Indur 7.5 MW Non-Conventional Renewable Sources Biomass Power Project

Project Reference Number: 0391

MONITORING REPORT

VERSION - 01, DATED – 8th June 2010

Fourth Periodic Verification under the Clean Development Mechanism (CDM)

FOR THE MONITORING PERIOD

1st APRIL 2009 to 15th February 2010 (both days are included)

Net Emission Reductions: 24941 tCO_2

Registered Office	**Project Site**
INDUR GREEN POWER PRIVTAE LIMITED #8-2-684/2/A, Flat No.1 to 4, NSL Icon 4th Floor, Road No.12, Banjara Hills, Hyderabad – 500 034 Andhra Pradesh Ph: 040 – 23327949 Fax: 040 – 23327919 e-mail: igppl@yahoo.com	**INDUR GREEN POWER PRIVATE LIMITED** Opp. 132/33Kv Sub-Station, Renjal (V&M), Nizambad (Dist) Andhra Pradesh Ph: 08467 – 276515 Fax: 08467 – 276515 e-mail: igppl_site@yahoo.com

Current Status of the Project

Indur Green Power Private Limited (IGPPL) 7.5 MW Non-Conventional Renewable Sources Biomass Power Project is located at Renjal (V&M), Bodhan Taluk, Nizamabad District of Andhra Pradesh, India. Project was commissioned on 15th February 2003 at 5:20 Hrs. Since then the plant is in operation. The project was registered with UNFCCC on 10th June 2006 and has received three issuances of CERs in 2007, 2008 and 2010 as shown below.

Monitoring period: 16th February 2003 to 31st March 2006	103675 CERs issued on 8th January 2007
Monitoring period: 1st April 2006 to 31st March 2007	27898 CERs issued on 28th February 2008
Monitoring period: 1st April 2007 to 31st March 2009	56997 CERs issued on 23rd April 2010

The project proponent has chosen a renewal crediting period of 7 years for this project activity. The first crediting period for this project activity is from 16th February 2003 to 15th February 2010. The monitoring period for the fourth verification is from 1st April 2009 (00:00 Hrs) to 15th of February 2010 (00:00 Hrs) (till the end of the first crediting period). The project is currently under validation for renewal of crediting period.

Type of the project activity

As per Clause 2 of Type I.D of Appendix B of Simplified **modalities and procedures for small-scale CDM project activities**, in case of unit which co-fires renewable biomass and fossil fuel the capacity of the entire unit shall not exceed the limit of 15 MW, for the project to qualify as a small –scale CDM project. Therefore, the project activity can be defined under:

Main Category: Type I – Renewable Energy Project (Small Scale)

Sub Category: "D", Renewable Electricity Generation for a Grid, Version - 07

Host Party: India

References

Baseline Methodology: The project applies the baseline methodology AMS-I.D, Version 07

Registered PDD, dated 6th February 2006:
http://cdm.unfccc.int/UserManagement/FileStorage/KIDEPY97FT6FOWHTGIVEFPXNM2KBLO

Validation Report:
http://cdm.unfccc.int/UserManagement/FileStorage/XPZFAFYF5W83XXMPSAPR2CNEDDII8Q

Monitoring methodology applied: AMS-I.D is considered as basis for monitoring methodology for the activity, Version 07

Revised Monitoring plan:
http://cdm.unfccc.int/UserManagement/FileStorage/JMAIXUWYCDTF94O7HPKZ2ESL5RN61G

Date of registration: 10 June 2006

UNFCCC link for project activity (Reference No.: 0391): http://cdm.unfccc.int/Projects/DB/DNV-CUK1146051603.73/view

Monitoring Period

The present monitoring period covers the project activity from 1st April 2009 to 15th February 2010, both days inclusive.

During the period from 1st April 2009 (00:00 Hrs) to 15th February 2010 (00:00 Hrs) for commercial operations, plant exported 30228.90 MWh of electricity to APTRANSCO grid and consumed 44486.00 MT of renewable biomass fuels.

