

MONITORING REPORT

11.3 MW Renewable Energy project for a grid system by K.M.Power (P) Ltd, A.P, INDIA

UNFCCC Reference No. 0750

(Monitoring period is from February 06, 2002 to March 24, 2006 – both days included)

Ver 02, April 2007

Project Locations

- Unit-I. 4.0 MW Hydro Electric Project at Guntakandala Village,
District Kurnool, A.P, India.
- Unit-II. 3.3 MW Hydro Electric Project at Velpanuru Village,
District Kurnool, A.P, India.
- Unit-III. 4.0 MW Hydro Electric Project at Madhavaram Village
District Kurnool, A.P, India.

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1. Current Status of the Project

K.M. Power (P) Ltd (KMPL) has established 11.3 MW Small Hydro Projects bundled of 4 MW at Guntakandala Village, 3.3 MW at Velpanuru and 4MW at Madhavaram villages of Velugonda Mandal, Kurnool District, Andhra Pradesh.

The project activity is generation of electricity utilizing the drop in the bed levels of the Nippulavagu, which is a carrier canal for Kurnool – Cuddapah Canal and the discharges for the ayacut requirements and export of power to APTRANSCO grid.

2. 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)

The Guntakandala small hydro project commissioned in February 2002, the Velpanuru small hydro project commissioned in November 2002 and Madhavaram small hydro project commissioned in October 2003 and all projects are in continuous operation.

The details of major equipment of the project and suppliers are presented below:

Table 1 – Details of major equipment of the project and Suppliers

S.No	Location of plant	Equipment details	Supplier
1	Guntakandala small hydro plant	2x2000 KW Vertical Kaplan Turbine, Adjustable runner & indicating and recording instruments guide vanes, etc Synchronous generator of 3 Phase, 6.6 kV, k 15%, 50 c/s, 750 RPM, 0.8 PF and rated output 2000 KW	M/s Boving Fouress Ltd M/s Boving Fouress Ltd, Bangalore

S.No	Location of plant	Equipment details	Supplier
2	Velpanuru small hydro plant	2x1650 KW Vertical Kaplan Turbine, Adjustable runner & indicating and recording instruments guide vanes, etc Synchronous generator of 3 Phase, 6.6 kV, k 15%, 50 c/s, 750 RPM, 0.8 PF and rated output 2000 KW	M/s Boving Fouress Ltd M/s Boving Fouress Ltd, Bangalore
3	Madhavaram small hydro plant	2x2000 KW Vertical Kaplan Turbine, Adjustable runner & indicating and recording instruments guide vanes, etc Synchronous generator of 3 Phase, 6.6 kV, k 15%, 50 c/s, 750 RPM, 0.8 PF and rated output 2000 KW	M/s Boving Fouress Ltd M/s Boving Fouress Ltd, Bangalore

Since, projects started its operations all the projects were running normally. The year wise details of forced shut down periods, planned shut down periods and reasons for shut down is detailed below.

Table 2 Details of Major Shutdown days (Forced) - Guntakandala Small Hydro Plant

S.No	Year	Unit	Period	No. of Days	Reason for shut down
1	2001 -02	--	----	----	----
2	2002-03	--	----	----	----
3	2003-04	-	----	----	----
4	2004-05	Unit 1	06.10.2004 to 08.10.2004	3 days	Gear box bearing problem and Replacement
5	2005-06	Unit 1	10.08.2005	0.3 days	due to flood water
		Unit 2	10.08.2005	0.3 days	due to flood water

Table 3 Planned Shut down period - Guntakandala Small Hydro Plant

S.No	Year	Starting Date	No. of days	Reasons
1	2001 -02	15.03.2002 to 31.03.2002	16	Due to Non availability of water
2	2002-03	01.04.2002 to 12.10.2002 & 08.01.2003 to 31.03.2003	279	Due to Non availability of water
3	2003-04	01.04.2003 to 21.09.2003 & 11.01.2004 to 31.03.2004	254	Due to Non availability of water
4	2004-05	01.04.2004 to 09.08.2004 & 21.02.2005 to 31.03.2005	200	Due to Non availability of water
5	2005-06	01.04.2005 to 21.07.2005	109	Due to Non availability of water

