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

CONTENTS

Annexes

Revision history of this document

Version Number	Date	Description and reason of revision
01	21 January 2003	Initial adoption
02	8 July 2005	• The Board agreed to revise the CDM SSC PDD to reflect guidance and clarifications provided by the Board since version 01 of this document. • 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	• 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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Energy Efficiency Improvement by Waste Heat Recovery
Version 3,
05/10/07

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

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The proposed project activity involves installation of a waste heat recovery boiler (WHRB) to recover heat from flue gases of the calcium carbide furnace (CCF). The calcium carbide furnace is installed at the integrated manufacturing complex of DCM Shriram Consolidated Limited situated at Kota, Rajasthan. The WHRB will recover heat from high temperature waste flue gases to generate steam that is used in the process. Before the implementation of the project activity this steam was generated in coal based boilers. Hence, the proposed project activity aims to reduce carbon dioxide emissions by utilizing the waste heat from CCF.

The calcium carbide plant was initially operating only two open type furnaces with 12 MVA and 20 MVA capacity each. This capacity was not sufficient to meet the increasing demand for calcium carbide. In order to meet the additional demand the DSCL management proposed to install a new 30 MVA furnace. For the new proposed 30 MVA furnace options were evaluated so that heat which is wasted in the conventional furnace can be utilized to the maximum. Two type of the furnace design were available Closed Type and Semi Closed Type. The Installation of both was very costly, but cost effectiveness was better with the semi closed type. The management then decided to install a semi closed type of furnace from India the advantage to this is that waste heat can be utilized through the installation of WHRB. The WHRB is installed at the exhaust of 30 MVA furnace. In the earlier designs of 12 MVA and 20 MVA furnaces, the exhaust gases coming from the Calcium Carbide furnace had a temperature of approximately 500^0 C and were diluted in safety air dampers, to prevent damage of bag house filters, and then released to atmosphere through stacks. The new design, undertaken in-house, is first of it's kind in the India. It ensures that sufficient temperature, necessary for generating steam, is obtained in WHRB and the low temperature at the exit of WHRB facilitates the use of lighter and thinner bags, which are easy to clean and are less in number thereby increasing the cleaning efficiency.

Prior to the implementation of project activity the process steam requirement of Caustic Concentration Unit (CCU) and Poly Vinyl Chloride (PVC) plants were met through the steam generated in fossil fuel based boilers. Since, the two furnaces were of conventional design (i.e. open furnace) and there was no technological facility available to tap the heat of flue gases and the plant was continuously loosing heat and emitting carbon dioxide by combusting fossil fuel in the boilers. With the implementation of the project activity the waste heat will be used to generate steam which in turn will displace some of the fossil fuel used for steam generation in the present boilers

There was no regulatory requirement from the government to alter the operational activity however the DSCL management as part of their socio-economic and environmental policy, took initiative to resolve this problem.

The project activity (i.e. installation of WHRB) considerably reduces the dependency on fossil fuel based boilers for steam requirement for the CCU and PVC plants, thereby reducing carbon dioxide emissions.

The project implementation will further result in reduction of other harmful gases (NOx and SOx) that arise from the combustion of fossil fuels used in power generation. The project activity will promote the use of this innovative technology, which is a first of its kind in the world, for increasing system efficiency.

The project activity contributes to environmental, technological and socio-economic development in the region. The project activity has generated direct and indirect employment opportunities for skilled/semi-skilled manpower, during the construction and operational phase of the project. Indirect employment has been generated for the equipment supplier, contractors & technical consultants. The project activity has also resulted in providing better Occupational Health and Safety conditions at the work place in compliance with OHSAS: 18001:1999.

A.3. Project participants:

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Name of 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)
India (host)	**Private entity:** DCM Shriram Consolidated Ltd.	No
India (host)	**Private entity**: DSCL Energy Services Company Limited	No
(*) In accordance with the CDM modalities and procedures, at the time of making the CDM-PDD public at the stage of validation, a Party involved may or may not have provided its approval. At the time of requesting registration, the approval by the Party(ies) involved is required.		

DCM Shriram Consolidated Ltd. is the project owner, and DSCL Energy Services Company Ltd. is CDM project developers. The official contact for the CDM project activity is DCM Shriram Consolidated Ltd.

