CLEAN DEVELOPMENT MECHANISM
PROJECT DESIGN DOCUMENT FORM (CDM-SSC-PDD)
Version 03 - in effect as of: 22 December 2006

CONTENTS

Revision history of this document

Version Number	Date	Description and reason of revision
01	21 January 2003	Initial adoption
02	8 July 2005	1. The Board agreed to revise the CDM SSC PDD to reflect guidance and clarifications provided by the Board since version 01 of this document. 2. As a consequence, the guidelines for completing CDM SSC PDD have been revised accordingly to version 2. The latest version can be found at <http://cdm.unfccc.int/Reference/Documents>.
03	22 December 2006	3. The Board agreed to revise the CDM project design document for small-scale activities (CDM-SSC-PDD), taking into account CDM-PDD and CDM-NM.

SECTION A. General description of small-scale project activity

A.1 Title of the small-scale project activity:

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Title- Renewable Energy Project in distilleries of Sir Shadi Lal Enterprise Ltd.
Version- 01
Date- 10/01/2007

A.2. Description of the small-scale project activity:

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The project activity primarily aims at setting up of 2MW biogas power project at the two distillery units of Sir Shadi Lal Enterprise Ltd (SSLE) in Uttar Pradesh each of 1MW capacity. This power project would generate electricity utilizing biogas, generated during effluent treatment plant installed for treatment of distillery wastes. The electricity from the power plant generated would cater internal power requirements of the manufacturing unit.

Sir Shadi Lal Enterprise Ltd has two distilleries – Shamli Distillery and Pilkhani Distillery.

Shamli Distillery is planning to set up 1MW Captive generation plant using the biogas generated from effluent treatment of the distillery with 25 KLPD capacity. The plant will be having 12TPH boiler generating steam at 45 bar, 415 Deg C along with an extraction cum condensing turbine of 1 MW generating power at 415 volts.

Pilkhani Distillery is planning to set up 1MW Captive generation plant using the biogas generated from effluent treatment of the distillery with 36 KLPD capacity. The plant will be having 12TPH boiler generating steam at 45 bar, 415 Deg C along with a backpressure turbine of 1 MW generating power at 415 volts.

Project's Contribution to sustainable development

As per the interim approval guidelines for CDM projects, Ministry of Environment and Forests, Govt. of India, the project meets the stipulation of sustainable development indicators i.e., social well being, economic well being, environmental well being and technological well being.

- Social well-being

- The proposed CDM project activity enables the distillery unit to be self sufficient in energy front by using waste energy and thus allows the state electricity to provide electricity to other important activities in the state. Electricity is one of the basic amenities always in demand due to lack of supply, hence the project contributes towards meeting the basic needs of the people in the state and thus leading to improvement of quality of life of the people in the state.
- The project activity offers direct and indirect employment to the local community during construction of the project activity.
- The project will employ experienced engineers to operate the equipments and machinery of the power generation plant.

-Economic well-being

- The project will bring in economic benefits for the company considering the related benefits of replacement of equivalent grid electricity and diesel used in the manufacturing unit with renewable source of energy. The use of domestically available biogas as an energy resource helps to conserve non- renewable source of energy.
- Thus the project apart from creating local employment opportunities helps in conserving the non-renewable energy utilizing renewable energy sources.

- Environmental well-being

- The project activity would contribute in reducing emissions of major greenhouse house gas and will help improving air and water quality at local levels.
- The proposed project would utilize biogas for generation of electricity for its in-house power requirements. The biogas utilized is generated from anaerobic treatment of distillery wastewater. Displacement of grid electricity with renewable source of energy will help in mitigating Carbon di-oxide emissions.
- There is further reduction of GHG emission due replacement of diesel with electricity generated from Biogas

-Technological well-being

- The CDM project activity encourages other similar facilities irrespective of sector, to adopt technologies for wastewater treatment that have benefits of avoidance of GHG emissions, avoidance of fossil fuel, avoidance of reliability on grid and reduction of environmental impacts.

Each of the above indicators has been studied in the context of the project activity to ensure that the project activity contributes to the sustainable development.

A.3. Project participants:

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Name of the Party involved (*) ((host) indicates a host Party)	Private and/or public entity(ies) Project participants (*) (as applicable)	Kindly indicate if the Party involved wishes to be considered as project participant (Yes/No)
Ministry of Environment and Forests (MoEF), Government of India	Sir Shadi Lal Enterprise Ltd (Private entity, project participant)	No

A.4. Technical description of the small-scale project activity:

CDM – Executive Board

A.4.1. Location of the small-scale project activity:

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A.4.1.1. Host Party(ies):

>>
India

A.4.1.2. Region/State/Province etc.:

>>
Uttar Pradesh

A.4.1.3. City/Town/Community etc:

>>
Pilkhali Distillery:
District - Saharanpur, Region - Pilkhani

Shamli Distillery:
District - Muzaffarnagar, Region - Shamli

A.4.1.4. Details of physical location, including information allowing the unique identification of this small-scale project activity :

