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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"Renewable Energy Project in distilleries of Sir Shadi Lal Enterprises Ltd." at Pilkhali Distillery District-Saharanpur: Region – Pilkhani and Shamli Distillery: District – Muzaffarnagar, Region – Shamli, Uttar Pradesh by M/s Sir Shadi Lal Enterprises Ltd.
Version- 04
Date- 22/01/2008

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:

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

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A.4.1.1. Host Party(ies):

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CDM – Executive Board

India

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

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Uttar Pradesh

A.4.1.3. City/Town/Community etc:

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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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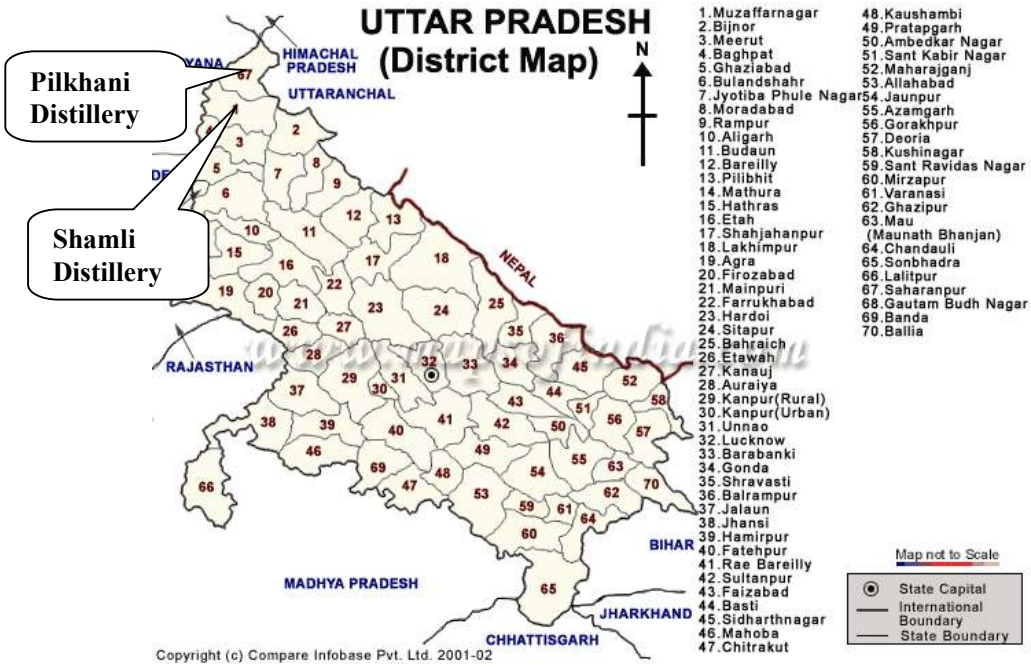
The project is located at different locations as given below:

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 12, EB33.

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 and to generate electricity. This electricity generated would displace the electricity imported from grid prior to the project and also replaces diesel oil that had been used for fulfilling the requirements of manufacturing process.

Shamli Distillery is generating 15,000M^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 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
2008	11,620
2009	11,620
2010	11,620
2011	11,620
2012	11,620
2013	11,620
2014	11,620
2015	11,620
2016	11,620
2017	11,620
Total estimated reductions (tones of CO2 e)	**116,200**
Total number of crediting years	**10y-0m**
Annual average over the crediting period of estimated reductions (tones of CO2 e)	**11,620**

In the above table, the year 2008 corresponds to the period starting from 01.04.2008 to 31.03.2009. Similar interpretation shall apply for remaining years. The crediting period will start from the date of registration of the project with CDM EB.

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 12, EB 33.