Statement showing details of outages forced and planned shutdown period

Plant is in operation continuously (with outages, forced and planned shutdowns) from 1st April 2009 (00:00 Hrs) to 15th February 2010 (00:00 Hrs). The details of outages, forced and planned shutdown periods are as below:

Period	**1st April 2009 to 15th February 2010**
Total Number of available working days	321 days 00 hours 00 minutes
Number of planned shutdowns including Shutdown days after completion of monthly target	67 days 20 hours 110 minutes
Number of forced shutdowns	30 days 133 hours 420 minutes
Total shutdown days	103 days 17 hours 50 minutes
Total Shut down for the monitoring period	**103 days 17 hours 50 minutes**

Planned and Forced Shutdown days for the period 1st April 2009 (00:00 Hrs) to 15th February 2010 (00:00 Hrs)										
PERIOD		**SHUTDOWN DAYS**								
From	**To**	**Planned**			**Forced**			**Total**		
		Days	**Hours**	**Minutes**	**Days**	**Hours**	**Minutes**	**Days**	**Hours**	**Minutes**
01-Apr-09	24-Apr-09	0	0	0	4	23	45	4	23	45
24-Apr-09	24-May-09	2	4	43	1	5	49	3	9	92
24-May-09	24-Jun-09	0	0	0	5	17	39	5	17	39
24-Jun-09	24-Jul-09	0	0	0	1	17	58	1	17	58
24-Jul-09	24-Aug-09	0	0	0	0	21	52	0	21	52
24-Aug-09	24-Sep-09	9	12	27	1	9	30	10	21	57
24-Sep-09	24-Oct-09	30	0	0	0	0	0	30	0	0
24-Oct-09	24-Nov-09	25	4	10	1	2	6	26	6	16
24-Nov-09	24-Dec-09	0	0	0	7	9	58	7	9	58
24-Dec-09	24-Jan-10	1	0	30	2	18	48	3	18	78
24-Jan-10	15-Feb-10	0	0	0	8	12	35	8	12	35
Total		**67**	**20**	**110**	**30**	**133**	**420**	**97**	**153**	**530**

Parameters being monitored in accordance with the approved Revised Monitoring Plan

In accordance with the approved revised monitoring plan, following parameters are being monitored for the project activity:

Sl. No	Parameter	Procedure
1	***Electricity Generation (in kWh)***	Power generated in the plant is measured using the energy meter installed in the plant on continuous basis. The total generated power is also used to compare the auxiliary consumption of the plant after deducting the power exported to the grid from total generation.
2	***Auxiliary consumption (in kWh)***	Power consumed by auxiliaries at the plant is measured as the difference between total electricity generated and electricity exported to the grid.
3	***Power Export (in kWh)***	Power exported to the grid is monitored from energy meters installed at APTRANSCO sub-station on ***24th*** day of every month. Representatives of APTRANSCO and IGPPL will record the meter readings jointly for the energy exported to the Grid. Both the parties will jointly sign the recorded readings as a proof of export of Power to the grid from IGPPL plant. These meter readings are the basis for the invoices raised by ***Indur Green Power Private Limited***.
4	***Power Import in kWh***	Power imported from the grid is monitored from energy meters installed at APTRANSCO sub-station on ***24th*** day of every month. Representatives of APTRANSCO and IGPPL are recording meter readings jointly for the energy imported from the Grid. Both the parties will jointly sign the recorded readings as a proof of import of Power from APTRANSCO grid by the power plant. These meter readings are the basis for the invoices raised by ***Indur Green Power Private Limited.***
5	***Biomass Fuel (of all kinds) in MT***	On receipt of Biomass fuel to the Plant, the vehicles are weighed on 40T Electronic Weigh Bridge installed at the entrance of the Plant and these will unloaded the biomass in the fuel storage yards. The biomass fuel after necessary preparation is fed to the Boiler through Belt Conveyor as per the requirement and consumption will be recorded on daily basis. During this monitoring period, Plant used Rice Husk and other Agricultural Waste Residues for the purpose of electricity generation.
6	***Calorific value of the Biomass fuel (of all kinds) in kCal/Kg***	The calorific value of the Biomass fuels being used is measured in the in-house laboratory on daily basis as per the arrivals and average value will be considered on monthly basis.
7	***Diesel in Liters***	Diesel consumption will be monitored based on daily basis using dip stick method.