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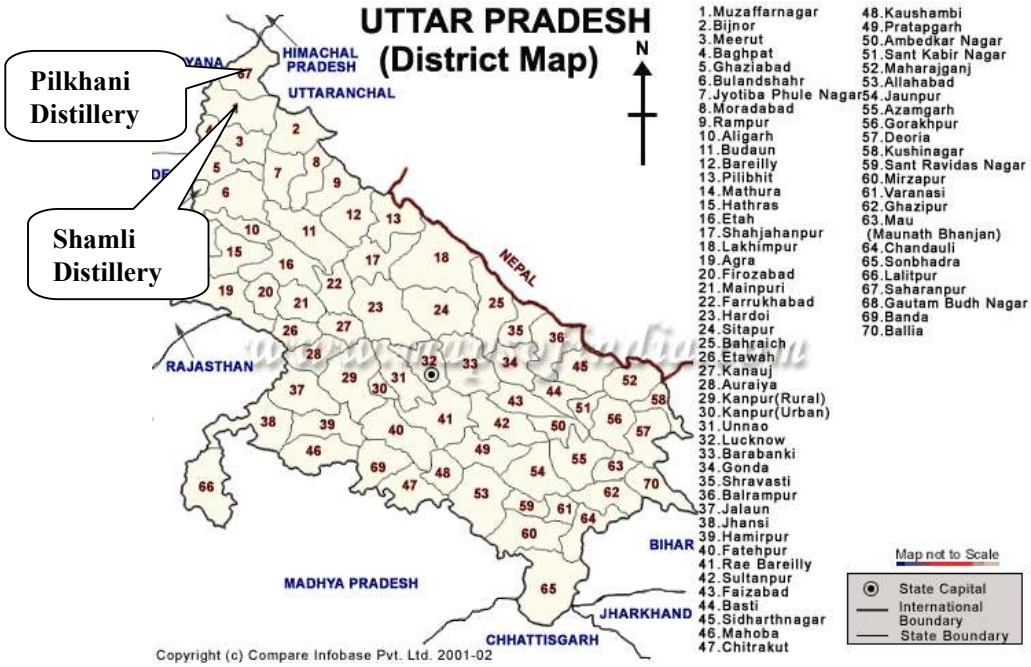
The project is located at different locations as given below:

Shamli Distillery unit is located at Shamli, Dist. Muzaffarnagar in the state of U.P. Muzaffarnagar is located at northern part of Uttar Pradesh. The district of Muzaffarnagar forms a portion of division Saharanpur, and situated in the DOAB of the Ganges and the Jamuna, between the districts of Meerut on the South and Saharanpur on the North. On the west, the Jamuna separates it from the Panipat and Thaneswar tahsil of the Karnal district of Haryana; and on the east the river Ganges forms the boundary between this district and the Bijnor tehsil of the district of same name. It is roughly rectangular in shape, lying between north latitude 29º 11' 30" and 29º 45' 15" and east longitude 77º 3' 45" and 78º 7'. The district is well connected by road and railway network. National Higway-58 passes through Muzaffarnagar city. Upper Ganga & Lower Yamuna canal lie in this district.

Pilkhani Distillery is located at Pilkhani, Dist. Saharanpur (U.P.). Saharanpur forms the most northerly position of the Doab land which stretches between the holy rivers of the Ganges and the Yamuna, the Shivalik hills rise above it on the northern frontier. As regards its physical features, the north and the north east of the district is surrounded by Shivalik hills and separates it from the Dehradun district in the recently created state of Uttranchal. The river Yamuna forms its boundary in the west, which separates it from Karnal and Yamunanagar districts of Haryana. In the East lies the district of Haridwar which was the part of district Saharanpur before 1989 and in the south lies the district Muzafarnagar. The district is in a rectangular shape and it lies between 29 ^{o} 34 ‘45 ‘‘and 30 ^{o} 21 ‘30 " north latitude and 77 ^{o} 9' and 78 ^{o} 14’ 45 " east

longitude. This distillery unit is well connected by road and train. The location of the project activity is illustrated in the maps below:

Location of State Uttar Pradesh in India



Location of the Power Projects

A.4.2. Type and category(ies) and technology/measure of the small-scale project activity:

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The project activity is categorized under Sectoral Scope 01 "Energy Industries" (renewable / non-renewable sources).

The project falls under the following category:

Type I C – Thermal Energy for the user

The project activity involves installation of 2MW power plant based on biogas generated during wastewater treatment of effluent at the distillery units. The biogas would be utilized for heat and power systems that would displace grid electricity and diesel consumption in the manufacturing unit. The project activity falls within the small-scale rating as the generating capacity is 2MW, i.e. below the 15 MW as outlined AMS I.C, version 09, 23rd December 2006.

Technology employed:

The proposed project is planning to install a 2MW power plant based on biogas obtained wastewater treatment process.

The basic technology involved here is that the biogas captured from waste treatment process is combusted in boilers to generate steam that would suffice for the thermal requirements of the manufacturing unit. Some amount of steam will be fed into TG sets to generate electricity. This electricity generated would displace the electricity imported from Grid prior to the project and also replace diesel oil that had been used in the manufacturing unit.

Shamli Distillery is generating 15,000 M^3/day of Biogas from anaerobic digestor system. Shamli Distillery is planning to install 1.00 MW extraction cum condensing turbine. This turbine needs 0.5 tph of steam in condensing zone. Process plant needs 4.62 tph of steam. Hence this plant needs 5.12 tph of steam. This biogas will generate around 3.9 tph of steam. The balance 1.22 tph steam will be generated by bagasse / cane trash.