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

The proposed project activity involves installation of a waste heat recovery boiler (WHRB) to recover heat from flue gases of the 30 MVA furnace calcium carbide furnace (CCF). The WHRB will recover heat from high temperature waste flue gases to generate steam that is used in the process. Before the implementation of the project activity this steam was generated in coal based boilers. The 30 MVA furnace is a semiclosed furnace furnished with moving gates which has an additional advantage to control the temperature of the flue gases.

The project is first of its kind in the India. Plant owner has hired the people who have an experience in the operation of WHRB. Internal apprenticeship training was organised in their own Power plant for the operation and maintenance of the boiler.

There are no national policies or legal compliance relevant for setting up a WHRB in India.

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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India

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

>>
Rajasthan

A.4.1.3. City/Town/Community etc:

>>
Kota

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

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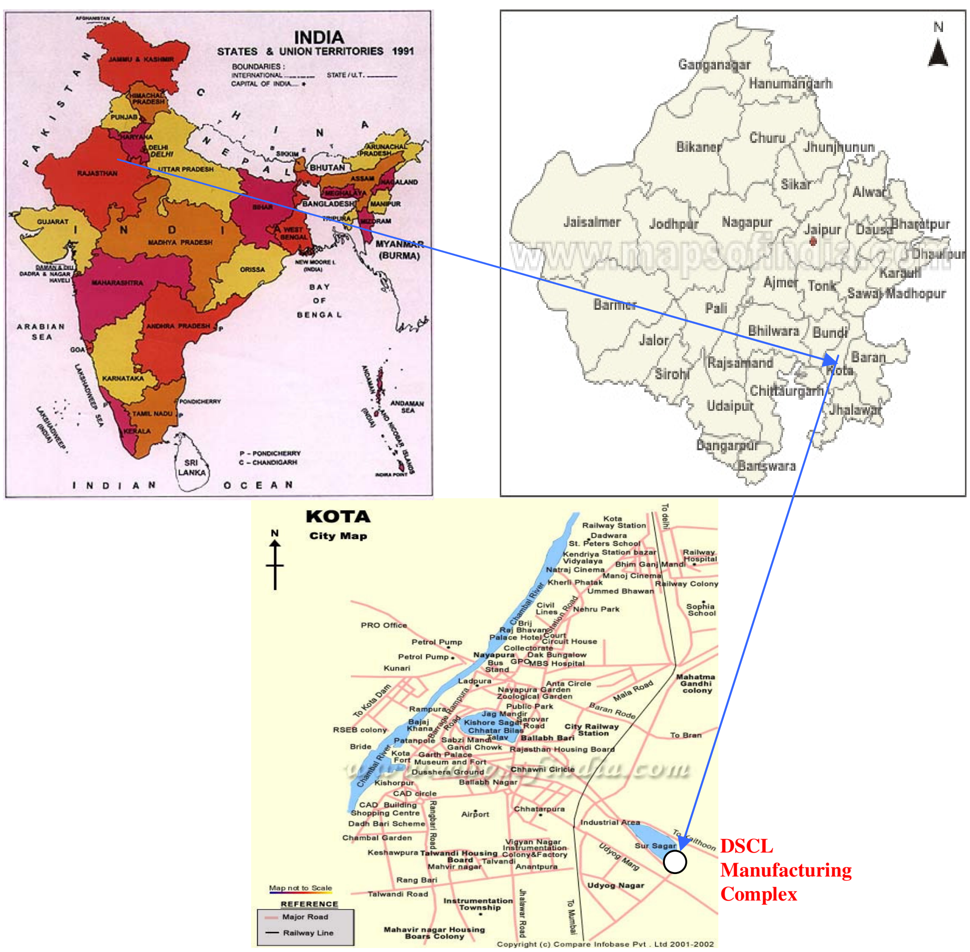
The address of the Complex is:

DCM Shriram Consolidated Limited.
Shriram Nagar,
Distt. Kota.
Rajasthan.

The plant is located near NH-12 (Jaipur-Jabalpur highway) and is 240 km from state capital Jaipur. The Plant is located 271 m above sea level. Kota is located at a latitude and longitude of $25^0$10'48" N and $75^0$49'48" E respectively.
The geographical location of project site is shown in below figures.