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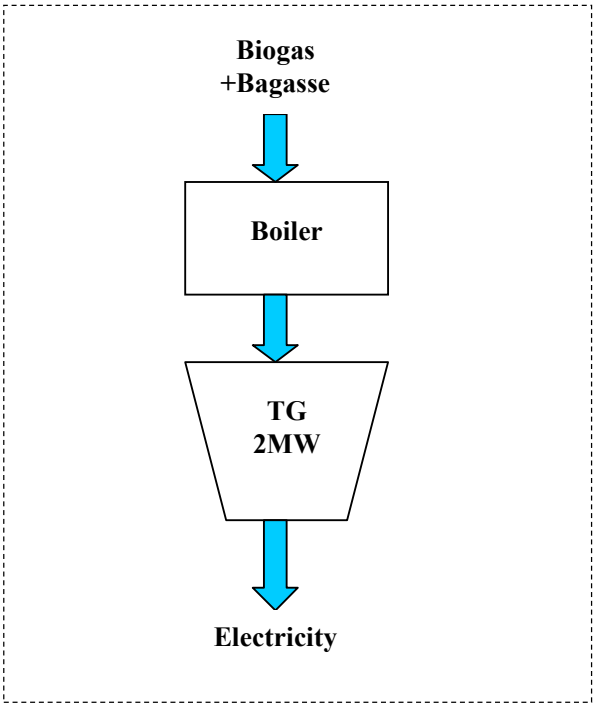
As per the guidelines mentioned in Type 1.C of the simplified modalities and procedures for small-scale CDM project activities, project boundary encompasses the physical and geographical site of the renewable generation source.

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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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 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 proponent had considered the emission factor for Diesel oil as 0.8 kg CO2e/kWh. The source for assuming the same is "Emission factors for diesel generator systems (in kg CO2e/kWh) is given in Table I.D.1 of AMS ID, Version-13, EB 36". The baseline emission factor for grid has been considered from the "CO2 Baseline Database" published by CEA on 15th December 2007, Version 3. The combined

margin grid emission factor computed from the above analysis is thus 0.787118tCO2/MWh for the Northern Regional Grid.

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.

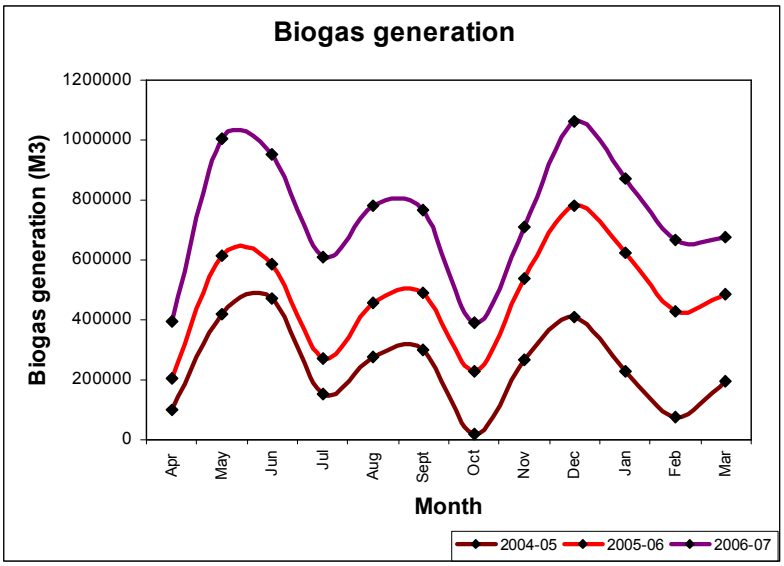
In accordance with the simplified modalities and procedures for small-scale CDM project activities, a simplified baseline and monitoring methodology listed in Appendix B may be used if project participants can demonstrate that the project activity would otherwise not be implemented due to the existence 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. The major barrier for the implementation of the project was the investment cost. 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 captured biogas in the decomposition plant and so required additional investments in turbine, boiler, allied systems, required controls and suitably skilled human resource. However, SSLE went ahead to implement the project to reduce greenhouse gas emissions and to utilize the biogas to generate electricity.

Project activity proposes to use biogas and bagasse as the raw material for power generation. Molasses is the basic raw material for the distillery where biogas is produced by the fermentation process. Any fluctuations in supply of raw material in the distillery would affect the effluent generated that in turn would affect the biogas generation.