Design Details are given below:

Distillery Capacity	: 25 KLPD
Spent Wash Generation per day	: 300 KL
Spent was generated per hour	: 12.5 KL
COD of Spent Wash	: 1, 30,000 ppm
Bio Gas generated per day	: 15,000 M^3/day
Steam generation per hour	: 3.9 tph
Steam for Process	: 4.62 tph
Steam for condensing	: 0.5 tph
Total steam requirement	: 5.12 tph

Balance steam from bagasse : 5.12- 3.9=1.22 tph

Steam generated by biogas is more than 78%, and the balance of steam of less than 22% is generated by Bagasse and cane trash.

Pilkhani Distillery is generating Present anaerobic digestor system is generating 21,624 M^3/day of Biogas. This biogas will generate around 5.6 tph of steam. Distillery needs 7.4 tph of steam. The balance 1.8 tph steam will be generated by bagasse / cane trash.

Distillery Capacity : 36 KLPD
Spent Wash Generation per day : 432 KL
COD of Spent Wash : 1,30,000 ppm
Bio Gas generated per day : 21,624 M^3/day
Steam generation per hour : 5.6 tph
Steam for Process : 7.4 tph
Balance steam from bagasse : 7.4- 5.6=1.8 tph

Steam Generated by Biogas is more than 75%, and the balance of steam of less than 25% is generated by bagasse and cane trash.

A.4.3 Estimated amount of emission reductions over the chosen crediting period:

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The project proponent has chosen a fixed renewable crediting period of 10years. The emission reductions from the project activity are given below:

Years	Annual estimation of emission reductions in tonnes of CO2 e
November 2006	2,104
2007	12,625
2008	12,625
2009	12,625
2010	12,625
2011	12,625
2012	12,625
2013	12,625
2014	12,625
2015	12,625
2016	10,521
Total estimated reductions (tones of CO2 e)	**1,26,250**
Total number of crediting years	**10y-0m**

Annual average over the crediting period of estimated reductions (tones of CO2 e)	**12,625**

A.4.4. Public funding of the small-scale project activity:

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No public funding is involved in the project financing.

A.4.5. Confirmation that the small-scale project activity is not a debundled component of a large scale project activity:

As per the Appendix C, paragraph 2 of the latest version of Simplified Modalities and Procedures for Small-Scale CDM project activities states:

A proposed small-scale project activity shall be deemed to be a debundled component of a large project activity if there is a registered small-scale CDM project activity or an application to register another small-scale CDM project activity:

- With the same project participants;
- In the same project category and technology/measure; and
- Registered within the previous 2 years; and
- Whose project boundary is within 1 km of the project boundary of the proposed small-scale activity at the closest point.

As there is no large scale or small scale registered CDM project with the same project category, project participants and technology/measure within 1km of project boundary, it is confirmed that the small scale project activity is not a de-bundled component.

SECTION B. Application of a baseline and monitoring methodology

B.1. Title and reference of the approved baseline and monitoring methodology applied to the small-scale project activity:

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Category: Type I – Renewable Energy Projects
Sub Category: Type I.C. Thermal energy for the user

The reference has been taken from the methodology applicable for small-scale CDM project activity. AMS I. C. Version 09, 23rd December 2006.

B.2 Justification of the choice of the project category:

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This methodology is applicable as per definition in the Annex B of the simplified methodologies for selected small-scale CDM project activity categories, Type I.C: Thermal Energy for the User.

The Methodology	The proposed project activity	Justification
This category comprises renewable energy technologies that supply individual households or users with thermal energy that displaces fossil fuels. Examples include solar thermal water heaters and dryers, solar cookers, energy derived from renewable biomass for water heating, space heating, or drying, and other technologies that provide thermal energy that displaces fossil fuel. Biomass-based cogeneration systems that produce heat and electricity for use on-site are included in this category.	The project activity will be producing heat and electricity by utilizing biogas. The Biogas captured from waste treatment process is combusted in boilers to generate steam that would suffice for the thermal requirements of the manufacturing unit. Some amount of steam will be fed into TG sets to generate electricity. This electricity generated would displace the electricity imported from Grid prior to the project and also replace diesel oil that had been used in the manufacturing unit.	YES
Where generation capacity is specified by the manufacture, it shall be less than 15MW	The project activity capacity as specified by the manufacturer is 2MW which is below 15 MW and therefore eligible	YES

B.3. Description of the project boundary:

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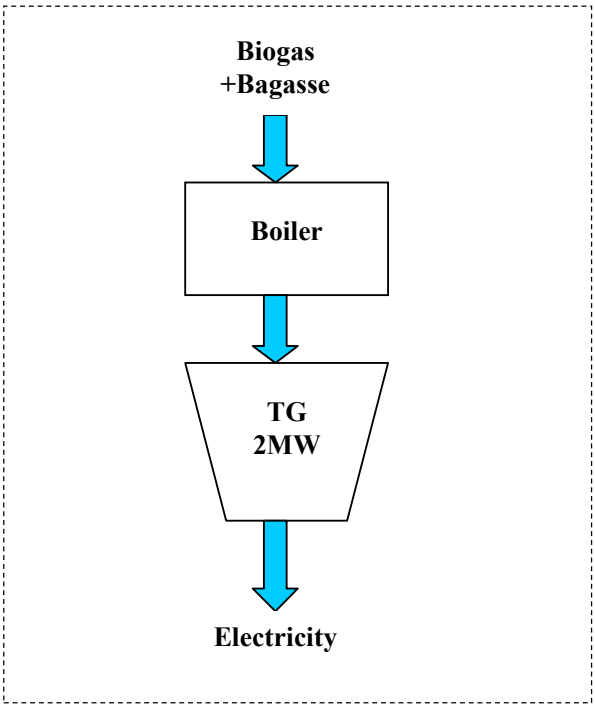
As per the guidelines mentioned in Type 1.C of the simplified modalities and procedures for small-scale CDM project activities, project boundary encompasses the physical and geographical site of the renewable generation source.