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

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Type II: Energy efficiency improvement projects

Category B: Supply side energy efficiency improvements – Generation / Scope 1 / Version 08 (23/12/2006)

The project activity is covered under Sectoral Scope – 1, Energy Industries (Renewable/ non-renewable sources) as per 'list of Sectoral Scope' available on UNFCCC website.

As mentioned in section A.2., the proposed project activity will recover heat from high temperature waste flue gases in the WHRB to generate steam, which will be used in the process. This will replace the present fossil fuel based steam used in the CCU and PVC plants.

The project is first of its kind in the India. Plant owner has hired the people who have an experience in the operation of WHRB. Internal apprenticeship training was organised in their own Power plant for the operation and maintenance in boiler.

The project activity will remain eligible as a small scale project throughout its life time due to the inability to scale-up the capacity without the installation of additional heat transfer equipments.

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

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Year	**Estimation of emission reductions (tonnes of CO2e)**
2008	24,311
2009	24,311
2010	24,311
2011	24,311
2012	24,311
2013	24,311
2014	24,311
2015	24,311
2016	24,311
2017	24,311
Total estimated reductions (tonnes of CO2 e)	**243,110**
Total number of crediting years	10
Annual average over the crediting period of estimated reductions (tonnes of CO_2e)	**24,311**

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

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There is no public funding available to the project activity.

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

As per Appendix C, paragraph 2 of the 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 currently no registered CDM project at the site either large scale or small scale, the project will meet the criteria of debundling.

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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Type II: Renewable Energy Projects
AMS IIB: Supply side energy efficiency improvements – Generation.

Sectoral Scope – 1. Energy Industries (Renewables/non-renewable sources)

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

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The project activity is covered under Sectoral Scope – 1. Energy Industries (Renewables/non-renewable sources) as per 'List of Sectoral Scopes' available in UNFCCC website. As per the provisions of Appendix B of Simplified Modalities and Procedures for Small Scale CDM Project Activities, the small scale methodology AMS II.B i.e. "Type II – Energy efficiency improvement projects of category II.B – Supply side energy efficiency improvements – Generation", comprises technologies or measures to improve efficiency of fossil fuel generating units that supply electricity or meet thermal requirement by reducing energy or fuel consumption by upto the equivalent of 60 GWh_{el} per year. A total saving of 60 GWh_{el} per year is equivalent to maximal saving of 180 GWh_{th} per year in the fuel input to the generating unit

The project activity increases system efficiency by recovering heat from waste flue gases to generate steam for meeting the process steam requirement of CCU and PVC plants and thus reducing the fossil fuel consumption in power plant. This results in reduction of 24,311tons of coal per annum, with energy equivalent of 75.42 GWh_{th}/annum, which meets the requirement of maximum 180 GWh_{th}/annum for category IIB Small Scale CDM Project Activities.

In accordance with AMS IIB ver. 8, the emission coefficient for coal will be based on test results for samples of coal purchased.

B.3. Description of the project boundary:

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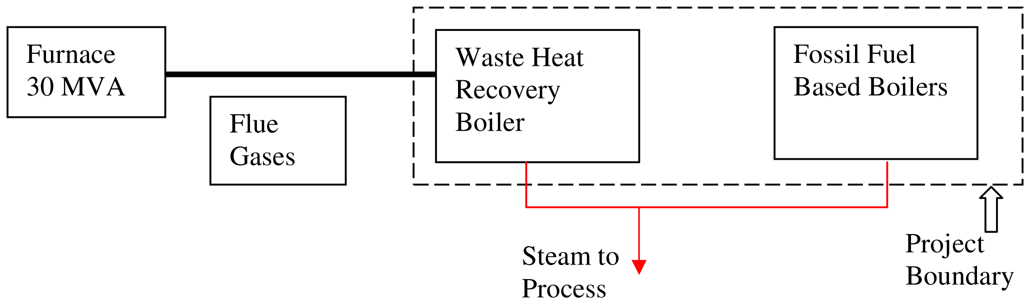
As per the rules and procedures for small scale Type II.B. Projects "*The project boundary encompasses the physical, geographical site of the fossil fuel fired power station unit affected by the efficiency measures*".

