IRR calculations for Gas Turbine Project in Apollo Tyres							
Project parameters							
Initial Investment of the proposed project (2 x 4.2 MW)	275.00						
Expected CER pricing (Rs/ ton of Co2)	308.00						
Production loss during project implementation (Rs in million)							
Year	2004	2005	2006	2007	2008	2009	2010
Expenditure							
Initial investment (equity)	275.00						
Recurring cost							
Cost of insurance (1.5% of project cost) every year		4.13	4.13	4.13	4.13	4.13	4.13
Income Tax on Energy Savings		38.76	43.55	48.70	54.23	60.16	63.43
Total cashflow out (A)	275.00	42.88	47.68	52.83	58.35	64.28	67.56
Income							
Salvage Value of project (10%)		0	0	0	0	0	0
Saving in income tax due to depreciation (33.66% of depreciated amount)		8.33	8.33	8.33	8.33	8.33	8.33
Savings in operating cost based on following figures. F.O Price of Rs. 11.144/kg with 6.4% Escalation, Grid power at price of Rs. 5.3/kWh with 10.1% escalation N.G. Price of Rs. 8.2/SM3 with constant price for first 5 years and 10% Escalation for next 5 years Maintenance cost escalation 5%	0	115.14	129.39	144.68	161.10	178.72	188.45
CER credits		14.43	14.43	14.43	14.43	14.43	14.43
Total project income without considering CER credits(B)	0	123.47	137.72	153.01	169.43	187.05	196.78
Total project income with considering CER credits(C)	0	137.90	152.15	167.45	183.86	201.48	211.21
Net cash flow without considering CER Credits (A-B)	-275.00	80.59	90.04	100.19	111.08	122.77	129.22
Net cash flow with considering CER Credits (A-C)	-275.00	95.02	104.48	114.62	125.51	137.20	143.66
IRR of the project without considering CER credits	37.74%						
IRR of the project with considering CER credits	42.19%						

2011	2012	2013	2014	2015	2016	2017	2018	2019
4.13	4.13	4.13	4.13	4.13	4.13	4.13	4.13	4.13
67.59	70.48	74.25	78.21	82.36	86.69	91.21	95.94	100.86
71.71	74.60	78.38	82.34	86.48	90.81	95.34	100.06	104.99
0	0	0	0	0	0	0	0	27.5
8.33	8.33	8.33	8.33	8.33	8.33	8.33	8.33	8.33
200.80	209.37	220.60	232.36	244.67	257.54	270.99	285.02	299.66
14.43	14.43	14.43	14.43					
209.13	217.71	228.93	240.69	253.00	265.87	279.32	293.35	335.49
223.56	232.14	243.37	255.13	253.00	265.87	279.32	293.35	335.49
137.42	143.10	150.55	158.35	166.52	175.06	183.98	193.29	230.50
151.85	157.54	164.99	172.79	166.52	175.06	183.98	193.29	230.50

S.No	Particulars	Units	DG Based on FO
A	**Power Data**		**2x4.2 MW**
1	Gross Power Generated for DG ISO (2 x 4.2) STG (1 x 10) GTG (1 X 10 MW)	KW	8400.00
3	Plant loading	%	90%
4	Generation at Site	KW	7560.00
5	Auxilliary Consumption	KW	378
6	Net Power Generated	KW	7182.00
7	Operating hours per annum	Hours	8400
8	Units exported per annum	KWh	60328800.00
9	total electricity requirement	kwh/hour	9375
10	electricity imported to grid	kwh/hour	2193.00
B	**Steam Data**		
1	Steam generation from system	TPH	3.50
2	Steam generation from system	Tons/Annum	29400.00
3	Deficit Steam quantity	TPH	25.50
4	Additional Boiler required		Yes
5	Capacity of Additional boiler	TPH	30.00
C	**Fuel Data**		
1	**Fuel for the plant**		**Furnace Oil**
2	Fuel Required annually		
3	*Fuel for Power*	TPH or M3/Hr	1.89
4	*Fuel for steam*	TPH or M3/Hr	1.76
D	**Lube Oil Data**		
1	Lube Oil required per day	Kgs/ Day	172.37
3	Cost of Lube oil per Annum	Rs./Annum	3770550.00
H	**Estimated Project Cost(Not Plant and Machinery cost)**	Rs.	**280000000**
I	**Cost of Power**		
1	Fuel Cost for Power	Rs/kWh	2.93
2	Grid Power	Rs/kWh	1.62
4	Lube Oil Cost	Rs/kWh	0.063
5	O&M Cost (3% of capital cost)	Rs/kWh	0.14
9	Cost of Limestone	Rs/kWh	0.00
10	Cost of water	Rs/kWh	0.01
11	Cost of Ash Handling	Rs/kWh	0.00
	Total cost without grid power cost, fuel cost and O&M cost	Rs/kWh	0.07
	Total cost	Rs/kWh	4.76
	Cost after steam credit	Rs/kWh	**4.36**