Table 4: Planned and Forced shut downs - Guntakandala Small Hydro Plant

Details	Unit 1	Unit 2	Unit 1	Unit 2	Unit 1	Unit 2
Year	2001 -02	2001-02	2002-03	2002-03	2003 -04	2003-04
Total no. of working days	53	53	365	365	365	365
Planned shut downs days	16	16	279	279	254	254
Forced shut downs days	Nil	Nil	Nil	Nil	Nil	Nil
Total shut down days	16	16	279	279	254	254
Total no. of available days	37	37	86	86	111	111

Table 4: Planned and Forced shut downs - Guntakandala Small Hydro Plant

Details	Unit 1	Unit 2	Unit 1	Unit 2
Year	2004 -05	2004-05	2005-06	2005-06
Total no. of working days	365	365	365	365
Planned shut downs	200	200	109	109
Forced shut downs	3	Nil	0.3	0.3
Total shut down days	203	200	109.3	109.3
Total no. of available days	165	165	256	256

Table 5 Details of Major Shutdown days (Forced) - Velapanur Small Hydro Plant

S.No	Year	Unit	Period	No. of Days	Reason for shut down
1	2002-03	Unit 1	29.10.2002 to 02.11.2002	4	Vibration and heavy sound
		Unit 1	07.01.2003 to 13.01.2003	7	Turbine Bearings problem
		Unit 2	23.10.2002 to 25.10.2002	3	Vibration and heavy sound
		Unit 2	26.12.2002 to 07.01.2003	12	DE bearings problem
2	2003-04	Unit 2	17.12.2003 to 30.12.2003	14	DE bearings problem
3	2004-05	Unit 1	05.10.2004 to 10.10.2004	6	Due to flood water and men fell in water
		Unit 2	05.10.2004 to 10.10.2004	6	Due to flood water and men fell in water
		Unit 2	15.11.2004 to 15.12.2004	30	Generator bearing problem
4	2005-06	Unit 1	30.08.2005 to 31.08.2005	2	Bus CT failure
		Unit 2	30.08.2005 to 31.08.2005	2	Bus CT failure

Table 6 Planned Shut down Time - Velapanur Small Hydro Plant

S.No	Year	Starting Date	No.of Days	Forced ¹ Shut Downs (hours)
1	2002-03	14.01.2003 to 31.03.2004	18	Due to Non availability of water
2	2003-04	01.04.2003 to 22.09.2003	165	Due to Non availability of water
3	2004-05	11.04.2004 to 9.08.2004 22.02.2005 to 31.03.2005	179	Due to Non availability of water
4	2005-06	01.04.2005 to 22.07.2005	110	Due to Non availability of water

Table 7: Planned and Forced shut downs - Velapanuru Small Hydro Plant

Details	Unit 1	Unit 2	Unit 1	Unit 2	Unit 1	Unit 2	Unit 1 & 2
Year	2002-03	2002-03	2003 - 04	2003-04	2004-05	2004-05	2005-06
Total no. of working days	102	102	365	365	365	365	365
Planned shut downs days	18	18	165	165	179	179	110
Forced shut downs days	11	15	Nil	14	6	36	2
Total shut down days	29	33	165	179	185	215	112
Total no. of available days	84	84	200	200	186	186	255

Table 8 Details of Major Shutdown days (Forced) - Madhavaram Small Hydro Plant

S.No	Year	Unit	Period	No. of Days	Reason for shut down
1	2003-04	Unit 2	12.11.2003 to 04.12.2003	22	Damage in transport
2	2004-05	Unit 1	10.01.2004 to 10.09.2004	29	Bearing problem and repair works
3		Unit 1	18.08.2004 to 18.09.2004	31	Bearing problem and repair works

S.No	Year	Unit	Period	No. of Days	Reason for shut down
4		Unit 1	04.10.2004 to 06.10.2004	3	Due to flood water
5		Unit 1	07.10.2004 to 08.10.2004	2	Line break down
6		Unit 2	04.10.2004 to 06.10.2004	3	Due to flood water
7		Unit 2	07.10.2004 to 08.10.2004	2	Line break down
8		Unit 2	12.10.2004	0.4 days	Line break down
9	2005-06	Unit 1	20.08.2005	0.1 days	Line break down
		Unit 2	20.08.2005	0.1 days	Line break down

Table 9 Planned Shut down Time - Madhavaram Small Hydro Plant

S.No	Year	Starting Date	No.of days	Forced Shut ¹ Downs (hours)
1	2003-04	09.01.2004 to 31.03.2004	82	Due to Non availability of water
2	2004-05	01.04.2004 to 09.08.2004 22.02.2005 to 31.03.2005	170	Due to Non availability of water
3	2005-06	01.04.2005 to 22.07.2005	109	Due to Non availability of water

