

MONITORING REPORT

August 2006

INDUR 7.5 MW Non Conventional Renewable Sources Biomass Power Project

Reference No. UNFCCC 0391

INDUR GREEN POWER PRIVATE LIMITED

Plant Address

INDUR GREEN POWER PVT. LIMITED

Opp. 132/33Kv Sub-Station,
Renjal (V&M), Nizambad (Dist)
Andhra Pradesh

Ph : 08467 – 276515

Fax : 08467 - 276515

Registered Office

INDUR GREEN POWER PVT. LIMITED

#3-5-821, 1st Floor, Doshi Squares,
Hyderguda, Hyderabad – 500 029
Andhra Pradesh.

Ph : 040 – 23211200

Fax : 040 - 55669066

e-mail: igppl@yahoo.com

CURRENT STATUS OF THE PROJECT

INDUR 7.5 MW Non-Conventional Renewable Sources Biomass Power Project is located at Renjal (V&M), Bodhan Taluk, Nizamabad (Dist) of Andhra Pradesh, India.

Project has been commissioned on 15th Feb 2003 at 5:20Hrs, since then the plant is in Operation.

First Synchronization of the Project with 132/33KV Sub-station at Renjal (AP TRANSCO grid) was performed on **7th February 2003**. After trial operation and after obtaining permission for commercial operations, plant exported **13,11,82,200 Units** to APTRANSCO grid and consumed **1,99,035 MT** of Biomass fuel and **3,716.000 MT** of coal since beginning of the plant operation to till **31st March 2006**.

List of Vendors who supplied major equipments to the Plant is given below

<u>S. No</u>	<u>Equipment</u>	<u>Supplied by</u>
1	Boiler	ISGEC JHON THOMPSON (IJT)
2	Turbo-Generator Set	TRIVENI ENGG. & INDUSTRIES LIMITED
3	Electrical Distribution	ALSTOM LIMITED
4	Distributed Control System	ABB LIMITED
5	Cooling Tower	SRI RAM TOWER TECH
6	R.O Plant	DOSHI ION EXCHANGE & CHEMICAL INDUSTRIES LIMITED
7	Air Compressors	CHICAGO PNEUMATIC
8	Fuel Handling System	HYQUIP PROJECTS PVT. LIMITED

Plant obtained Term loans from financial institutions namely

- 1) STATE BANK OF INDIA
- 2) POWER FINANCE CORPORATION LIMITED

Statement to what extent the Project has been implemented as planned

The Project has been completed as planned and described in the Project Design Document (PDD).

Plant is in operation continuously (with outages, forced & planned shutdowns) since **15th February 2003** details as mentioned below

Statement showing the outages, forced & planned shutdown particulars

Total Number of available working days	1,141 days
Number of planned shutdowns	147 days 15 minutes
Number of forced shutdowns	78 days 11 minutes
Total shutdown days	225 days 26 minutes

Major Shutdown days

S.No	Period	Days	Reason for shutdown
1.	From 01.04.04 to 15.04.04 (Planned)	14 days	T.G Rotor repairs & Annual Maintenance Work
2.	From 19.12.04 to 30.12.04 (Planned)	11 days	Cooling Tower fills repair work
3.	From 11.02.05 to 16.03.05 (Planned)	10 days	Boiler Economiser Coil repair & Annual Maintenance work
4.	From 20.12.05 to 30.12.05 (Planned)	10 days	Boiler roof repair works

Plant is using Biomass fuels like Rice Husk, Juliflora, and other Agri. Waste Residues (like Stalks of Cotton, Bengalgram, Redgram, Blackgram Sunflower and Trashes of Soyabean, Ground Nut Shell etc.) of biomass fuels and supplementary fuel like coal (less than the permitted quantity). In addition to that, plant also uses small quantity of diesel very occasionally for operating the D.G set for safety of equipment during Grid Power failure time.

The Monitoring period is chosen from

16th February 2003 to 31st March 2006
(Both days included).

Sustainability – Economic and Social well-being

The Company has spent around INR **20,38,78,268.00** (US\$ **4.43** million @ US\$ = Rs 46/-) during the monitoring period towards fuel usage in the Plant. Procurement of biomass fuel from local farmers and biomass suppliers has generated additional income and improved economic condition of the community.