For the proposed project the project boundary is from the point of entry of biogas and bagasse into the boiler thereafter into the turbine for steam and power generation. The project boundary diagram is given as follows where the project boundary is indicated in dotted lines:



B.4. Description of baseline and its development:

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Baseline for projects under Type I.C has been detailed in paragraph 7. It states "For renewable energy technologies that displace electricity the simplified baseline is the electricity consumption times the relevant emission factor calculated as described in category I.D". It is calculated in a transparent and conservative manner as:

(a) The average of the "*approximate operating margin*" and the "*build margin*", where:

(i) The "approximate operating margin" is the weighted average emissions (in kg CO2equ/kWh) of all generating sources serving the system, excluding hydro, geothermal, wind, low-cost biomass, nuclear and solar generation;

(ii) The "build margin" is the weighted average emissions (in kg CO2equ/kWh) of recent capacity additions to the system, based on the most recent information available on plants already built for sample group *m* at the time of PDD submission. The sample group *m* consists of either the five power plants that have been built most recently or the power plant capacity additions in the electricity system that comprise 20% of the system generation (in MWh) and that have been built most recently. Project participants should use from these two options that sample group that comprises the larger annual generation. Power plant capacity additions registered as CDM project activities should be excluded from the sample group *m*. If 20% falls on part capacity of a plant, that plant is included in the calculation.

The detailed description of the baseline has been provided in the Annex 3

B.5. Description of how the anthropogenic emissions of GHG by sources are reduced below those that would have occurred in the absence of the registered small-scale CDM project activity:

The anthropogenic GHG emissions by sources are reduced below what would have occurred in the absence of the proposed CDM project. In the absence of the project activity the power requirements in the manufacturing unit is met by importing electricity from the Grid as well as from diesel consumption. Thus by substituting the power from the grid with power from biogas, the emissions associated with fossil fuels are avoided.

Additionality

The following paragraphs have been detail on project additionality.

In accordance with the simplified modalities and procedures for small-scale CDM project activities, a simplified baseline and monitoring methodology listed in Appendix B may be used if project participants can demonstrate that the project activity would otherwise not be implemented due to the existence of one or more barrier(s) listed in attachment A of Appendix B. Similarly, for the identified CDM project, following barriers have been overcome during project planning and execution:

a) Investment Barrier:

SSLE has adopted the technology that involves controlled decomposition of waste and utilizes generated biogas for power generation. In support of which it required more on the part of SSLE in terms of investments, managerial intervention and operation and maintenance controls of the technology. It also has to invest in other related facilities such as laboratory infrastructure at the site for the analysis of wastes, production & control of bacteria for the digester etc. The project activity also involves power generation using the biogas in the decomposition plant and so required additional investments in turbine, boiler, allied systems, required controls and suitably skilled human resource.

Before the commissioning of the power plant proper training would be provided to the workers and experienced personnel would be recruited which would be require further investment to ensure efficient operation of machinery.

SSLE is a distillery unit with core business in alcohol manufacturing. To execute implementation of the proposed wastewater treatment scheme, the management of SSLE had to overcome obstacles in streamlining various aspects of project planning and execution. The distillery had to hire an expert to conduct feasibility study emphasizing the technological options and equipment selection, equipment procurement and test runs, operation and maintenance.

A financially more viable option would have led to higher GHG emissions however SSLE decided to invest in the project primarily due to the following reasons:
• The project was environmentally positive
• The project became investible after accounting for benefits from carbon credits

The CDM fund for the project was initially considered to cover the project risk related to the uncertainty in biogas production, which would indirectly affect the energy generation. The anaerobic digestion process is a very complex process and the factors affecting this process are temperature and changes in feed material. Variations in temperature could affect biogas production. Biogas can also get affected by the fluctuations in raw material supply to the distilleries. The CDM fund is critical in lessening the risks related with the project.

b) Technological Barrier:

The Pilkhani and Shamli Distilleries previously were utilizing diesel and electricity from grid to meet the internal requirements of power and thermal energy. Presently these distilleries are shifting towards generating power from biogas.

They didn't have any prior experience for operating such processes. The project activity needs in-depth understanding of the process and its controls, which requires continuous supervision and involvement of very high degree of technological intervention.

The project uses biogas generated from anaerobic digester along with bagasse to generate steam and electricity. The boiler used for this project is of multiple fuel capabilities. Due to variations in characteristics of different fuels fired in the boilers may lead to heat release rate variations which can affect the steam generation. There also can be fluctuations in the biomethanation process due to temperature variations which would affect the biogas production and in turn affect the power and generation.

Operational risk also involves need for more safety precautions due to usage of gas, skilled manpower to operate the system due to gas handling, also the entire system of distilleries operates only on gas & hence there is problem of stoppage of operation of distilleries in case of any disruption in gas supply thereby resulting in significant production losses to the company.

Factors like relatively smaller quantum of biogas generation, inconsistency in biogas availability, which make it difficult for the project proponents to use it as a reliable fuel source. These technological risks have been anticipated by project proponents which would covered by the funding expected through CDM.

c) Barrier due to prevailing practice:

The proposed project is planning to install a 2MW power plant based on Biogas generated from effluent treatment plant at distilleries. The biogas generated would be utilized for in-house thermal energy requirements as well as for power generation, which would displace Grid electricity and diesel consumption at the manufacturing plant.