Table 10 : Planned and Forced shut downs - Madhavaram Small Hydro Plant

Details	Unit 1	Unit 2	Unit 1	Unit 2	Unit 1	Unit 2
Year	2003 -04	2003-04	2004-05	2004-05	2005-06	2005-06
Total no. of working days	131	131	365	365	365	365
Planned shut downs days	82	82	170	170	109	109
Forced shut downs days	Nil	22	65	5.4	0.1	0.1
Total shut down days	82	104	235	175.4	109.1	109.1
Total no. of available days	49	49	195	195	256	256

3. Monitoring Period

The Monitoring period is chosen from February 06, 2002 to March 24, 2006 (both days included)

4. Sustainability – Economic and Social Well Being

The project activity has resulted in sustainable development in the region as follows:

- Alleviation of poverty by generating direct and indirect employment in the area. The three projects generated indirect employment during the construction of the project activity and also permanent employment during operation of the project.
- The power generation from the project activity stabilised the local grid and helped in providing uninterrupted power for farmers.
- The project activity contributed to the development of infrastructure like roads, buildings and communication systems in the rural area.
- The project activity reduced the migration of the rural populace to urban areas, as the project activity generated employment opportunities.
- The project activity helped in bringing down greenhouse gases concentration in the atmosphere reducing the impact of global warming and mitigating climate change.

5. Parameters being monitored according to monitoring plan

- Electronic energy meters were installed for the energy exported to the State grid and the energy imported from the State grid for each hydro plant. Monthly energy meter readings have recorded and jointly certified by the representatives of APTRANSCO & KMPL.
- Hourly data recording of the energy parameters and also the recording of total energy generated and auxiliary power consumption for every 8 hours shift.
- Daily readings were aggregated to monthly readings.
- Monthly reports stating the net energy exported were prepared by shift in charge and verified by plant managers.
- Calculated base line emission factor for Southern regional grid.

As per the billing data, the Monthwise data on electricity generation, auxiliary consumption, net electricity export for three projects is presented in the tables given below:

Table 11 – Month wise data on Gross electricity generation, Aux. Consumption and Export to Grid as per billing period (24th to 24th of every month) for Guntakandala Unit.

Ref.No.	Month	Year	Electricity Generation in KWh	Aux consumption in KWh	Electricity Export to Grid in KWh
1	February	2002	634253	4653	629600
2	March	2002	481070	3870	477200
	Total for FY 2001-02		1115323	8523	1106800
3	April	2002	0	0	0
4	May	2002	0	0	0
5	June	2002	0	0	0
6	July	2002	0	0	0
7	August	2002	0	0	0
8	September	2002	0	0	0
9	October	2002	265200	2400	262800
10	November	2002	727062	5262	721800
11	December	2002	964230	5130	959100
12	January	2003	559603	2303	557300
13	February	2003	0	0	0
14	March	2003	0	0	0
	Total for FY 2002-03		2516095	15095	2501000
15	April	2003	0	0	0
16	May	2003	0	0	0
17	June	2003	0	0	0
18	July	2003	0	0	0
19	August	2003	0	0	0
20	September	2003	2800	0	2800
21	October	2003	658253	4053	654200
22	November	2003	589273	3473	585800
23	December	2003	1210707	6207	1204500
24	January	2004	593363	2863	590500
25	February	2004	0	0	0
26	March	2004	0	0	0
	Total for FY 2003-04		3054396	16596	3037800

Ref.No.	Month	Year	Electricity Generation in KWh	Aux consumption in KWh	Electricity Export to Grid in KWh
27	April	2004	0	0	0
28	May	2004	0	0	0
29	June	2004	0	0	0
30	July	2004	0	0	0
31	August	2004	646812	3112	643700
32	September	2004	2712893	9693	2703200
33	October	2004	2341160	11460	2329700
34	November	2004	2868209	12409	2855800
35	December	2004	2075461	8761	2066700
36	January	2005	887469	5669	881800
37	February	2005	378012	3512	374500
38	March	2005	0	0	0
Total for FY 2004-05			11910016	54616	11855400
39	April	2005	0	0	0
40	May	2005	0	0	0
41	June	2005	0	0	0
42	July	2005	2900	0	2900
43	August	2005	1937711	9511	1928200
44	September	2005	2887238	11038	2876200
45	October	2005	2839589	9589	2830000
46	November	2005	2907840	8840	2899000
47	December	2005	2541251	8051	2533200
48	January	2006	1840335	7235	1833100
49	February	2006	1383471	6671	1376800
50	March	2006	1005280	6480	998800
Total for FY 2005-06			17345615	67415	17278200

Table 12 – Month wise data on Gross electricity generation, Aux. Consumption and Export to Grid as per billing period (24th to 24th of every month) for Velpanuru Unit.