Indur Green Power Private Limited has resulted in local employment generation. Plant has generated direct employment opportunities of 200 persons and indirectly to more than 500 persons.

As a part of social responsibility, Plant has been contributing to social infrastructure by way of employing local people for the plant operations and also generating additional income of around Rs. 700/- per acre to the farmers by way of purchase of Agri. Waste residues, which were otherwise burnt in the fields. IGPPL is also paying significant amount as tax for the local panchayats.

Parameters being monitored according to Monitoring Plan

Sl. No	Parameter	Procedure
1	Power Generation	Power generated in the plant is measured using the energy meter installed in the plant on continuous basis and the same is being compared with the electricity exported every month. This is done to compare the auxiliary consumption in the plant with the energy meters installed to measure auxiliary consumption.
2	<i>Power Export and Import</i>	Power exported to the grid and 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 being recording 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 and import of Power from APTRANSCO grid by the power plant. These meter readings are the basis for the invoices raised by <i>Indur Green Power Private Limited</i>
3	<i>Biomass Fuel</i>	On receipt of Biomass fuel to the Plant, the vehicles will weighed on 40T Electronic Weigh Bridge installed at the entrance of the Plant and these will unloaded 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
4	<i>Calorific value of the Biomass fuel</i>	The calorific value of the Biomass fuel 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.
5	<i>Coal/Diesel</i>	On receipt of Coal, the vehicles will be unloaded in Coal Yard and the same will be fed to the Boiler as and when required and consumption will be recorded accordingly. Diesel consumption will be monitored on regular basis using dip stock method
6	<i>Carbon content in coal</i>	Carbon content and CV in the coal received is measured in the in-house & External laboratories as per the standard formula.

Power Generation, Export & Fuel Consumption

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

Period		Electricity Generated, Units	Electricity Exported, Units	Electricity Imported, Units	Total Biomass used, MT	Coal Used, MT	Diesel consumption , lit
From	To						
Trial Period					400		
16-Feb-03	24-Feb-03	804800	703200	15100	1055	0	50
24-Feb-03	24-Mar-03	2920100	2561700	28000	3850	0	80
24-Mar-03	31-Mar-03	998700	890800	2600	1285	0	20
31-Mar-03	24-Apr-03	3047300	2732500	15700	3722	0	160
24-Apr-03	24-May-03	2954800	2606300	32600	3882	0	140
24-May-03	24-Jun-03	4468900	4014000	17900	6067	0	35
24-Jun-03	24-Jul-03	3512360	3134300	35100	4905	0	35
24-Jul-03	24-Aug-03	3980200	3514700	25400	5599	0	30
24-Aug-03	24-Sep-03	4513800	4017000	11900	6316	0	60
24-Sep-03	24-Oct-03	4363400	3887200	16300	6097	0	70
24-Oct-03	24-Nov-03	4446940	3944400	22100	6539	0	13
24-Nov-03	24-Dec-03	3652900	3249800	13800	4543	660	30
24-Dec-03	24-Jan-04	4603900	4099900	9100	6585	0	58
24-Jan-04	24-Feb-04	4437600	3968200	20200	6454	0	26
24-Feb-04	24-Mar-04	4304900	3842200	10600	6635	0	47
24-Mar-04	31-Mar-04	1118200	994400	3400	1737	0	53
31-Mar-04	24-Apr-04	1719000	1549700	21900	2307	0	38
24-Apr-04	24-May-04	3938000	3555800	33900	5458	0	42
24-May-04	24-Jun-04	4525500	4062000	15000	6362	0	66
24-Jun-04	24-Jul-04	4445000	3931100	4000	5705	0	24
24-Jul-04	24-Aug-04	4574400	4059700	9800	5829	0	64
24-Aug-04	24-Sep-04	4523800	4030700	9100	6163	0	41
24-Sep-04	24-Oct-04	4387100	3929000	11700	5245	810	61
24-Oct-04	24-Nov-04	3931400	3476600	26200	4994	483	48