The project boundary for the proposed project activity is WHRB unit which include hood of 30 MVA furnace as inlet to this unit and the fossil fuel based boilers affected by the project activity. The project boundary can be depicted as below:



B.4. Description of baseline and its development:

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As per AMS IIB version 08, the emissions baseline is the energy baseline multiplied by an emission coefficient for the fuel used, where energy baseline is calculated as the product of enthalpy, mass flow rate, hours of operation and number of days of operation divided by efficiency (detailed calculation has been given in the section B.6.3). The emission coefficient for coal will be based on test results for samples of coal purchased in the factory. The sources of data for the combined margin, EF_y, are presented in the monitoring plan and this variable will be calculated *ex post*.

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:

In terms of the specific barriers facing the project these fall under the prevailing practice and institutional barriers as outlined in Attachment A to Appendix B of the simplified modalities and procedures for small-scale CDM project activities, namely:

(d) Other barriers: without the project activity, for another specific reason identified by the project participant, such as institutional barriers or limited information, managerial resources, organizational capacity, financial resources, or capacity to absorb new technologies, emissions would have been higher.

In proving the additionality of the project we demonstrate that the project activity is not the part of the baseline scenario, which in the case of DSCL would be generating steam for CCU and PVC plants from existing coal based boilers. The major barrier associated with the project activity is that it is first of its kind in the country with no technology available from any of the suppliers. The plant personnel also contacted many industry experts to suggest possible solution on recovering heat from the CCF furnace but in vain. Therefore, the DSCL management decided to take the proposed project activity as part of their R & D activity and promote the indigenous development of energy efficiency enhancement model using the in-house engineering and innovation capabilities.

The first and most important task for the project activity was to design the WHRB and freezing its specifications. Since no historical data was available for the flue gases profiling, DSCL management had to bear production losses incurring due to frequent shutdowns of plant for the purpose of conducting the pilot studies. Based on data collected and using various engineering simulation software inhouse (e.g. CFX & ASPEN) the indigenous design of WHRB was prepared . The barriers faced during the designing of WHRB are:

- Selection of Material of Construction: There were general guidelines available to select material to make furnace semi closed. The material for hood and hood doors was selected based on the

parameters measured during pilot studies (e.g. flue gas temperature, dust loading and bed level kept during the charging). But soon after commissioning when furnace was loaded, there were problems like bending and distortion of door sheet, and failure of castable causing breakdown of furnace operations and failure of WHRB to operate. Thereafter, these were redesigned, keeping in view the local problems during shutdown improved design hood doors were installed.

- Boiler Design: There was no empirical co-relations available to estimate the waste heat generation and its charcteristics. However, based on the secondary data of other two furnaces (i.e. 12 MVA and 20 MVA Furnaces) and extrapolating it using engineering software inhouse, parameters such as carbide production, radiation, the flue gas quantity and its temperature were estimated for the 30 MVA furnace. Based on the flue gas characteristics like dust content, scaling nature and dust loading were estimated and the material of construction for the WHRB tubes was determined. This helped in estimating the overall heat transfer coefficient that was ultimately used to determine the total WHRB heat transfer area. The WHRB capacity was estimated to be 26.3 TPH of saturated steam at 14.3 kg/cm^2 (g) pressure. The proposed design was a two pass heat exchanger, with first pass as flag type evaporators and second pass as economisers
- Hood Design: To maximize the heat recovery and reduce carbon-burning loss, the furnace was designed to be semi-closed type. In traditional furnaces the furnace hood is located at a considerable height. Using the traditional design in CCF 3 would have resulted in heat loss from the flue gases, and reduction in suction pressure of the furnace. This would have resulted in reduction of available heat for recovery and also impacted the WHRB performance. So, DSCL team brainstormed and a water cooled hood design was proposed to maintain the furnace height at 3.72 m.