Ref. No.	Month	Year	Electricity Generation in KWh	Aux. Consumption in KWh	Electricity Export to Grid in KWh
1	November	2002	328281	5481	322800
2	December	2002	727935	5935	722000
3	January	2003	179296	2296	177000
4	February	2003	0	0	0
5	March	2003	0	0	0
Total for FY 2002-03			1235512	13712	1221800
6	April	2003	0	0	0
7	May	2003	0	0	0
8	June	2003	0	0	0
9	July	2003	0	0	0
10	August	2003	0	0	0
11	September	2003	5800	0	5800
12	October	2003	519631	5331	514300
13	November	2003	459264	4964	454300
14	December	2003	857591	5691	851900
15	January	2004	459079	3079	456000
16	February	2004	0	0	0
17	March	2004	0	0	0
Total for FY 2003-04			2301365	19065	2282300
18	April	2004	0	0	0
19	May	2004	0	0	0
20	June	2004	0	0	0
21	July	2004	0	0	0
22	August	2004	433250	3650	429600
23	September	2004	1583225	10725	1572500
24	October	2004	1273600	9100	1264500
25	November	2004	1522800	9200	1513600
26	December	2004	881400	5700	875700
27	January	2005	691609	5609	686000
28	February	2005	300435	4235	296200
29	March	2005	0	0	0
Total for FY 2004-05			6686319	48219	6638100

Ref. No.	Month	Year	Electricity Generation in KWh	Aux. Consumption in KWh	Electricity Export to Grid in KWh
39	April	2005	0	0	0
40	May	2005	0	0	0
41	June	2005	0	0	0
42	July	2005	2700	0	2700
43	August	2005	1154768	9468	1145300
44	September	2005	1523788	11088	1512700
45	October	2005	1711099	10699	1700400
46	November	2005	1854477	9877	1844600
47	December	2005	1674330	8430	1665900
48	January	2006	1334853	6953	1327900
49	February	2006	1036689	6589	1030100
50	March	2006	747578	5678	741900
Total for FY 2005-06			11040282	68782	10971500

Table 12 – Month wise data on Gross electricity generation, Aux. Consumption and Export to Grid as per billing period (24th to 24th of every month) for Madhavaram Unit.

S. No.	Month	Year	Electricity Generation In KWh	Aux. Consumption in KWh	Electricity Export to Grid in KWh
1	December	2003	1044254	6654	1037600
2	January	2004	527236	2636	524600
3	February	2004	0	0	0
4	March	2004	0	0	0
Total for FY 2003-04			1571490	9290	1562200
5	April	2004	0	0	0
6	May	2004	0	0	0
7	June	2004	0	0	0
8	July	2004	0	0	0
9	August	2004	368631	2431	366200
10	September	2004	1145016	7116	1137900
11	October	2004	1352545	8445	1344100
12	November	2004	1692413	9913	1682500
13	December	2004	1394763	8463	1386300
14	January	2005	714136	5436	708700
15	February	2005	308729	3329	305400
16	March	2005	0	0	0
Total for FY 2004-05			6976233	45133	6931100
17	April	2005	0	0	0
18	May	2005	0	0	0
19	June	2005	0	0	0
20	July	2005	1700	0	1700
21	August	2005	1393019	7919	1385100
22	September	2005	1980541	10041	1970500
23	October	2005	2042539	9839	2032700
24	November	2005	2320482	8982	2311500
25	December	2005	2046850	7550	2039300
26	January	2006	1589593	6393	1583200
27	February	2006	1222664	5164	1217500
28	March	2006	903750	4850	898900
Total for FY 2005-06			13501138	60738	13440400

6. Formulae Used

The baseline of the project activity is kWh produced by the hydroelectric project multiplied by an emission co-efficient i.e., weighted average emissions in tCO₂ per GWh of the generation mix of respective years.