There are about 44 distilleries[1] in entire Uttar Pradesh State. The Biomethanation technology is not yet prevalent in Uttar Pradesh State because there had only six installed biogas based power projects in Distilleries.

SSLE was reluctant to go ahead with the project activity due to its low penetration in the industry. The initiative adopted was a proactive step towards green house gas reductions. From this it is clear that the project activity was not a common prevailing practice and is slowly picking up after successful implementation of similar kind of project in these industries. The technical expertise to operate the plant requires lot of investment so power import from fossil fuel fired Grid is an economically feasible option. This determines that the project activity is additional. The project activity has replication potential in similar cases in India.

d) Other Barriers:

Production Risk

SSLE has planned to install a 2MW biogas based power plant in order to generate power to fulfil the internal needs of power. The fluctuations in supply of raw material utilized in the distilleries would affect the effluent generated that in turn would affect the biogas generated. The effluent quantity that would be treated in the ETP would depend on the production targets of the distilleries. Variations in the quality of wastewater generated will become a bottleneck for the power plant that would be utilizing biogas generated from effluent treatment process for power generation.

The operation of the manufacturing plant depends on the biogas generation. Therefore profitability of plant depends on biogas generation. Variations in quality and quantity of production of effluent produced would lead to fluctuations in production of the plant. Thus this project activity would involve uncertainties regarding the production.

Managerial Risk

[1] http://www.sugarasia.com/sugarasia/distilleries.jsp?state=Uttar%20Pradesh

For proper operation of the power plant based on Biogas well experienced engineers is required. The plant operating and maintenance personnel must be trained before the plant commissioning. The objective of the training programme must be to equip each individual to carry out his particular function with skill and confidence. The appointment of skilled individuals and implementation of proper training programme would require lot of investment which would not be an economically feasible option.

Impact of CDM registration

The registration of this CDM project activity, will contribute to overcome all the perceived risks and barriers. Technological, production and investment barriers will all be significantly mitigated on account of the additional revenue generation from the sale of carbon credits. This would also bring more solidity to the investment.

As mentioned in earlier steps that the project is additional and the anthropogenic emissions of GHGs produced from sources will be reduced below the levels of emissions that occurred in absence of the project activity. But the risks and costs of this project is much higher than its benefits. The registration of the CDM project will alleviate the identified barriers by providing additional revenue to the plant by sale of emission reductions.

Thus the project cannot proceed on a business-as-usual basis.

B.6. Emission reductions:

B.6.1. Explanation of methodological choices:

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Baseline Emissions:

The baseline emissions are calculated from the following equations:

Emissions from power Consumption = Amount of Electricity Consumption (MU) X Grid Emission Factor (tCO2/GWh)

Emission due to Diesel Consumption = Electricity generated from Diesel (MWh) X Emission Factor for Diesel generator systems

Project Emissions:

The project activity emissions are considered to be negligible.

Leakage:

Leakage is not considered because no energy generating equipment is transferred from another activity nor existing equipment is transferred to another activity.

B.6.2. Data and parameters that are available at validation:

(Copy this table for each data and parameter)

Data / Parameter:	**Emission Factor for diesel generator systems**
Data unit:	(tCO2/MWh)
Description:	-
Source of data used:	AMS ID, Version-9, Table I.D.1(Emission factors for diesel generator systems in $kgCO_{2equ}$/kWh for three different levels of load factor)
Value applied:	0.8
Justification of the choice of data or description of measurement methods and procedures actually applied :	This data is used for calculation for emission due to diesel consumption.
Any comment:	-

Data / Parameter:	**Grid Emission Factor**
Data unit:	(tCO2/GWh)
Description:	EF_y
Source of data used:	Central Electricity Authority Reports
Value applied:	912
Justification of the choice of data or description of measurement methods and procedures actually applied :	This data is used for calculation for emission due to power consumption. The baseline emission factor $EF_{,y}$ is calculated as the weighted average of the Operating Margin emission factor ($EF_{OM,\,y}$) and the Build Margin emission factor (*EFBM,y*)
Any comment:	-

B.6.3 Ex-ante calculation of emission reductions:

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Baseline Emissions:

The baseline emissions are calculated from the following equations:

Emissions from power Consumption = Amount of Electricity Consumption (MU) X Grid Emission Factor (tCO2/GWh)

= 7.99 X 912 = 7286.88 tCO2e

Emission due to Diesel Consumption = Electricity generated from Diesel (MWh) X Emission Factor for Diesel generator systems

= 6672.76 X 0.8 = 5338.208 tCO2e

Total Baseline emissions = 7286.88 + 5338.208 = 12,625.08 tCO2e

Project Emissions:

The project activity emissions are considered to be negligible.

Leakage:

Leakage is not considered because no energy generating equipment is transferred from another activity nor existing equipment is transferred to another activity.