. Based on the in-house experience of the furnace operation the estimated capacity of WHRB was 26.3 TPH. Despite the best design efforts, the uncertainties occurred and the operation of WHRB has suffered. During the trial run of WHRB there were more problems faced than anticipated and the design had to be modified to make plant atleast operational. The continous capacity of WHRB that could be achieved is limited to 12 TPH only of saturated steam at 14.3 kg/cm2 (g) pressure. The uncertainties faced due to new design and limited information / reference are :

- The rated capacity of WHRB is 26.3 TPH but the operating capacity is limited to 12 TPH which is farlower than the designed capacity. This is primarily due to inefficient cleaning of accumulated dust on tube banks (Heat transfer zone). Plant will have to live with this for its life time.
- The WHRB failed to reduced the temperature of the flue gases upto the desired inlet temperature of the Bag house, due to which the bag house was damaged To achieve desired inlet temperature at bag house, the furnace load was reduced intermittently and this has resulted in loss of production and thereby reducing efficiency of the whole plant.
- In the 30 MVA furnace hood gates are provided to rake the material for smooth operation of the furnace. When the WHRB outlet temperature shoots up the hood gates are opened to maintain the temperature. This reduces
    - The flue gas temperature thereby reducing the steam generation from WHRB
    - The suction pressure inside the furnace which cause operational problem and leakages leading to high repair & maintenance. WHRB project will have to live with thses inefficiencies throughout its life time.
- The bag house installed after the WHRB reduces the suspended particulate matter of the flue gases to the desired level before being exhausted to the atmosphere. The bag house filters can sustain a temperature up to 180 °C. During the start up the bag house filters got damaged (burnt) due to high flue gas temperature at the WHRB exit. The filters were also damaged when the furnace was taken on full load. To avoid this, an additional safety air damper was designed and provided in

downstream of WHRB to keep the bag house inlet temperature below permissible limit. This inefficiency will remain forever.

- The boiler tubes are cleaned periodically. The dust is collected in hoppers and converted in slurry before being transferred to lagoons. It was observed that this dust was having some traces of acetylene gas which resulted in explosion during cleaning. So, the system was modified so that fresh air is supplied through air blowers to decrease the concentration of acetylene below its explosion limit (i.e.2.5% V/V). Along with this four explosion panels have been installed to avoid hazardous condition.
- In the earlier design, flue gas duct was fabricated of different materials based on the inside flue gas temperature. From furnace top to 16 m height it was made up of mild steel and then up to bag house it was made up of stainless steel. During the trials red spots appeared on various points on the duct due to high temperature of flue gases. The duct ultimately collapsed causing prolonged shutdown of plant and production loss. The entire duct was redesigned and modified to mild steel with a 50 mm insulyte layer inside it and four additional expansion joints.
- Initially a compressor of 7 kg/cm^2 pressure was used to supply air into soot blowers for removing accumulated dust on evaporator and economizer tubes. This compressor was not sufficient to clean the tubes effectively and this resulted in the increase of exit flue gases temperature from the WHRB. Thereafter, a new compressor of 14 kg/cm^2 was installed for better cleaning of tube banks.
- Soon after commissioning when furnace was running on full load, there were problems regarding stabilization of steam drum pressure. This was sorted out by installing a pressure control valve in the downstream of steam line. Later on water hammering was observed in economizer water circuit which was sorted by redesign and changing the water flow circuit of economizer module.

DSCL had taken a lot of risk in terms of technological issues associated with the project activity. The project activity involved high capital investment, inbuilt life long inefficiencies as well as high operation and maintenance cost due to repeated problems during its operation. Besides achieving a perpetually low capacity of 12 TPH against designed capacity of 26.3 TPH, the continuous retrofits and frequent shutdown of the project has impacted and will keep on impacting the performance of the calcium carbide unit.

The barriers faced by DSCL demonstrate that the project activity is over and above business as usual scenario and is therefore additional. The prospect of CER revenue will therefore help the project proponents overcome the unforeseen risks and barriers faced by the project activity.

B.6. Emission reductions:

B.6.1. Explanation of methodological choices:

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The following equation is used to calculate the net emissions reduction from the project activity:

$ER_y = BE_y – PE_y - L_y$

Where:

ER_y = are the emission reductions of the project activity during the year y, t of CO_2
BE_y = are the baseline emissions in year y, t of CO_2
PE_y = are the project emissions in year y, t of CO_2
L_y = is the leakage in year y, t of CO_2

Baseline emissions are calculated from the energy baseline and CO_2 emission coefficient for the fuel displaced as shown in the following equations.

$$BE_y = Q_y \times EF_y$$

Where:

BE_y = Baseline Emissions in year y, tCO_2e
Q_y = Net unit of energy saved in year y, GJ
EF_y = Carbon dioxide emissions factor, tCO_2e/GJ

Q_y will be estimated by measuring the steam generated from WHRB and determining the steam enthalpy from steam pressure and temperature. The carbon dioxide emission factor will be determined by measuring the calorific value and the carbon content in coal.