The emission reductions for a given year are baseline emissions minus the project emissions and leakage.

$$ER_y = BE_y - PE_y - L_y$$

Where ER_y is emission reductions in a given year

Where BE_y is baseline emissions in a given year

Where PE_y is project emissions in a given year

Where L_y is leakage in a given year

Since the project emissions (PE_y) as well as the leakage (L_y) are zero, the emission reductions are equal to baseline emissions. These are calculated based on the monitored net amount of electricity supplied to the grid and baseline emission factor.

$$ER_y = BE_y = EF_y \times EG_y$$

Where EF_y is the emission factor for a given year EG_y is the electricity generation in a given year. Using above formulae, the Emissions reductions from the project activity for is presented below:

The emission factor for the year 2001-02 was not indicated in the PDD. We have considered emission factor as 742.52 tCO₂/GWh which is published by CEA for the year 2001-02.

7. Emission Reductions

The emission reductions per year during 2001-02, 2002-03, 2003-04, 2004-05 and 2005-06 are as given below:

Unit-I: Guntakandala

S.No.	Month	Year	Electricity Export to Grid	Electricity Imported from Grid	Total Electricity Displaced by Project Activity		Emission Factor	Baseline Emissions	Project Emissions	Net Emission Reductions
			(KWh)	(KWh)	(KWh)	(GWh)	tCO2/GWh	tCO2	tCO2	tCO2
1	From 6th Feb	2002	629600	1900	627700	0.628	742.52	466.1	0.0	466.1
2	March	2002	477200	4000	473200	0.473	742.52	351.4	0.0	351.4
Total for FY 2001-02			1106800	5900	1100900	1.101		817.4	0.0	817.4
3	April	2002	0	5500	-5500	-0.006	819.04	-4.5	0.0	-4.5
4	May	2002	0	4700	-4700	-0.005	819.04	-3.8	0.0	-3.8
5	June	2002	0	7100	-7100	-0.007	819.04	-5.8	0.0	-5.8
6	July	2002	0	7000	-7000	-0.007	819.04	-5.7	0.0	-5.7
7	August	2002	0	6100	-6100	-0.006	819.04	-5.0	0.0	-5.0
8	September	2002	0	4100	-4100	-0.004	819.04	-3.4	0.0	-3.4
9	October	2002	262800	900	261900	0.262	819.04	214.5	0.0	214.5
10	November	2002	721800	800	721000	0.721	819.04	590.5	0.0	590.5
11	December	2002	959100	400	958700	0.959	819.04	785.2	0.0	785.2
12	January	2003	557300	200	557100	0.557	819.04	456.3	0.0	456.3
13	February	2003	0	100	-100	0.000	819.04	-0.1	0.0	-0.1
14	March	2003	0	100	-100	0.000	819.04	-0.1	0.0	-0.1
Total for FY 2002-03			2501000	37000	2464000	2.464		2018.1	0.0	2018.1

15	April	2003	0	0	0	0.000	841.16	0.0	0.0	0.0
16	May	2003	0	100	-100	0.000	841.16	-0.1	0.0	-0.1
17	June	2003	0	100	-100	0.000	841.16	-0.1	0.0	-0.1
18	July	2003	0	400	-400	0.000	841.16	-0.3	0.0	-0.3
19	August	2003	0	600	-600	-0.001	841.16	-0.5	0.0	-0.5
20	September	2003	2800	600	2200	0.002	841.16	1.9	0.0	1.9
21	October	2003	654200	600	653600	0.654	841.16	549.8	0.0	549.8
22	November	2003	585800	800	585000	0.585	841.16	492.1	0.0	492.1
23	December	2003	1204500	400	1204100	1.204	841.16	1012.8	0.0	1012.8
24	January	2004	590500	200	590300	0.590	841.16	496.5	0.0	496.5
25	February	2004	0	100	-100	0.000	841.16	-0.1	0.0	-0.1
26	March	2004	0	0	0	0.000	841.16	0.0	0.0	0.0
Total for FY 2003-04			3037800	3900	3033900	3.034		2552.0	0.0	2552.0
27	April	2004	0	0	0	0.000	795.04	0.0	0.0	0.0
28	May	2004	0	100	-100	0.000	795.04	-0.1	0.0	-0.1
29	June	2004	0	200	-200	0.000	795.04	-0.2	0.0	-0.2
30	July	2004	0	500	-500	-0.001	795.04	-0.4	0.0	-0.4
31	August	2004	643700	800	642900	0.643	795.04	511.1	0.0	511.1
32	September	2004	2703200	100	2703100	2.703	795.04	2149.1	0.0	2149.1
33	October	2004	2329700	300	2329400	2.329	795.04	1852.0	0.0	1852.0
34	November	2004	2855800	100	2855700	2.856	795.04	2270.4	0.0	2270.4
35	December	2004	2066700	200	2066500	2.067	795.04	1643.0	0.0	1643.0
36	January	2005	881800	100	881700	0.882	795.04	701.0	0.0	701.0
37	February	2005	374500	700	373800	0.374	795.04	297.2	0.0	297.2
38	March	2005	0	100	-100	0.000	795.04	-0.1	0.0	-0.1
Total for FY 2004-05			11855400	3200	11852200	11.852		9423.0	0.0	9423.0