Baseline Emissions for a year y **(BE_y) =** 12,625 tCO2e
Project Emissions for year y (PE_y) = 0
Leakage for year y (LE_y) = 0

$ER_y = BE_y - PE_y - LE_y$

ER_y = 12,625 – 0 – 0 = 12,625 tCO2e

B.6.4 Summary of the ex-ante estimation of emission reductions:

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Year	Project activity Emissions (tCO_2/yr)	Baseline Emissions (tCO_2/yr)	Emission Reductions (tCO_2/yr)
November 2006	0	2,104	2,104
2007	0	12,625	12,625
2008	0	12,625	12,625
2009	0	12,625	12,625
2010	0	12,625	12,625
2011	0	12,625	12,625
2012	0	12,625	12,625
2013	0	12,625	12,625
2014	0	12,625	12,625
2015	0	12,625	12,625
2016	0	10,521	10,521

B.7 Application of a monitoring methodology and description of the monitoring plan:

B.7.1 Data and parameters monitored:

(Copy this table for each data and parameter)	
Data / Parameter:	**Amount of Grid Electricity consumption**
Data unit:	MU
Description:	-
Source of data to be used:	Monthly Electricity Bills
Value of data	7.99
Description of measurement methods and procedures to be applied:	This will be measured from the data recorded in the logbooks on a continuous basis. The data will be archived either electronically or in papers and will be available upto two years after the crediting period.
QA/QC procedures to be applied:	These data is monitored in normal plant operation, which already has QA/QC procedure in place.
Any comment:	-

Data / Parameter:	**Electricity generated from Diesel**
Data unit:	MWh
Description:	-
Source of data to be used:	Energy meters are installed to measure the electricity generated.
Value of data	6672.76
Description of measurement methods and procedures to be applied:	This will be measured from the data recorded in the logbooks on a continuous basis. The data will be archived either electronically or in papers and will be available up to two years after the crediting period.
QA/QC procedures to be applied:	The electricity generation is measured by the energy meters. The meter is calibrated and regularly inspected by SSLE.
Any comment:	-

B.7.2 Description of the monitoring plan:

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SSLE has a well-defined mechanism for monitoring the emission reductions. It has system in place wherein all the inputs to the complex including raw materials, supplies, components, accessories etc. would be recorded and archived. The operating parameters are measured regularly and recorded in appropriate record books. The records and electronic data would be maintained and validated regularly by SSLE's internal auditors.

The primary responsibility for the data measurement as per the monitoring plan will be carried out by the Plant Management and necessary reports will be generated for the management i.e.

Board of Directors or its committee for review. The management will review the data collected and also suggest corrective actions wherever required. Management will also examine the internal audit reports independent of the Plant manager's report. Management will in particular take note of deviations in data over the norms and monitor that the corrective actions have resulted in adherence to the standards. It will also be the responsibility of Plant Manager to report to the management about compliance with management's instructions on corrective actions. The company will introduce an internal audit system for the GHG compliance.

B.8 Date of completion of the application of the baseline and monitoring methodology and the name of the responsible person(s)/entity(ies)

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Date of Completion:

Name of the person/entity determining the baseline: Sir Shadi Lal Enterprise Ltd

The Detailed contact address of the above entity is given in Annex 1.

SECTION C. Duration of the project activity / crediting period

C.1 Duration of the project activity:

C.1.1. Starting date of the project activity:

>>
15/10/2005

C.1.2. Expected operational lifetime of the project activity:

>>
30y-0m

C.2 Choice of the crediting period and related information:

C.2.1. Renewable crediting period

C.2.1.1. Starting date of the first crediting period:

>>
Not Applicable

C.2.1.2. Length of the first crediting period:

>>
Not Applicable

C.2.2. Fixed crediting period:

C.2.2.1. Starting date:

>>
01/11/2006 (or the date of registration of the project)

C.2.2.2. Length:

>>
10y-0m

SECTION D. Environmental impacts

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D.1. If required by the host Party, documentation on the analysis of the environmental impacts of the project activity:

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The project being a renewable energy based power project it does not fall under the purview of the Environmental Impact Assessment (EIA) notification of the Ministry of Environment and Forest, Government of India.

The environmental impacts of the project activity are given as follows:

Air Quality:

The project activity would contribute in reducing emissions of a major greenhouse house. The Project activity involves installation of a power plant based on biogas which would displace Grid electricity and Diesel consumption within the manufacturing unit.

Displacement of Grid electricity with renewable source of Energy will help in mitigating Carbon di-oxide emissions. There is further reduction of GHG emission due replacement of Diesel oil with electricity generated from Biogas

Water Quality:

There are no negative effects of the project activity on the ground water or surface water body.

Noise Pollution:

The noise generating equipments in the plant are turbines, boilers, cooling towers and other pumps and blowers. These equipments are provided with silencers to reduce the noise pollution.

D.2. If environmental impacts are considered significant by the project participants or the host Party, please provide conclusions and all references to support documentation of an environmental impact assessment undertaken in accordance with the procedures as required by the host Party:

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The Environmental Impact Assessment is not required by the Environmental Impact Assessment notification under Environment Protection Act 1986 (Government of India) and hence not conducted as per the requirement of guidelines there under.

SECTION E. Stakeholders' comments

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E.1. Brief description how comments by local stakeholders have been invited and compiled:

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All the individuals and organizations that are impacted by the project are perceived as stakeholders. They can be within the boundaries of the district, state or nation. On deciding above criteria for qualification of the stakeholders, the approval was to select the most appropriate representative body.

The following were identified as stakeholders of the project:

1. UPPCB (Uttar Pradesh Pollution Control Board)
2. Local Village Panchayat (for Pilkhani Distillery)
3. District Development Authority (for Shamli Distillery)

The views of concerned District Development Authority are ensured through the clearance from representative of such local authorities. The views of licensing/ regulatory authorities are enshrined in approvals obtained from them.