STG on Petcoke+ Imp Coal	STG on Indian Coal	GTG BASED ON GAS
1 x 10 MW	1 x 10 MW	2 X 4.2 MW
10000	10000	8400.00
95%	95%	95%
9500.00	9500.00	7980.00
1250.0	1250.0	200.0
8250.00	8250.00	7780.00
8400	8400	8400
69300000.00	69300000.00	65352000.00
9375	9375	9375
1125.00	1125.00	1595.00
29.00	29.00	20.00
243600.00	243600.00	168000.00
0	0	9.00
No	No	Yes
0	0	10.00
Petcoke+Imp Coal	**Indian Coal**	**Gas**
3.99	5.42	2872.80
0.00	0.00	692.31
10	10	2
239166.00	239166.00	49000.00
380000000	**370000000**	**275000000**
1.45	1.77	3.03
0.72	0.72	1.09
0.003	0.003	0.001
0.16	0.16	0.13
0.14	0.14	0.00
0.03	0.03	0.00
0.02	0.04	0.00
0.19	0.21	0.00
2.53	2.87	4.24
1.02	**1.47**	**2.62**

FO prices for escalation calculation (www.energymanagertraining.com)

2000-01	11.5			
2001-02	10.5	-8.70		
2002-03	12.75	21.43	**6.4**	**%**

Escalation on Coal/petcoke prices

www.cmaindia.org **6.6 %**

Escalation on power prices

www.cmaindia.org **10.1 %**

Item : FURNACE OIL. RATE PER/LTR 2002-03

				RATE INCL.	
Month	Sir Date	RATE	FREIGHT	FREIGHT	
April		8.684	0.755	9.439	
May		9.559	0.755	10.314	
June		9.929	0.755	10.684	
July		9.738	0.755	10.493	
Aug		9.909	0.755	10.664	
Sept		10.312	0.755	11.067	
Oct		10.394	0.755	11.149	
Nov		9.406	0.755	10.161	
Dec		9.315	0.755	10.070	
Jan		9.886	0.755	10.641	
Feb		11.017	0.755	11.772	
				10.587	Rs/lt
				11.144	Rs/kg

IRR calculations for Coal Fired Power Project in Apollo Tyres							
Project parameters							
Initial Investment of the proposed project (1 x 10 MW) (Rs in millions)	370.00						
Production loss during project implementation (Rs in million)							
Year	2004	2005	2006	2007	2008	2009	2010
Expenditure (Rs. In Millions)							
Initial investment (equity)	370.00						
Recurring cost							
Cost of insurance (1.5% of project cost) every year		5.55	5.55	5.55	5.55	5.55	5.55
Income Tax on Energy Savings		67.96	73.29	85.33	85.23	91.91	99.13
Total cashflow out (A)	370.00	73.51	78.84	90.88	90.78	97.46	104.68
Income (Rs. In Millions)							
Salvage Value of project (10%)		0	0	0	0	0	0
Saving in income tax due to depreciation (33.66% of depreciated amount)		11.21	11.21	11.21	11.21	11.21	11.21
Savings in operating cost based on following figures. F.O Price of Rs. 11.144/kg with 6.4% Escalation.Grid power at price of Rs. 5.3/kWh with 10.1% escalation Indian Coal Price of Rs. 2700/Ton with 6.6% Escalation Maintenance cost escalation 5% every	0	201.91	217.73	253.50	253.20	273.07	294.51
Total project income (B)	0	213.12	228.94	264.71	264.41	284.27	305.71
Net cash flow (A-B)	-370.00	139.61	150.10	173.83	173.63	186.81	201.03
IRR of the project	45.32%						

2011	2012	2013	2014	2015	2016	2017	2018	2019
5.55	5.55	5.55	5.55	5.55	5.55	5.55	5.55	5.55
106.92	115.34	124.43	134.26	144.88	156.37	168.79	182.24	196.78
112.47	120.89	129.98	139.81	150.43	161.92	174.34	187.79	202.33
0	0	0	0	0	0	0	0	37
11.21	11.21	11.21	11.21	11.21	11.21	11.21	11.21	11.21
317.66	342.66	369.67	398.87	430.43	464.55	501.46	541.40	584.62
328.87	353.87	380.88	410.08	441.64	475.76	512.67	552.61	632.83
216.39	232.98	250.90	270.27	291.20	313.84	338.33	364.82	430.50