Fluctuating production of biogas: Success of the proposed project activity depends on uninterrupted supply of biogas from the effluent treatment process at consistently high temperatures to the boilers. However, supply of this high temperature biogas depends on continuous operation of distillery. Inconsistent availability of biogas from distillery manufacture is a major risk for setting up a power plant; this risk is also evident from the fact that biogas generation at SSLE has not been quite consistent due to various reasons in recent past. This variation in production of distillery has direct impact on the quantum of biogas generation.



Production data of SSLE for the past 3years shows that production of biogas has not been consistent, which depicts the variations in the biogas generation which in turn affects power generation. Any shutdown in distillery (10 to 15days in a year for repairs and maintenance or shock loads arising out of distillery operation and variations in feed characteristics, variation in temperature conditions) would take at least more than 30days for reactor to stabilize for biogas generation which upsets the power generation system which hinder the production process of distillery. Thus the uncertainty with regards to the production might render the project financially unstable and hence project faces investment barrier. This increase in operational cost of the distillery and power plant would be significantly compensated by the proposed carbon financing and will help to increase the sustainability of the project.

Project promoter is maintaining a distillery unit with core business in alcohol manufacturing. To execute implementation of the proposed wastewater treatment scheme, the management 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. 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.

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.

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.

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

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.

The project activity has adopted a high-pressure technology for power and heat generation which was relatively new in state and in the India. The low penetration of this technology is due to the efficiency of existing equipments, to the availability of skilled manpower to operate the plant continuously. SSLE was one of the first few companies in Uttar Pradesh to overcome the technology barrier by adopting 45kg/cm^2 pressure for steam and power generation in their distillery unit.

Further more project promoter is maintaining a distillery unit with core business in alcohol manufacturing. To execute implementation of the proposed wastewater treatment scheme, the management 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. 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. As discussed earlier due to variations in characteristics of different fuels (biogas and bagasse) fired in the boilers may lead to heat release rate variations which can affect the steam generation. Any temperature variations in the biogas production process from the distillery unit in turn affect the power generation thereby upsetting again the distillery manufacturing performance which is huge loss for the company.

Operational risk also involves need for more safety precautions due to usage of gas, skilled manpower to operate the system due to gas handling and bagasse handling, the entire system of distilleries operates only on biogas generated power & 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.

SSLE was reluctant to go ahead with the project activity due to its low penetration in the industry. There are about 44 distilleries in the entire Uttar Pradesh State. The power generation using biogas is not a common practice in Uttar Pradesh distilleries (as per the data attained from Uttar Pradesh Distillery Association).

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.

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

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-13, 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:	This data item is required for estimating the baseline emissions and emission reductions.

Data / Parameter:	Grid Emission Factor
Data unit:	(tCO2/GWh)
Description:	EF_y
Source of data used:	Central Electricity Authority Baseline database
Value applied:	787.118
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 has been considered from the "**CO2 Baseline Database**" published by CEA on 15th December 2007, Version 3. The emission factor published by CEA for the latest 3years is based on combined margin approach.
Any comment:	This data item is required for estimating the baseline emissions and emission reductions.

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)

= 8 X 787.118 = 6,234 tCO2e / year

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

= 6,732 X 0.8 = 5,386 tCO2e / year

Total Baseline emissions = 6,234+ 5,386 = 11,620tCO2e /year

Project Emissions:

There are no on-site and off-site consumption of fossil fuel with in the project boundary. The project uses biogas that generated from anaerobic digester along with bagasse to generate steam and electricity; both the biogas and bagasse are produced within the project boundary. There is no outside fuel procured for the project activity. Therefore there is the net project emissions from the project activity are zero.

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) =** 11,620 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 = 11,620 – 0 – 0 = 11,620 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)
2008	0	11,620	11,620
2009	0	11,620	11,620
2010	0	11,620	11,620
2011	0	11,620	11,620
2012	0	11,620	11,620
2013	0	11,620	11,620
2014	0	11,620	11,620
2015	0	11,620	11,620
2016	0	11,620	11,620
2017	0	11,620	11,620

In the above table, the year 2008 corresponds to the period starting from 01.04.2008 to 31.03.2009. Similar interpretation shall apply for remaining years. The crediting period will start from the date of registration of the project with CDM EB.