E.2. Summary of the comments received:

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Uttar Pradesh Pollution Control Board- has prescribed standards of environmental compliance and it is responsible for monitoring the adherence to the standards. SSLE has received the No Objection Certificate (NOC) from UPPCB.

The **District Development Authority** has the main responsibility of tackling problems of town planning and urban development according to the U.P Urban planning & development Act, 1973. SSLE is in process of obtaining clearance from concerned District Development Authorities for the 1MW biogas based power project of Shamli Distillery at Dist- Muzaffarnagar and it would be reported to the validators during validation stage.

The **Village Panchayat** / local elected body of representatives administering the local area are a true representation of the local population in a democratic country like India and hence their consent / permission to set up the project are essential. SSLE has received the clearance from Gram Panchayat for the 1MW biogas based power project of Pilkhani Distillery at Dist- Saharanpur and it would be reported to the validators during validation stage.

E.3. Report on how due account was taken of any comments received:

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No negative comments are expected from the stakeholders.

Annex 1

CONTACT INFORMATION ON PARTICIPANTS IN THE PROJECT ACTIVITY

Organization:	Sir Shadi Lal Enterprise Ltd
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Represented by:	
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Department:	
Mobile:	
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Annex 2

INFORMATION REGARDING PUBLIC FUNDING

No public funding is involved in this project activity.

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Annex 3

BASELINE INFORMATION

Indian power grid system is divided into five regions namely Northern, Southern, Eastern, Western and North Eastern regions. These regions have independent load dispatch centres. Northern region mainly consists of Delhi, Uttar Pradesh, Rajasthan, Uttaranchal, Haryana, Himachal Pradesh, Punjab and Jammu Kashmir state. Each state has their own State Electricity Boards / Corporations to manage their respective power generating plants.

In this state, Uttar Pradesh Power Corporation Limited (UPPCL) manages the power transmission and distribution. Uttar Pradesh Rajya Vidyut Utpadan Nigam Limited (UPRVUNL) manages all the thermal power generation plants in the state and hydro power plants are managed by Uttar Pradesh Jal Vidyut Nigam Limited (UPJVNL). National Thermal Power Corporation (NTPC) and National Power Corporation (NPC) manage the central government owned power generation plants.

The relevant grid for the determination of the combined margin is selected as the northern region grid. This is because, although electricity generation and distribution remains largely in the hands of the Uttar Pradesh Power Corporation Limited, the regional grid is becoming more integrated. Moreover, central sector generation from the entire northern region is transmitted to UP.

The actual generation data of the northern grid for the recent five years are analysed.

	GWh									
Fuel	**2005**	**%**	**2004**	**%**	**2003**	**%**	**2002**	**%**	**2001**	**%**
Hydro &Nuclear	43577	25.82	44662	26.859	38863	24.98	37239	24.6	35741	24.77
Coal, NG, Diesel	125218	74.18	121621	73.141	116701	75.02	113788	75.3	108515	75.22
Total	168795	100.00	166283	100	155564	100.00	151027	100	144256	100

From the table, it is evident that for the average quantity of electricity generated over the last three years for the northern grid, the contribution of the renewable energy based power projects is 25.9% and that from thermal based power projects is 74.1%. In the northern region, the low cost must run resources constitute less than 50% of the total grid generation. The simple operating margin is therefore selected as the appropriate method to calculate the OM emission factor.

Calculation of Baseline Emission Factor

Baseline emission factor of UP (EF*y*) is calculated as a combined margin (CM), consisting of the combination of operating margin (OM) and build margin (BM) factors according to the following three steps.

STEP 1. Calculate the Operating Margin emission factor
STEP 2. Calculate the Build Margin emission factor
STEP 3. Baseline Emission Factor

The baseline emission factor (EF*y*) of the chosen grid is calculated as combined margin (CM), consisting of the combination of operating margin (OM) and build margin (BM) factors following the guidelines in the section "Consolidated baseline methodology for grid-connected electricity generation from renewable sources" (ACM 0002).

Step 1: Calculation of Operating Margin Emission Factor for the region based on Simple OM

The simple OM emission factor ($EF_{OM, simple,y}$) is calculated as the generation-weighted average emissions per electricity unit (tCO_2/MU) of all generating sources serving the system, not including low-operating cost and must-run power plants. The detailed baseline information is given in Annex 3.

$$EF_{OM, y} = \frac{\Sigma\ Fi,j,y * COEFi,j\ y}{\Sigma\ GENj,y}$$

where Fi,j,y is the amount of fuel i (in a mass or volume unit) consumed by relevant power sources j in year(s) y,
j refers to the power sources delivering electricity to the grid, not including low-operating cost and must run power plants, and including imports5 to the grid,
$COEFi,j\ y$ is the CO_2 emission coefficient of fuel i (tCO_2 / mass or volume unit of the fuel), taking into account the carbon content of the fuels used by relevant power sources j and the percent oxidation of the fuel in year(s) y, and
$GENj,y$ is the electricity (MWh) delivered to the grid by source j.

The CO_2 emission coefficient $COEFi$ is obtained as

$$COEFi = NCVi * EFCO2,i * OXIDi$$

where:
$NCVi$ is the net calorific value (energy content) per mass or volume unit of a fuel i,
$OXIDi$ is the oxidation factor of the fuel
$EFCO2,i$ is the CO_2 emission factor per unit of energy of the fuel i.