8	***Average Calorific value of Diesel***	IPCC default value of 43.0 TJ/Gg considered for estimation of emission reductions. Source: 2006 IPCC Guidelines for National Greenhouse Gases Inventories (Volume 2, Table 1.2, Page 1.18), http://www.ipcc-nggip.iges.or.jp/public/2006gl/index.html
9	***Density of Diesel***	National Default Value of 0.83t/1000 Lit is considered. Source: CEA CDM database, Version -5, http://www.cea.nic.in/planning/c%20and%20e/database_publishing_ver5.zip
10	***Oxidation Factor of Diesel***	A default value of 1.0 is applied. Source: 2006 IPCC Guidelines for National Greenhouse Gases Inventories
11	***Coal in MT***	Coal will be fed to the boiler as and when required and consumption will be recorded accordingly. As of now, no coal is being used in the plant for the purpose of electricity generation.
12	***Carbon content in coal***	No coal is used for the monitoring period. Hence, no analysis of coal was conducted for estimating carbon content in coal.
13	***Calorific Value of Coal***	No coal is used for the monitoring period. Hence, no analysis of coal was conducted for estimating calorific value of the coal.

Power Generation, Export, Import & Fuel Consumption

Month-wise data on Power Generation, export, import, fuel consumption and diesel consumption during the monitoring period is given below:

Period		**Electricity Generated, kWh**	**Electricity Exported, kWh**	**Electricity Imported, kWh**	**Total Biomass used, MT**	**Coal Used, MT**	**Diesel consumption, lit**
From	**To**						
1st April 2009 to 15th February 2010							
01-Apr-09	24-Apr-09	2753800	2411900	18500	3649	0	13
24-Apr-09	24-May-09	4325900	3792500	10300	5209	0	19
24-May-09	24-Jun-09	4112000	3622100	12700	4933	0	39
24-Jun-09	24-Jul- 09	4494000	3931300	5900	5321	0	21
24-Jul- 09	24-Aug-09	4644700	4062100	4000	5708	0	53
24-Aug-09	24-Sep-09	2621300	2240200	17200	3660	0	8
24-Sep-09	24-Oct-09	0	0	27600	0	0	37
24-Oct-09	24-Nov-09	711000	626100	32500	1061	0	135

Period		Electricity Generated, kWh	Electricity Exported, kWh	Electricity Imported, kWh	Total Biomass used, MT	Coal Used, MT	Diesel consumption, lit
From	To						
24-Nov-09	24-Dec-09	3724400	3275900	21500	5127	0	44
24-Dec-09	24-Jan-10	4592500	4062200	10800	6342	0	116
24-Jan-10	15-Feb-10	2498400	2204600	17075	3476	0	75
Total for 2009-2010		**34478000**	**30228900**	**178075**	**44486**	**0**	**560**

Monthly break up of total biomass consumption and average monthly NCVs of each type of biomass is enclosed in **Annexure-II** of the monitoring report.

Emission Reductions

Emission reductions are calculated based on the power exported to the grid, power imported from the grid during shut down and start-up, and diesel consumed in the plant from 01st April 2009 to 15th February 2010.