39	April	2005	0	100	-100	0.000	739.14	-0.1	0.0	-0.1
40	May	2005	0	0	0	0.000	739.14	0.0	0.0	0.0
41	June	2005	0	300	-300	0.000	739.14	-0.2	0.0	-0.2
42	July	2005	2900	1400	1500	0.002	739.14	1.1	0.0	1.1
43	August	2005	1928200	300	1927900	1.928	739.14	1425.0	0.0	1425.0
44	September	2005	2876200	100	2876100	2.876	739.14	2125.8	0.0	2125.8
45	October	2005	2830000	200	2829800	2.830	739.14	2091.6	0.0	2091.6
46	November	2005	2899000	0	2899000	2.899	739.14	2142.8	0.0	2142.8
47	December	2005	2533200	100	2533100	2.533	739.14	1872.3	0.0	1872.3
48	January	2006	1833100	0	1833100	1.833	739.14	1354.9	0.0	1354.9
49	February	2006	1376800	100	1376700	1.377	739.14	1017.6	0.0	1017.6
50	March	2006	998800	300	998500	0.999	739.14	738.0	0.0	738.0
Total for FY 2005-06			17278200	2900	17275300	17.275		12768.9	0.0	12768.9
Total			35779200	52900	35726300	35.726		27579.4	0.0	27579.4

Unit-II: Velpalur

S.No.	Month	Year	Export to Grid	Electricity Imported	Total Electricity Displaced		Emission Factor	Baseline Emissions	Project Emissions	Net Emission Reductions
			(KWh)	(KWh)	(KWh)	(GWh)	tCO2/GWh	tCO2	tCO2	tCO2
1	November	2002	322800	100	322700	0.323	819.04	264.3	0.0	264.3
2	December	2002	722000	500	721500	0.722	819.04	590.9	0.0	590.9
3	January	2003	177000	1900	175100	0.175	819.04	143.4	0.0	143.4
4	February	2003	0	1600	-1600	-0.002	819.04	-1.3	0.0	-1.3
5	March	2003	0	1600	-1600	-0.002	819.04	-1.3	0.0	-1.3
	Total for FY 2002-03		1221800	5700	1216100	1.216		996.0	0.0	996.0
6	April	2003	0	1700	-1700	-0.002	841.16	-1.4	0.0	-1.4
7	May	2003	0	1100	-1100	-0.001	841.16	-0.9	0.0	-0.9
8	June	2003	0	900	-900	-0.001	841.16	-0.8	0.0	-0.8
9	July	2003	0	1600	-1600	-0.002	841.16	-1.3	0.0	-1.3
10	August	2003	0	1800	-1800	-0.002	841.16	-1.5	0.0	-1.5
11	September	2003	5800	2300	3500	0.004	841.16	2.9	0.0	2.9
12	October	2003	514300	1000	513300	0.513	841.16	431.8	0.0	431.8
13	November	2003	454300	900	453400	0.453	841.16	381.4	0.0	381.4
14	December	2003	851900	200	851700	0.852	841.16	716.4	0.0	716.4
15	January	2004	456000	700	455300	0.455	841.16	383.0	0.0	383.0
16	February	2004	0	900	-900	-0.001	841.16	-0.8	0.0	-0.8
17	March	2004	0	600	-600	-0.001	841.16	-0.5	0.0	-0.5
	Total for FY 2003-04		2282300	13700	2268600	2.269	10093.92	1908.3	0.0	1908.3