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:	EG_{total}
Data unit:	MWh/yr
Description:	Total electricity generated from the project activity
Source of data to be used:	Project Records/Log Book
Value of data applied for the purpose of calculating expected emission reductions in section B.5	The data holds a significant purpose for determining the baseline emissions and the emissions reductions accruing due to the project activity.
Description of measurement methods and procedures to be applied:	100% of the data is measured and will be recorded continuously. Data recorded will be stored in the electronic/paper for crediting period+2years.
QA/QC procedures to	Meters at plant and DCS will measure the data online as per the Monitoring

be applied:	Plan. Person In-charge would be responsible for regular calibration of the meter. Regular maintenance and in-house calibration of meters will ensure the power generating figures are correct.
Any comment:	Meters at plant will automatically measure the data. The data will be recorded in project logbook.

Data / Parameter:	Biogas flow rate at the boiler inlet
Data unit:	m3/hr
Description:	Amount of biogas generated from the digester
Source of data to be used:	Plant records
Value of data	The data holds a significant purpose for determining the emissions reductions accruing due to the project activity.
Description of measurement methods and procedures to be applied:	The total biogas generated from digestion will be measured using flow meters. 100% of the data is measured and will be recorded continuously. Data recorded will be stored in the electronic/paper from for crediting period+2years.
QA/QC procedures to be applied:	Flow meters will undergo maintenance/calibration subject to appropriate industry standards.
Any comment:	

Data / Parameter:	Quantity of bagasse fired
Data unit:	Tons/day
Description:	Quantity of bagasse combusted in the project plant during the year y
Source of data to be used:	Onsite measurement
Value of data applied for the purpose of calculating expected emission reductions in section B.5	Total annual bagasse sent for combustion. The data holds a significant purpose for determining emissions reductions accruing due to the project activity.
Description of measurement methods and procedures to be applied:	The total bagasse used for the project plant will be measured continuously. The data will be recorded in paper and will be archived for crediting + 2 years.
QA/QC procedures to be applied:	Yes. Direct measurement of the data at the plant site will be cross-verified against the production. Person Incharge would be responsible for calibration of the meters as per national standards.
Any comment:	-

B.7.2 Description of the monitoring plan:

>>

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 management of the plant will designate one person to be responsible for the collection of data required to conduct the monitoring plan who will report to the General Manager (GM). The management of the plant will put in place monthly reporting of electricity generation. This data will be part of the management information systems for the power plant.

The purpose of the monitoring plan is to define the procedures and responsibilities for GHG Performance, Project Management, Registration, Monitoring, Measurement and Reporting of data and dealing with uncertainties.

Authorities and Responsibilities of Project Management, Registration, Monitoring, Measurement and Reporting:

Shift Engineer: Responsible for reporting hourly data of the steam generated from boilers, steam fed to turbines, parameters of steam, total electricity generation. The report is then sent to the Shift Supervisor for his review.

Shift Supervisor: Responsible for reporting daily data of the steam generated from boilers, steam fed to turbines, parameters of steam, total electricity generation. The report is then sent to the General Manager (Power Plant) for his review.

General Manager (Power Plant): Responsible for reviewing the monitored parameters and over all responsible for all the data pertaining to the CDM project.

The review of data recorded, will be done in the presence of the Shift Engineer to check authenticity or recorded information. It will be ensured that all the data required for CDM is available for verification. If there are any gaps/ deviations, the General Manager (Power Plant) will inform the Shift Supervisor on the importance of recording all data and will preciseness and the with clarity.

Once all data is reviewed for correctness, it will be approved and initiated by the General Manager (Power Plant) in the presence of Shift Engineer with deviations supported with authentic information. This document shall be kept available for verification by external parties.