SSLE has therefore adopted the 'Simple OM' method, and the simple OM emission factor is calculated using "A 3-year average statistics"

State	Generation GWh		
	2005	2004	2003
Delhi	11170.38	10593	8780
Haryana	9646.44	9792	8908
Himachal Pradesh	16020.29	11753	8735
Jammu & Kashmir	6405.24	7270	5983
Punjab	22087.95	25581	23690
Rajasthan	25933.43	23045	21861
Uttar Pradesh	73954.87	74345	73837
Uttaranchal	3577.23	3904	3770

Factor	2005	2004	2003
∑ Fi,,j,y x COEF i,,j (tons/year)	142011855	138597138	133070105
∑ GEN i,,j (MU)	125218	121621	116701
∑ EF OM,y (tCO_2/yr)	1134	1139.6	1140
Average ∑ EF OM,y	1137.9 tCO_2 / GWh		

Step 2: Calculation of Build Margin Emission Factor for the region (ex-ante):

The project developer has adopted option 1 (Ex-ante), which requires to calculate the Build Margin emission factor *EFBM,y ex-ante* based on the most recent information available on plants already built for sample group *m* at the time of PDD submission. The data used to determine the simple BM emission factor (*EFBM,y*)

$$EF_{BM,\,y} = \frac{\Sigma\, Fi,m,\, y * COEFi,m}{\Sigma\, GENm,y}$$

where
Fi,m,y, *COEFi,m* are analogous to the variables described for the simple OM method above for plants *m*.

A	20% of grid (MU)	33759
B	Plants meeting 20% (MU)	34041
C	Last Five Plants Total (MU)	12432

For the SSLE project, the sample group m that consists of (b) the power plants capacity additions in the electricity system that comprise 20% of the system generation and that have built most recently is adopted. Below is a list of power plants that comprises 20% of the system generation and which are built most recently.

Power Plants	Fuel	Generation (GWh) 2005	Emission factor IPCC tCO2/GWh	Emissions tCO2 2005	Year of Commission
Pragati CCGT	Gas HBJ	2550.7	687	1751935	2003
Chamera II	Hydro	1347.3	0	0	2003
Naptha Jhakri	Hydro	5109.48	0	0	2003
Kota	Coal 4F	1470	1168	1717075	2003
Suratgharh	Coal 2W	1955	1074	2100409	2003
Ramgharh ST	Gas HBJ	17	687	11676	2003
Baspa	Hydro	1193.16	0	0	2002
Upper sindh	Hydro	177.45	0	0	2002
Sewa	Hydro	10.17	0	0	2002
Suratgharh	Coal 2W	1951	1074	2096111	2002
Ramgharh GT	Gas HBJ	342.93	687	235540	2002
Panipat	Coal 4F	1482	1463	2168290	2001
Malana	Hydro	269.66	0	0	2001
Chenani	Hydro	77.33	0	0	2001
Suratgharh	Coal 2W	1876	1074	2015533	2001
F'Bad CCGT	Gas HBJ		484		2000
Ghanvi	Hydro	74.08	0	0	2000
Ranjit sagar	Hydro	1144.56	0	0	2000
Suratgharh	Coal 2W	1704	1074	1830740	2000
RAPS	Nuclear	1470	0	0	2000
RAPS	Nuclear	1649	0	0	2000
Tanda	Coal 4F	809	1844	1491700	2000
Tanda	Coal 4F	841	1844	1550704	2000
Tanda	Coal 4F	836	1844	1541484	2000
Tanda	Coal 4F	832	1844	1534109	2000
F'Bad CCGT	Gas HBJ	3161.9	484	1528889	1999
Unchahar	Coal 3E	1690	1168	1974053	1999

$\sum$ Fi,,j,y x COEF i,,j (tons/year)	23548247

∑ GEN i,,j (MU)	34041
∑ EF BM,y (tCO_2/yr)	691.77

Step 3 Baseline Emission Factor ($EF_{,y}$)

The baseline emission factor $EF_{,y}$ is calculated as the weighted average of the Operating Margin emission factor ($EF_{OM,\ y}$) and the Build Margin emission factor (*EFBM,y*) , where the weights W_{OM} and W_{BM}, by default, are 50% and $EF_{OM,,y}$ and EF*BM,y* are calculated as described in steps 1 and 2 above and are expressed in tCO_2/MU.

$EF_{grid,,y} = 0.5(EF_{OM,\ y} + EF_{BM,\ y})$

∑ EF BM,y	691.77 tCO_2e/ GWh
∑ EF OM,y	1137.99 tCO_2e/ GWh
∑ EFy (Avg of OM &BM)	**914.88 tCO_2e/Gwh**

Determine the Emission Reductions

The project activity mainly reduces CO_2 emissions through substitution of power and heat generation with fossil fuels by energy generation with biomass. The emission reduction ER_y by the project activity during a given year *y* is given by:

$$ER_y = ER_{heat,y} + ER_{electricity,y} + BE_{biomass,y} - PE_y - L_y$$

Where

ERheat,y are the emission reductions due to displacement of heat during the year *y* in tons of CO2,

$ER_{electricity,y}$ are the emission reductions through substitution of electricity generation with fossil fuels

BEbiomass,y are the baseline emissions due to natural decay or burning of anthropogenic sources of biomass during the year *y* in tons of CO2 equivalents,

PE_y are the project emissions

L_y are emissions due to leakage

Annex 4

MONITORING INFORMATION

Please refer section B for monitoring information

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