18	April	2004	0	600	-600	-0.001	795.04	-0.5	0.0	-0.5
19	May	2004	0	600	-600	-0.001	795.04	-0.5	0.0	-0.5
20	June	2004	0	700	-700	-0.001	795.04	-0.6	0.0	-0.6
21	July	2004	0	900	-900	-0.001	795.04	-0.7	0.0	-0.7
22	August	2004	429600	900	428700	0.429	795.04	340.8	0.0	340.8
23	September	2004	1572500	100	1572400	1.572	795.04	1250.1	0.0	1250.1
24	October	2004	1264500	500	1264000	1.264	795.04	1004.9	0.0	1004.9
25	November	2004	1513600	0	1513600	1.514	795.04	1203.4	0.0	1203.4
26	December	2004	875700	300	875400	0.875	795.04	696.0	0.0	696.0
27	January	2005	686000	0	686000	0.686	795.04	545.4	0.0	545.4
28	February	2005	296200	1000	295200	0.295	795.04	234.7	0.0	234.7
29	March	2005	0	1000	-1000	-0.001	795.04	-0.8	0.0	-0.8
	Total for FY 2004-05		6638100	6600	6631500	6.632		5272.3	0.0	5272.3
30	April	2005	0	1000	-1000	-0.001	739.14	-0.7	0.0	-0.7
31	May	2005	0	900	-900	-0.001	739.14	-0.7	0.0	-0.7
32	June	2005	0	1200	-1200	-0.001	739.14	-0.9	0.0	-0.9
33	July	2005	2700	1300	1400	0.001	739.14	1.0	0.0	1.0
34	August	2005	1145300	400	1144900	1.145	739.14	846.2	0.0	846.2
35	September	2005	1512700	900	1511800	1.512	739.14	1117.4	0.0	1117.4
36	October	2005	1700400	100	1700300	1.700	739.14	1256.8	0.0	1256.8
37	November	2005	1844600	100	1844500	1.845	739.14	1363.3	0.0	1363.3
38	December	2005	1665900	0	1665900	1.666	739.14	1231.3	0.0	1231.3
39	January	2006	1327900	100	1327800	1.328	739.14	981.4	0.0	981.4
40	February	2006	1030100	0	1030100	1.030	739.14	761.4	0.0	761.4
41	March	2006	741900	300	741600	0.742	739.14	548.1	0.0	548.1
	Total for FY 2005-06		10971500	6300	10965200	10.965	8869.68	8104.8	0.0	8104.8

	Total	21113700	32300	21081400	21.081		16281.4	0.0	16281.4

Unit-III: Madhavaram

S.No.	Month	Year	Export to Grid	Electricity Imported	Total Electricity Displaced		Emission Factor	Baseline Emissions	Project Emissions	Net Emission Reductions
			(KWh)	(KWh)	(KWh)	(GWh)	tCO2/GWh	tCO2	tCO2	tCO2
1	December	2003	1037600	700	1036900	1.037	841.16	872.2	0.0	872.2
2	January	2004	524600	800	523800	0.524	841.16	440.6	0.0	440.6
3	February	2004	0	1200	-1200	-0.001	841.16	-1.0	0.0	-1.0
4	March	2004	0	1000	-1000	-0.001	841.16	-0.8	0.0	-0.8
	Total for FY 2003-04		1562200	3700	1558500	1.559		1310.9	0.0	1310.9
5	April	2004	0	1000	-1000	-0.001	795.04	-0.8	0.0	-0.8
6	May	2004	0	1200	-1200	-0.001	795.04	-1.0	0.0	-1.0
7	June	2004	0	1300	-1300	-0.001	795.04	-1.0	0.0	-1.0
8	July	2004	0	1400	-1400	-0.001	795.04	-1.1	0.0	-1.1
9	August	2004	366200	1200	365000	0.365	795.04	290.2	0.0	290.2
10	September	2004	1137900	200	1137700	1.138	795.04	904.5	0.0	904.5
11	October	2004	1344100	500	1343600	1.344	795.04	1068.2	0.0	1068.2
12	November	2004	1682500	100	1682400	1.682	795.04	1337.6	0.0	1337.6
13	December	2004	1386300	600	1385700	1.386	795.04	1101.7	0.0	1101.7
14	January	2005	708700	200	708500	0.709	795.04	563.3	0.0	563.3
15	February	2005	305400	1200	304200	0.304	795.04	241.9	0.0	241.9
16	March	2005	0	1200	-1200	-0.001	795.04	-1.0	0.0	-1.0
	Total for FY 2004-05		6931100	10100	6921000	6.921		5502.5	0.0	5502.5