Training of Monitoring Personnel:
The project proponent has developed a training protocol along the time of the implementation of the project and more over as per the supplier's contract from time to time the training would be provided to the plant personnel by the senior competent authorities of the management as well as the equipments supplier and also by the Internal CDM Audit Team and CDM consultants.

The purpose of developing training protocol is to establish a system for training and awareness of staff on monitoring and recording of clean development mechanism (CDM) related data. The scope of the training protocol of Operational staff at SSLE whose work in related to biogas generation, power generation. General Manager (Power Plant) and Manager (Power Plant) are responsible for deciding the contents of training program. Manager (Power Plant) and Shift Inspector are responsible for organizing, conducting training, supervising and maintaining training records.

Procedure for emergency preparedness:

The purpose of developing emergency preparedness is to establish a system to deal with emergency situations, in order to minimize hazards to the environment during the operation of the CDM project. The scope of the emergency preparedness is mainly on all activities and services related to the CDM project.

Manager (Power Plant) and Manager (Safety) are to identify potential hazardous and emergency situations for the activities of different areas in consultation with the concerned heads/ managers, then make all concerned personnel aware of all the aspects & conditions that may lead to emergency situations. An on site emergency plan will be considered which illustrate all the emergency conditions, preparedness and response plan.

Procedure for calibration and maintenance of monitoring equipment:
The purpose of developing calibration schedule and monitoring equipments is to establish a system for maintaining and calibrating the monitoring equipments that record the parameters pertaining to the CDM project. The scope of calibration schedule and monitoring equipments is that record power generation, amount of biogas generation, amount of bagasse used etc

All instruments related to the activity will be calibrated and marked at regular intervals as per the validity norms so that the accuracy of measurements can be ensured at all times. Manager (Power Plant) is responsible for conducting regular checks on monitoring equipments to ensure its maintenance and to ensure the accuracy of measurements

Handling of Day-to-Day record:
The purpose of developing systemic procedures for monitoring, measurements and reporting of the data and parameters that need to be observed and recorded will be identified as provided Section B of the PDD under monitoring methodology as per the CDM requirements. All monitoring measurements and reports as per the monitoring and verification protocol defined in Section B of the CDM PDD. Shift Inspector has the overall responsibility for all measurements. Manager's (Power Plant) would identify information/data/record that needs to be maintained as per the CDM PDD and prepare a record matrix/list for records as per the M&V protocol of the CDM PDD including the details of the retention period. Shift Engineer would maintain active files/registers/books for this data indexed in a manner to enable easy retrieval of specific data/record. Manager (Power Plant) has the overall responsibility for record handling and maintenance. The monitored records will be reviewed for correctness once a month considering the accuracy requirements under CDM.

Uncertainties and adjustments
Uncertainties and adjustments to monitored data will be reviewed in the context of non-availability of certain data/ less clarity of recorded data. The Shift Inspector will be consulted on the reasons for the same. Manager will suggest adjustments to such data in accordance with the explanation provided. Authentic information shall form the basis of adjustments to the data. Authentic document shall also be attached with recorded data in order to enable verification of the same.

Procedure for internal Audit
A special internal audit team will be appointed by the General Manager and Manager (Power Plant) to independently conduct internal audit of monitored data. The internal audit will be conducted once in 6 months. The audit timing will be at least 2 months prior to actual verification by external verifiers. The internal audit and team will review all the records pertaining to power generation, checking monitoring equipments for accuracy and whether calibration was performed. The internal audit team will produce an audit report providing details of concerns that need to be attended to immediately before actual

verification by the external verifier. A team consisting of experienced personnel will be constituted for the Internal CDM Audit, who will conduct yearly Audit. Wherever required the assistance from the CDM PDD consultants will be sought.

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: 12/01/2008

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:

>>
19/12/2005

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:

>>
01/04/2008 (or from 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[1] vide S.O. 60(E) dated 27/01/94 of the Ministry of Environment and Forest, Government of India. However the environmental impacts of the project activity are justified 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 dated 27th Jan 1994 (Government of India) and hence not conducted as per the requirement of guidelines there under.