Indur Green Power Private Limited

24-Nov-04	24-Dec-04	3979400	3530600	10200	5283	0	30
24-Dec-04	24-Jan-05	3735100	3336800	24500	4583	184	65
24-Jan-05	24-Feb-05	2505900	2206300	14400	3193	135	50
24-Feb-05	24-Mar-05	1142300	1017400	30300	1462	148	45
24-Mar-05	31-Mar-05	1152500	1022400	2900	1406	40	5
31-Mar-05	24-Apr-05	3086700	2730600	13600	4277	0	25
24-Apr-05	24-May-05	4016800	3547900	10900	7812	0	30
24-May-05	24-Jun-05	4274800	3762500	7000	5350	116	14
24-Jun-05	24-Jul-05	4182000	3677400	3100	4853	0	86
24-Jul-05	24-Aug-05	3853700	3386800	19500	4364	0	74
24-Aug-05	24-Sep-05	4316000	3800400	4600	4918	511	37
24-Sep-05	24-Oct-05	3143700	2745700	15300	4214	0	28
24-Oct-05	24-Nov-05	4253400	3762800	14100	5510	629	26
24-Nov-05	24-Dec-05	4272800	3802500	9000	5713	0	30
24-Dec-05	24-Jan-06	4226400	3780100	13800	5368	0	25
24-Jan-06	24-Feb-06	4486600	4001300	12700	6035	0	27
24-Feb-06	24-Mar-06	3869800	3414500	10700	5787	0	30
24-Mar-06	31-Mar-06	1030400	901000	2600	1572	0	5
GRAND TOTAL		147701300	131182200	630600	199035*	3716	1923

*Excluding consumption of 400 Mts of Bio-mass during trial period .

Generation meter readings taken on 16.2.2003 (one day after of actual start of Production i.e.15.2.2003

Note: 1) The above values are taken from 24th to 24th of Every Month (Billing Month Basis).

Emission Reductions

The emission reductions per year during monitoring period are as given below:

Emission reductions are calculated based on the power exported to the grid, power imported from the grid during shut down and start up, coal and diesel consumed in the plant from **15th February 2003** to **31st March 2006** as per validation report.

Period		Electricity Generated, Units	Electricity Exported, Units	Electricity Imported, Units	Total Biomass used, MT	Coal Used, MT	Diesel consumption, lit	Net Emission Reductions/C ERS
From	To							
Year - 1								
16-Feb-03	24-Feb-03	804800	703200	15100	1055	0	50	571
24-Feb-03	24-Mar-03	2920100	2561700	28000	3850	0	80	2103
24-Mar-03	31-Mar-03	998700	890800	2600	1285	0	20	737
Total		4723600	4155700	45700	6190	0	150	3411
Year – 2								
31-Mar-03	24-Apr-03	3047300	2732500	15700	3722	0	160	2255
24-Apr-03	24-May-03	2954800	2606300	32600	3882	0	140	2136
24-May-03	24-Jun-03	4468900	4014000	17900	6067	0	35	3317
24-Jun-03	24-Jul-03	3512360	3134300	35100	4905	0	35	2572
24-Jul-03	24-Aug-03	3980200	3514700	25400	5599	0	30	2896
24-Aug-03	24-Sep-03	4513800	4017000	11900	6316	0	60	3324
24-Sep-03	24-Oct-03	4363400	3887200	16300	6097	0	70	3213
24-Oct-03	24-Nov-03	4446940	3944400	22100	6539	0	13	3255
24-Nov-03	24-Dec-03	3652900	3249800	13800	4543	660	30	1731
24-Dec-03	24-Jan-04	4603900	4099900	9100	6585	0	58	3395
24-Jan-04	24-Feb-04	4437600	3968200	20200	6454	0	26	3277
24-Feb-04	24-Mar-04	4304900	3842200	10600	6635	0	47	3180
24-Mar-04	31-Mar-04	1118200	994400	3400	1737	0	53	822
Total		49405200	44004900	234100	69081	660	757	35373