S.No	Particulars	Units	DG Based on FO
A	**Power Data**		**2x4.2 MW**
1	Gross Power Generated for DG ISO (2 x 4.2) STG (1 x 10) GTG (1 X 10 MW)	KW	8400.00
3	Plant loading	%	90%
4	Generation at Site	KW	7560.00
5	Auxilliary Consumption	KW	378
6	Net Power Generated	KW	7182.00
7	Operating hours per annum	Hours	8400
8	Units exported per annum	KWh	60328800.00
9	total electricity requirement	kwh/hour	9375
10	electricity imported to grid	kwh/hour	2193.00
B	**Steam Data**		
1	Steam generation from system	TPH	3.50
2	Steam generation from system	Tons/Annum	29400.00
3	Deficit Steam quantity	TPH	25.50
4	Additional Boiler required		Yes
5	Capacity of Additional boiler	TPH	30.00
C	**Fuel Data**		
1	**Fuel for the plant**		**Furnace Oil**
2	Fuel Required annually		
3	*Fuel for Power*	TPH or M3/Hr	1.89
4	*Fuel for steam*	TPH or M3/Hr	1.76
D	**Lube Oil Data**		
1	Lube Oil required per day	Kgs/ Day	172.37
3	Cost of Lube oil per Annum	Rs./Annum	3770550.00
H	**Estimated Project Cost(Not Plant and Machinery cost)**	Rs.	**280000000**
I	**Cost of Power**		
1	Fuel Cost for Power	Rs/kWh	2.93
2	Grid Power	Rs/kWh	1.62
4	Lube Oil Cost	Rs/kWh	0.063
5	O&M Cost (3% of capital cost)	Rs/kWh	0.14
9	Cost of Limestone	Rs/kWh	0.00
10	Cost of water	Rs/kWh	0.01
11	Cost of Ash Handling	Rs/kWh	0.00
	Total cost without grid power cost, fuel cost and O&M cost	Rs/kWh	0.07
	Total cost	Rs/kWh	4.76
	Cost after steam credit	Rs/kWh	**4.36**

STG on Petcoke+ Imp Coal	STG on Indian Coal	GTG BASED ON GAS
1 x 10 MW	1 x 10 MW	2 X 4.2 MW
10000	10000	8400.00
95%	95%	95%
9500.00	9500.00	7980.00
1250.0	1250.0	200.0
8250.00	8250.00	7780.00
8400	8400	8400
69300000.00	69300000.00	65352000.00
9375	9375	9375
1125.00	1125.00	1595.00
29.00	29.00	20.00
243600.00	243600.00	168000.00
0	0	9.00
No	No	Yes
0	0	10.00
Petcoke+Imp Coal	**Indian Coal**	**Gas**
3.99	5.42	2872.80
0.00	0.00	692.31
10	10	2
239166.00	239166.00	49000.00
380000000	**370000000**	**275000000**
1.45	1.77	3.03
0.72	0.72	1.09
0.003	0.003	0.001
0.16	0.16	0.13
0.14	0.14	0.00
0.03	0.03	0.00
0.02	0.04	0.00
0.19	0.21	0.00
2.53	2.87	4.24
1.02	**1.47**	**2.62**

IRR calculations for Petcoke Fired Power Project in Apollo Tyres							
Project parameters							
Initial Investment of the proposed project (1 x 10 MW) (Rs in millions)	380.00						
Year	2004	2005	2006	2007	2008	2009	2010
Expenditure							
Initial investment (equity)	380.00						
Recurring cost							
Cost of insurance (1.5% of project cost) every year		5.70	5.70	5.70	5.70	5.70	5.70
Income Tax on Energy Savings		78.38	84.36	90.81	97.76	105.24	113.31
Total cashflow out (A)	380.00	84.08	90.06	96.51	103.46	110.94	119.01
Income							
Salvage Value of project (10%)		0	0	0	0	0	0
Saving in income tax due to depreciation (33.66% of depreciated amount)		11.51	11.51	11.51	11.51	11.51	11.51
Savings in operating cost based on following figures. F.O Price of Rs. 11.144/kg with 10% Escalation. Grid power at price of Rs. 5.3/kWh with 10% escalation Petcoke Price of Rs. 3000/Ton with 6% Escalation Maintenance cost escalation 5% every year	0	232.85	250.64	269.79	290.42	312.66	336.64
Total project income (B)	0	244.37	262.15	281.30	301.94	324.17	348.15
Net cash flow (A-B)	-380.00	160.29	172.08	184.79	198.48	213.23	229.14
IRR of the project	49.30%						