Baseline and project emissions are calculated as per the formulas and default values as mentioned in approved Revised Monitoring Plan. The same is given below:

Emissions	Formula used
Baseline emissions	= Electricity exported to the grid (kWh) x grid emission factor (tCO_2/kWh)
Project emissions	
Due to coal consumption	= Actual Coal consumed in MT x % carbon in coal x (44/12)
Due to diesel consumption	= [(Diesel consumed in liters x calorific value (TJ/kg) x density of fuel (kg/l))] x IPCC emission factor (tCO_2/TJ) x oxidation factor
Due to import of power from Grid	= Electricity imported from grid (kWh) x grid emission factor (tCO_2/kWh)

Grid Emission Factor (Ex-ante value as per registered PDD)	= **0.830 tCO2/MWh**
Net Calorific Value of Diesel (Default value as per revised Monitoring Plan)	= **43.0 TJ/Gg**
Density of Diesel (Default Value as per Revised monitoring plan)	= **0.83 t/1000 Lit**
IPCC Emission factor	= **74.1 tCO2/TJ**
Oxidation Factor of Diesel	= **1**

The detailed calculation sheet for CERs is given in **Annexure – I** of the monitoring report.

Comparison of emission reductions claimed in the monitoring report with those in approved Revised Monitoring Plan

1st April 2009 to 15th February 2010			
	Baseline Emissions (tonnes of CO_2)	**Project Emissions (tonnes of CO_2)**	**Emission Reductions (tonnes of CO_2)**
Emission reductions in Approved Revised Monitoring Plan (Same as those in registered PDD)[1]	35116	0	35116
Emission reductions claimed in the monitoring report	25090	149	24941
Explanation: Emissions reductions claimed in the monitoring report are lower than those estimated in the registered PDD. The difference is due to lesser number of operating days for the project during the period 1st April 2009 (00:00 Hrs) to 15th February 2010 (00:00 Hrs) (217 days as against 330 days used to arrive at electricity generation estimation in registered PDD).			

Measures to Ensure the Results / Uncertainty Analysis

The energy generated by the plant is recorded from the generation meter located in the control room of the plant. The main generation meter is calibrated once a year. As per the Power Purchase Agreement (PPA), the energy exported to the AP Grid is recorded by two independent meters viz., Main Meter and Check Meter and main meter reading is used for billing. In the event of failure/ non operation of the main meter, the check meter reading shall be used for billing. The calibration of monitoring equipment is being maintained as per the requirement of APTRANSCO. Details of calibration of energy meters and weighbridge are as follows.

Sl No	Type	Make	Serial Number of the meter	Accuracy/Uncertainty Level	Date of calibration	Validity
1	Generation Meter	ENERCON	F40/2151-0902	±1.0%	29/12/2008	One year
					13/11/2009	One year

[1] As per revised monitoring plan the CERs are calculated for 330 days of operation of the power plant

Sl No	Type	Make	Serial Number of the meter	Accuracy/Uncertainty Level	Date of calibration	Validity
2	Export & Import Meter (Main Meter)	Secure	GEC05460	±0.2%	06/11/2008 23/12/2009	Under the purview of APTRANSCO
3	Export & Import Meter (Check Meter)	Secure	GEC05461	±0.2%	06/11/2008 23/12/2009	Under the purview of APTRANSCO
4	Weighbridge	Statweigh India Private Limited	2K2009	±5 kgs	29/09/2008 06/10/2009	One year (up to 28/09/09) One year (up to 05/10/10)

Power Generation, Export & Auxiliary Consumption, fuel consumption are being recorded daily and the same is being verified by General Manager and it will be approved by Plant Manager. Internal audits are carried out by CDM team members every quarter in order to ensure that monitoring of the parameters is done as per the PDD and revised monitoring plan. Experts and consultants of Indur Green Power Private Limited also assisted CDM team in monitoring of the parameters as per monitoring plan.

Roles & Responsibilities

A CDM team has been formed in Indur Green Power Private Limited for monitoring and verification of all the monitoring parameters as per the guidelines formulated by the management of Indur Green Power Private Limited. Qualified and trained people monitor the parameters and emission reduction calculations. In the complete implementation and monitoring plan, Indur Green Power Private Limited is the sole agency responsible for implementation and monitoring.