Indur Green Power Private Limited

Year – 3								
31-Mar-04	24-Apr-04	1719000	1549700	21900	2307	0	38	1268
24-Apr-04	24-May-04	3938000	3555800	33900	5458	0	42	2923
24-May-04	24-Jun-04	4525500	4062000	15000	6362	0	66	3359
24-Jun-04	24-Jul-04	4445000	3931100	4000	5705	0	24	3259
24-Jul-04	24-Aug-04	4574400	4059700	9800	5829	0	64	3361
24-Aug-04	24-Sep-04	4523800	4030700	9100	6163	0	41	3338
24-Sep-04	24-Oct-04	4387100	3929000	11700	5245	810	61	2318
24-Oct-04	24-Nov-04	3931400	3476600	26200	4994	483	48	2307
24-Nov-04	24-Dec-04	3979400	3530600	10200	5283	0	30	2922
24-Dec-04	24-Jan-05	3735100	3336800	24500	4583	184	65	2490
24-Jan-05	24-Feb-05	2505900	2206300	14400	3193	135	50	1629
24-Feb-05	24-Mar-05	1142300	1017400	30300	1462	148	45	611
24-Mar-05	31-Mar-05	1152500	1022400	2900	1406	40	5	790
Total		44559400	39708100	213900	57991	1800	579	30576
Year – 4								
31-Mar-05	24-Apr-05	3086700	2730600	13600	4277	0	25	2255
24-Apr-05	24-May-05	4016800	3547900	10900	7812	0	30	2936
24-May-05	24-Jun-05	4274800	3762500	7000	5350	116	14	2954
24-Jun-05	24-Jul-05	4182000	3677400	3100	4853	0	86	3049
24-Jul-05	24-Aug-05	3853700	3386800	19500	4364	0	74	2795
24-Aug-05	24-Sep-05	4316000	3800400	4600	4918	511	37	2581
24-Sep-05	24-Oct-05	3143700	2745700	15300	4214	0	28	2266
24-Oct-05	24-Nov-05	4253400	3762800	14100	5510	629	26	2411
24-Nov-05	24-Dec-05	4272800	3802500	9000	5713	0	30	3149
24-Dec-05	24-Jan-06	4226400	3780100	13800	5368	0	25	3126
24-Jan-06	24-Feb-06	4486600	4001300	12700	6035	0	27	3310
24-Feb-06	24-Mar-06	3869800	3414500	10700	5787	0	30	2825
24-Mar-06	31-Mar-06	1030400	901000	2600	1572	0	5	746
Total		49013100	43313500	136900	65773	1256	437	34403
GRAND TOTAL		147701300	131182200	630600	199035	3716	1923	103763

Generation meter reading taken one day (16.2.2003) after the actual date commencement of production (i.e.15.02.2003.)

Emissions due to usage of diesel are calculated considering IPCC's oxidation factor of diesel as 0.99 tCO₂/TJ.

Emissions due to usage of coal are calculated as per the formula given below:

Emissions due to coal = (Coal used in Mt X (Carbon content in % / 100)) x 44/12

Yearly Summary

Sl. No	Particular	Year 1	Year 2	Year 3	Year 4
1	CEF, kgCO ₂ /kWh	0.830	0.830	0.830	0.830
2	Power export to the grid, Million Units (MU)	4.11	43.77	39.49	43.176
3	Emission Reductions, tons of CO ₂	3411	35373	30576	34403
	Grand Total	103,763			

Measures to Ensure the Results / Uncertainty Analysis

As per the Power Purchase Agreement (PPA), the energy exported to the AP Grid is recorded from two independent meters viz., Main Meter and Check Meter and reading of main meter is used for billing. In the event of main meter not in operation / fails, the reading of the check meter shall be used for Billing.

The calibration of monitoring equipment is being maintained as per the requirement of APTRANSCO and the same is being done regularly. Power Generation, Export & Auxiliary Consumption, fuel consumption are being recorded daily and the same is being verified by General Manager (O&M) and it will be approved by Plant Manager (IGPPL).

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) D. Chakravarthi, Plant Manager.
- b) T. Kesavulu, General Manager (O&M).
- c) V.S. Prasada Rao, Sr.Manager (A/cs).
- d) J. Bhavani Shankar, Electrical Engineer.
- e) H. Ravi Kumar, Accounts Officer.
- f) Venkatesh .K, Officer.
- g) Bhoom Reddy, Lab Incharge (O&M).