No project emissions is anticipated from the project activity.

The energy efficiency equipment is not transferred from any other CDM project activity so no leakage is considered
$L_y = 0$

Hence, the emissions reductions equation is reduced to

$$ER_y = BE_y = Q_y \times EF_y$$

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

This section has been left blank on purpose.

B.6.3 Ex-ante calculation of emission reductions:

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$$ER_y = Q_y \times EF_y$$

On an average 12 TPH of saturated steam at 14.3 kg/cm2 (g) pressure is generated from the WHRB and supplied to the CCU and PVC plants. The water is supplied to the WHRB at 105 °C temperature. Therefore, Q_y can be estimated as:

Steam Pressure	**14.30**	kg/cm^2 (g)
Mass flow rate of Steam from WHRB	**12,000.00**	TPH
DM water inlet temperature (1.5 kg/cm2 (g))	**105.00**	degree C
Temperature of Saturated Steam	**200.00**	degree C
Enthalpy of Saturated Steam	**2,798.03**	kJ/kg
Enthalpy of DMW	**441.21**	kJ/kg
Efficiency of Coal fired Boiler	**85%**	%
Working days	**340**	days
Q_y	**271,505.88**	GJ

EF_y can be estimated as:

Calorific Value of Coal	**18,837.00**	kJ/kg of coal

Carbon content in Coal	**46%**	kg/kg of coal
CO2 / Carbon ratio (44/12)	**3.67**	-
EFy	**0.090**	tCO2/GJ

The emissions reduction by the project activity amount to 24,311tCO_2 per year.

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

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Year	Estimation of project activity emission reductions (tonnes of CO_2 e)	Estimation of baseline emission reductions (tonnes of CO_2 e)	Estimation of leakage (tonnes of CO_2 e)	Estimation of emission reductions (tonnes of CO_2 e)
2008	0	24,311	0	24,311
2009	0	24,311	0	24,311
2010	0	24,311	0	24,311
2011	0	24,311	0	24,311
2012	0	24,311	0	24,311
2013	0	24,311	0	24,311
2014	0	24,311	0	24,311
2015	0	24,311	0	24,311
2016	0	24,311	0	24,311
2017	0	24,311	0	24,311
Total	**0**	**243,110**	**0**	**243,110**

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

B.7.1 Data and parameters monitored:

Data / Parameter:	F_{steam}
Data unit:	Tonne/hr
Description:	Flow rate of steam
Source of data to be used:	Factory records
Value of data	12
Description of measurement methods and procedures to be applied:	Measured by steam flow meter and recorded in the log sheets by operators. This hourly data will be signed off at the end of every shift by the shift incharge. The engineer in charge will compile the daily report from the log books. The daily reports will be used to compile monthly reports.
QA/QC procedures to be applied:	Use of calibrated steam flow meter
Any comment:	Data will be held throughout the crediting period and 2 years thereafter.

Data / Parameter:	H_{boiler}
Data unit:	%
Description:	Efficiency
Source of data to be used:	Efficiency test report
Value of data	85%

Description of measurement methods and procedures to be applied:	Efficiency test to be performed by a certified agency.
QA/QC procedures to be applied:	The efficiency test should be performed as per the PTC code.
Any comment:	Data will be held throughout the crediting period and 2 years thereafter.

Data / Parameter:	$T_{steam, outlet}$
Data unit:	°C
Description:	Outlet steam temperature.
Source of data to be used:	Factory records
Value of data	200
Description of measurement methods and procedures to be applied:	Measured by a temperature indicator at the outlet of WHRB and recorded in the log sheets by operators. This hourly data will be signed off at the end of every shift by the shift incharge. The engineer in charge will compile the daily report from the log books. The daily reports will be used to compile monthly reports.
QA/QC procedures to be applied:	Use of calibrated instrument
Any comment:	Data will be held throughout the crediting period and 2 years thereafter.