17	April	2005	0	1200	-1200	-0.001	739.14	-0.9	0.0	-0.9
18	May	2005	0	1300	-1300	-0.001	739.14	-1.0	0.0	-1.0
19	June	2005	0	3200	-3200	-0.003	739.14	-2.4	0.0	-2.4
20	July	2005	1700	1600	100	0.000	739.14	0.1	0.0	0.1
21	August	2005	1385100	600	1384500	1.385	739.14	1023.3	0.0	1023.3
22	September	2005	1970500	200	1970300	1.970	739.14	1456.3	0.0	1456.3
23	October	2005	2032700	100	2032600	2.033	739.14	1502.4	0.0	1502.4
24	November	2005	2311500	100	2311400	2.311	739.14	1708.4	0.0	1708.4
25	December	2005	2039300	0	2039300	2.039	739.14	1507.3	0.0	1507.3
26	January	2006	1583200	100	1583100	1.583	739.14	1170.1	0.0	1170.1
27	February	2006	1217500	0	1217500	1.218	739.14	899.9	0.0	899.9
28	March	2006	898900	400	898500	0.899	739.14	664.1	0.0	664.1
Total for FY 2005-06			13440400	8800	13431600	13.432		9927.8	0.0	9927.8
T o t a l			21933700	22600	21911100	21.911		16741.3	0.0	16741.3

Summary of Net Emission Reductions (in Tons of CO2)

S.No.	Year	UNIT - I	UNIT - II	UNIT - III	Total
		Guntakandala	Velpanuru	Madhavaram	
1	6th Feb 2002 to March 02	817	0	0	817
2	2002 - 03	2018	996	0	3014
3	2003 - 04	2552	1908	1311	5771
4	2004 - 05	9423	5272	5502	20198
5	2005 - 06	12769	8105	9928	30802
Grand Total		27579	16281	16741	60602

The details of calculation of emission reductions month wise is presented as Annexure (Excel Sheet)

8. Measures to ensure the results/uncertainty analysis

The energy exported by each projects of K.M. Power (P) Ltd. is recorded from independent main meter installed at the switch yard area of the respective project. In the event, the main meter is not in operation, and the reading from check meter is used for billing.

The calibration of monitoring equipment is being maintained as per the requirement of Electricity Board and the same is being done regularly. Power generation, export and energy import are being recorded daily and the same is being verified by the respective plant incharge.

9. Details of Monitoring team and Responsibilities

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

Table 15 - Monitoring Team

Project	Shift Incharge	Plant Incharge	Executive Director	Managing Director
Guntakandala	Mr.Prabhakar Reddy	Mr.Madan Mohan	Mr.Y Thimmaya	Mr.G Ramanarayan Reddy
Velpanuru	Mr.Dhanunjaya	Mr.Madan Mohan	Mr.Y Thimmaya	Mr.G Ramanarayan Reddy
Madhavaram	Mr.Madan Mohan	Mr.Madan Mohan	Mr.Y Thimmaya	Mr.G Ramanarayan Reddy

10. Roles and Responsibilities – Monitoring Plan

Executive Director

Executive Director is responsible for the total monitoring plan. The executive director will examine the reports generated by plant Incharges w.r.t, the monthly electricity generated, exported and annual emission reduction calculations as per the monitoring plan. He also examines the internal audit reports prepared by internal auditor/plant Incharges and will in particular take note of any deviations in data over the norms and monitor that the corrective actions have resulted in adherence to standards

Plant Incharge

Plant Incharge is assisting to executive director for completing the task discussed above. The plant managers are responsible for the electricity generations at their individual locations. They will cross check and sign the log book regularly and report to executive director for any abnormality. The calibration of the meters installed will be taken care by him as per the monitoring plan.

The responsibility of storage and archiving of information in good condition also lies with the plant Incharge. He also generate internal audit reports as per the monitoring plan and when ever necessary, and will be submitted to Executive Director.

Shift in Charge

Shift Incharge is responsible for recording the electricity meter readings in the electricity board meter and check meter on daily basis. He will also responsible to take note of auxiliary consumption, power import, plant shut down times, etc. The monthly reports will be generated and submitted to plant Incharge for verification and emission reduction calculations.