office: E – 12 / A, Sector – 63, Noida -201301, Telephone: +91-120-4655400-444, Fax: +91-120-4655499
Email: gpil@greenpowerintl.com, Website: www.greenpowerintl.com

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(Ministry of Power, Government of India)
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Ph.: +91 – 11 – 26179699 (5 Lines), Fax: +91 – 11 – 26178352
Websites: www.bee-india.nic.in, www.energymanagertraining.com

Zenith Energy Services Pvt. Ltd
10-5-6/B, My Home Plaza, Masab
Tank HYDERABAD, AP 500 028
Phone: 040 23376630, 31,
Fax No.040 23322517
Website: www.zenithenergy.com

India SME Technology Services Ltd
DFC Building, Plot No.37-38,
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Tel: +91-11-28525534, Fax: +91-11-28525535
Website: www.techsmall.com