Data / Parameter:	$P_{Pressure, outlet}$
Data unit:	Kg/cm^2 (g)
Description:	Outlet steam pressure.
Source of data to be used:	Factory records
Value of data	14.3
Description of measurement methods and procedures to be applied:	Measured by a pressure indicator at the outlet of WHRB and recorded in the log sheets by operators. This hourly data will be signed off at the end of every shift by the shift incharge. The engineer in charge will compile the daily report from the log books. The daily reports will be used to compile monthly reports.
QA/QC procedures to be applied:	Use of calibrated instrument
Any comment:	Data will be held throughout the crediting period and 2 years thereafter.

Data / Parameter:	$T_{water, intlet}$
Data unit:	°C
Description:	Inlet DM water temperature
Source of data to be used:	Factory records
Value of data	105
Description of measurement methods and procedures to be applied:	Measured by a temperature indicator at the inlet of WHRB and recorded in the log sheets by operators. This hourly data will be signed off at the end of every shift by the shift incharge. The engineer in charge will compile the daily report from the log books. The daily reports will be used to compile monthly reports.
QA/QC procedures to be applied:	Use of calibrated instrument

Any comment:	Data will be held throughout the crediting period and 2 years thereafter.

Data / Parameter:	CV_{coal}
Data unit:	kJ/kg of coal
Description:	Calorific value of coal
Source of data to be used:	Factory records
Value of data	18,837
Description of measurement methods and procedures to be applied:	Test results for samples of coal purchased. The tests are performed at the laboratory within the plant. The test results will be sent to carbide unit, where the value will be stored in with the other monitored parameters. For one year the average value of the all the samples tested will be taken. The engineer in charge will compile the test results for the samples once a month.
QA/QC procedures to be applied:	The test is to be performed as per standard procedures.
Any comment:	Data will be held throughout the crediting period and 2 years thereafter.

Data / Parameter:	$C\ Content_{coal}$
Data unit:	%
Description:	Carbon content in coal
Source of data to be used:	Factory records
Value of data	46
Description of measurement methods and procedures to be applied:	Test results for samples of coal purchased. The tests are performed at the laboratory within the plant. The test results will be sent to carbide unit, where the value will be stored in with the other monitored parameters. For one year the average value of the all the samples tested will be taken. The engineer in charge will compile the test results for the samples once a month.
QA/QC procedures to be applied:	The test is to be performed as per standard procedures.
Any comment:	Data will be held throughout the crediting period and 2 years thereafter.

Data / Parameter:	Quantity of Coal
Data unit:	kg per annum
Description:	Quantity of coal used in the main power plant
Source of data to be used:	Power Plant records
Value of data	3,448,248
Description of measurement methods and procedures to be applied:	Log sheets and fuel purchased receipts. The engineer in charge will compile the data once a month.
QA/QC procedures to be applied:	
Any comment:	Data will be held throughout the crediting period and 2 years thereafter.

B.7.2 Description of the monitoring plan:

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The overall CDM project manager for the proposed project activity will be the General Manager (GM) - Carbide. The GM will be supported by engineers in charge. The flow, pressure and temperature of steam generated from the WHRB will be monitored by operators in shift and put in the plant log sheets. Simultaneously, the calorific value and carbon content of sample of coal procured for the boilers will be determined at the plant laboratory. Steam totalizer will be installed at WHRB for recording net steam export to the other plants. One standby flow transmitter will be installed at the net steam export line. Total steam to coal ratio will be calculated form the monitored data of steam generated and coal purchased.