[1] http://envfor.nic.in/divisions/iass/eia/Annex1.htm

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. No negative comments from received.

Local populace, represented by the Gram Panchayat, the elected administrative body of the village, where the project is getting implemented, will issue No-Objection Certificate (NOC) for setting up of the project under the jurisdiction of the village. A Letter from Muzaffarnagar Nagar Development Authority, the elected administrative body of Shamli issued No-Objection Certificate for setting up the project. Gram Pradhan, an elected administrative body of Philkani issued NOC (No-Objection Certificate) for the project. No negative comments received.

SSLE had taken up formal one-to-one discussions with Gram Panchayat Authority representing local populace and the Local Stakeholders have been consulted through direct meeting. They were informed about agenda, venue, date and timings of the meeting for inviting their valuable comments on the project activity. The stakeholder public hearing was conducted on 03/05/2007 in Shamli and on 04/05/2007 in Philkani at the relevant plant premises. The relevant company representatives headed the chair expressed his intention of calling for meeting and his interest towards setting up a biogas based power project. Their statement also follows possible reduction of GHG emissions by setting up the renewable power project and employment generation for the local populace.

Local members responded to the hearing and presented their views, comments and raised queries, which SSLE responded. Project activity was found to be having only positive impact on people in general. All participants enthusiastically participated in the discussions on the project and raised various queries which were appropriately answered to.

Q1: How the plant is environmentally friendly and advantages on reducing the emissions into atmosphere

Ans: The project would help in achieving zero discharge objective of the company. The capturing of biogas results in avoidance of methane emission in the environment. Thus is a clean power generation utilizing wastewater generated biogas and not using harmful fossil fuels.

Q2: Does the project helpful for the local people in terms of employment opportunities in the area?
Ans: The project required manpower during construction phase and operation phase of the plant.

The local members expressed their enthusiasm on coming up of the power unit in their respective villages.

No negative comments were received on the project activity, which is evident from the licences / approvals / clearances accorded to the project activity by the stakeholders.

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

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No adverse comment from stakeholders on the project activity received.

Annex 1

CONTACT INFORMATION ON PARTICIPANTS IN THE PROJECT ACTIVITY

Organization:	Sir Shadi Lal Enterprise Ltd
Street/P.O.Box:	4-A, Hansalaya15, Barakhamba Road
Building:	
City:	New Delhi
State/Region:	
Postfix/ZIP:	110 001
Country:	India
Telephone:	+91 11 2332 1827/ 2375 2231
FAX:	+91 11 2372 2193
E-Mail:	skm_sslel@sify.com
URL:	www.sirshadilal.com
Represented by:	
Title:	V.P. (Taxation & Secretarial)
Salutation:	Mr.
Last Name:	Malhotra
Middle Name:	
First Name:	Sunit Malhotra
Department:	
Mobile:	
Direct FAX:	
Direct tel:	
Personal E-Mail:	

Annex 2

INFORMATION REGARDING PUBLIC FUNDING

No public funding is involved in this project activity.

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Annex 3

BASELINE INFORMATION

For the project activity the baseline scenario involves electricity consumption which entails GHG 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 proponent had considered the emission factor for Diesel oil as 0.8 kg CO2e/kWh. The source for assuming the same is "Emission factors for diesel generator systems (in kg CO2e/kWh) is given in Table I.D.1 of AMS ID, Version-13". The baseline emission factor for grid has been considered from the "CO2 Baseline Database" published by CEA on 15th December 2007, Version 3.

Complete analysis of the system boundary's electricity generation mix has been carried out for calculating the emission factor of Northern Regional Grid by Central Electric Authority (CEA) of India in its CO2 Baseline Database Version 3 dated 15th December 2007. The project proponent has used this analysis for computation of the grid emission factor. For more information please refer to http://www.cea.nic.in/planning/c%20and%20e/Government%20of%20India%20website.htm. The combined margin grid emission factor computed from the above analysis is thus 0.787118tCO2/MWh for the Northern Regional Grid.

Annex 4

MONITORING INFORMATION

Please refer section B for monitoring information

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