Members of CDM Team

a) P. Praveen, General Manager
b) A. Sai Mogili, Manager (O&M)
c) J. Bhavani Shankar, Sr. Electrical Engineer
d) H. Ravi Kumar, Accounts Officer
e) N. Bhooma Reddy, Chemist

Annexure – I:

CER Calculations

Period From	Period To	Electricity Generated, kWh	Electricity Exported, kWh	Electricity Imported, kWh	Auxiliary Consumption, kWh	Total Biomass - MTs.	Coal Used, MT	Raw Material Total, MT	% Carbon in Coal	Emission Factor, kgCO2/ kWh	Baseline Emissions, tCo2e	Diesel consumption , lit	CO2 emissions from diesel considering IPCC's oxidation factor of diesel as 1.0 tCO2/TJ	Project Emissions, tCO2e				Emission Reductions, tCo_2e
														Due to consumption of Diesel	Due to consumption of Coal	Due to import of Power	Total	
1-Apr-09	24-Apr-09	2753800	2411900	18500	341900	3649	0	3649	0	0.83	2002	13	74.1	0.03	0.00	15.36	15.4	1986
24-Apr-09	24-May-09	4325900	3792500	10300	533400	5209	0	5209	0	0.83	3148	19	74.1	0.05	0.00	8.55	8.6	3139
24-May-09	24-Jun-09	4112000	3622100	12700	489900	4933	0	4933	0	0.83	3006	39	74.1	0.10	0.00	10.54	10.6	2996
24-Jun-09	24-Jul-09	4494000	3931300	5900	562700	5321	0	5321	0	0.83	3263	21	74.1	0.06	0.00	4.90	5.0	3258
24-Jul-09	24-Aug-09	4644700	4062100	4000	582600	5708	0	5708	0	0.83	3372	53	74.1	0.14	0.00	3.32	3.5	3368
24-Aug-09	24-Sep-09	2621300	2240200	17200	381100	3660	0	3660	0	0.83	1859	8	74.1	0.02	0.00	14.28	14.3	1845
24-Sep-09	24-Oct-09	0	0	27600	0	0	0	0	0	0.83	0	37	74.1	0.10	0.00	22.91	23.0	-23
24-Oct-09	24-Nov-09	711000	626100	32500	84900	1061	0	1061	0	0.83	520	135	74.1	0.36	0.00	26.98	27.3	492
24-Nov-09	24-Dec-09	3724400	3275900	21500	448500	5127	0	5127	0	0.83	2719	44	74.1	0.12	0.00	17.85	18.0	2701
24-Dec-09	24-Jan-10	4,592,500	4062200	10800	530300	6342	0	6342	0	0.83	3372	116	74.1	0.31	0.00	8.96	9.3	3362
24-Jan-10	15-Feb-10	2,498,400	2204600	17075	293800	3476	0	3476	0	0.83	1830	75	74.1	0.20	0.00	14.17	14.4	1815
TOTAL		**34,478,000**	**30228900**	**178075**	**4249100**	**44486**	**0**	**44486**	**0**		**25090**	**560**		**1.48**	**0.0**	**148**	**149.3**	**24941**

Annexure – II

Monthly break up of total biomass consumption and average monthly NCVs of each type of biomass for the period 1st April 2009 to 15th February 2010

Period		Husk		Agriwaste		Total Biomass used, M.T
From	To	Qty, (MT)	NCV,(kcal/kg)	Qty, (MT)	NCV,(kcal/kg)	
1-Apr-09	24-Apr-09	3313	3046	336	3012	3649
24-Apr-09	24-May-09	5185	3028	24	2870	5209
24-May-09	24-Jun-09	4933	2998	0	0	4933
24-Jun-09	24-Jul-09	5321	3021	0	0	5321
24-Jul-09	24-Aug-09	5708	3089	0	0	5708
24-Aug-09	24-Sep-09	3660	3061	0	0	3660
24-Sep-09	24-Oct-09	0	0	0	0	0
24-Oct-09	24-Nov-09	1061	2976	0	0	1061
24-Nov-09	24-Dec-09	5127	3012	0	0	5127
24-Dec-09	24-Jan-10	6342	3048	0	0	6342
24-Jan-10	15-Feb-10	3229	3056	247	2850	3476
TOTAL		**43879**		**607**		**44486**