The management of the plant will designate one person to be responsible for the collation of data as per the monitoring methodology. The designated person will collect all data to be monitored as mentioned in this project design document (PDD) and will report to the Jt. Vice President (VP) of the plant. The overall responsibility for the timely reporting will remain with the Jt. VP

Mr. Sanjeev Mittal, Dy. G. M of the carbide plant will be maintaining all records pertaining to net steam export . The hourly recording of data will be done by shift operators that will be checked and verified by the In-charge of the respective fields at the end of each day. This data will be compiled as a daily report in the formats developed at the site by the Electrical, Mechanical and Instrumentations Incharge and will be cross checked by Dy. G.M. This daily report will then be sent to Mr. Jabar Singh, Jt. VP for verification. The daily reports will be used collectively to prepare a monthly report. The monthly report will be prepared by Dy. GM and send to plant Jt. VP for verification. The monthly will be reviewed by Mr. Rajat Mukherjei, Sr. VP and Business Head (Plastics) during the quarterly review meeting. The monthly reports will be sent to the consultant (DSCL Energy Services Company Ltd) for estimation of monthly emission reductions. The monitoring personnel currently maintain and review the factory records pertaining to the net export of steam from WHRB. They are familiar with the process of monitoring and documentation; however, their training needs will be identified and attended. The meters used for data recording will be calibrated annually as per the current practice and they will be maintained as per the instructions provided by their suppliers. Hence there are no uncertainties or adjustments associated with data to be monitored.

Emergency preparedness plans have been laid out to meet with situations leading to unintended emissions as the Plant is certified for OHSAS 18000 (Occupational Health and Safety Management System) and ISO 14001 (specifies the actual requirements for an environmental management system. It applies to those environmental aspects which the organization has control and over which it can be expected to have an influence) so the emergency preparedness and environmental management of the plant is taken care of.

The plant is certified through ISO 9001:2000.(Quality Management System) and so the report is archived manually as well as electronically. The meters used for data recording will be calibrated annually as per the current practice. Hence there are no uncertainties or adjustments associated with data to be monitored. An internal team will review the daily reports, monthly reports, procedure for data recording and maintenance reports of the meters. This team will check whether all records are being maintained as per the details provided in the PDD. All the data and reports will be kept at the offices of the Carbide Plant until 2 years after the end of the crediting period or the last issuance of CERs for the project activity, whichever occurs later.

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

>>

Baseline and monitoring section completed
On 14/07/2007
By Mr. Rajat Mukerjei and Mr. Paramdeep Singh, contact details listed 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:

>>
24/09/2004

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

>>
20 years 00 months

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

>>
A fixed ten year crediting period has been chosen

C.2.1. Renewable crediting period

>>
Not applicable

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:

>>
Chosen Crediting period

C.2.2.1. Starting date:

>>
03/01/2008 or the project registration date whichever is later

C.2.2.2. Length:

>>
10 years 00 months

SECTION D. Environmental impacts

>>

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

>>

The proposed project activity will not result in any negative environmental impacts.

The positive environmental impacts arising from the project activity are:

1. A recovery of heat from flue gases generated in the furnace.
2. A reduction in carbon dioxide emissions from the replacement of fossil fuels which would be generated under the baseline scenario
3. A reduction in the emissions of other harmful gases (NOx and SOx) that arise from the combustion of coal

The proposed project activity meets all the environmental guidelines and regulations as set out by the regional and national environmental agencies. The Rajasthan Pollution Control Board has been notified of the project activity and due care has been taken in obtaining the consents and approvals required for installation and operation of the project activity.

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:

>>

Not applicable.

SECTION E. Stakeholders' comments

>>

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

>>

The local population are considered the major stakeholders with respect to the project activity. The consent of the local stakeholders has been sought for by:

1. Publishing a notification of the project activity in a local newspaper.
2. Organising a stakeholder meeting at the project site which was attended by 25 to 30 people.

The other stakeholders consulted are Rajasthan Pollution Control Board and Local Boiler Inspector.

A national stakeholder review will be done by getting the approval form Ministry of Environment and Forests, the Designated National Authority. An international stakeholder review will be done by web hosting the PDD at the time of validation.

E.2. Summary of the comments received:

>>

To date no adverse comments have been received.

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

>>

Details for the proceedings of the stakeholders meeting will be provided at the time of validation.

Annex 1

CONTACT INFORMATION ON PARTICIPANTS IN THE PROJECT ACTIVITY

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Represented by:	
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Represented by:	-
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Annex 2

INFORMATION REGARDING PUBLIC FUNDING

The project has received no public funding.

Annex 3

BASELINE INFORMATION

See section B.4 for baseline data.

Annex 4

MONITORING INFORMATION

The monitoring plan has been described in section B.7.2.

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