2011	2012	2013	2014	2015	2016	2017	2018	2019
5.70	5.70	5.70	5.70	5.70	5.70	5.70	5.70	5.70
122.01	131.40	141.53	152.45	164.25	176.99	190.75	205.61	221.68
127.71	137.10	147.23	158.15	169.95	182.69	196.45	211.31	227.38
0	0	0	0	0	0	0	0	38
11.51	11.51	11.51	11.51	11.51	11.51	11.51	11.51	11.51
362.49	390.37	420.46	452.92	487.97	525.82	566.69	610.86	658.59
374.00	401.88	431.97	464.43	499.48	537.33	578.20	622.37	708.10
246.29	264.78	284.74	306.28	329.53	354.64	381.76	411.05	480.72

S.No	Particulars	Units	DG Based on FO
A	**Power Data**		**2x4.2 MW**
1	Gross Power Generated for DG ISO (2 x 4.2) STG (1 x 10) GTG (1 X 10 MW)	KW	8400.00
3	Plant loading	%	90%
4	Generation at Site	KW	7560.00
5	Auxilliary Consumption	KW	378
6	Net Power Generated	KW	7182.00
7	Operating hours per annum	Hours	8400
8	Units exported per annum	KWh	60328800.00
9	total electricity requirement	kwh/hour	9375
10	electricity imported to grid	kwh/hour	2193.00
B	**Steam Data**		
1	Steam generation from system	TPH	3.50
2	Steam generation from system	Tons/Annum	29400.00
3	Deficit Steam quantity	TPH	25.50
4	Additional Boiler required		Yes
5	Capacity of Additional boiler	TPH	30.00
C	**Fuel Data**		
1	**Fuel for the plant**		**Furnace Oil**
2	Fuel Required annually		
3	*Fuel for Power*	TPH or M3/Hr	1.89
4	*Fuel for steam*	TPH or M3/Hr	1.76
D	**Lube Oil Data**		
1	Lube Oil required per day	Kgs/ Day	172.37
3	Cost of Lube oil per Annum	Rs./Annum	3770550.00
H	**Estimated Project Cost(Not Plant and Machinery cost)**	Rs.	**280000000**
I	**Cost of Power**		
1	Fuel Cost for Power	Rs/kWh	2.93
2	Grid Power	Rs/kWh	1.62
4	Lube Oil Cost	Rs/kWh	0.063
5	O&M Cost (3% of capital cost)	Rs/kWh	0.14
9	Cost of Limestone	Rs/kWh	0.00
10	Cost of water	Rs/kWh	0.01
11	Cost of Ash Handling	Rs/kWh	0.00
	Total cost without grid power cost, fuel cost and O&M cost	Rs/kWh	0.07
	Total cost	Rs/kWh	4.76
	Cost after steam credit	Rs/kWh	**4.36**

STG on Petcoke+ Imp Coal	STG on Indian Coal	GTG BASED ON GAS
1 x 10 MW	1 x 10 MW	2 X 4.2 MW
10000	10000	8400.00
95%	95%	95%
9500.00	9500.00	7980.00
1250.0	1250.0	200.0
8250.00	8250.00	7780.00
8400	8400	8400
69300000.00	69300000.00	65352000.00
9375	9375	9375
1125.00	1125.00	1595.00
29.00	29.00	20.00
243600.00	243600.00	168000.00
0	0	9.00
No	No	Yes
0	0	10.00
Petcoke+Imp Coal	**Indian Coal**	**Gas**
3.99	5.42	2872.80
0.00	0.00	692.31
10	10	2
239166.00	239166.00	49000.00
380000000	**370000000**	**275000000**
1.45	1.77	3.03
0.72	0.72	1.09
0.003	0.003	0.001
0.16	0.16	0.13
0.14	0.14	0.00
0.03	0.03	0.00
0.02	0.04	0.00
0.19	0.21	0.00
2.53	2.87	4.24
1.02	**1.47**	**2.62**

Sensitivity Analysis 1 calculations for Gas Turbine Project in Apollo Tyres							
Project parameters							
Initial Investment of the proposed project (2 x 4.2 MW)	275.00						
Expected CER pricing (Rs/ ton of CO2)	308.00						
Production loss during project implementation (Rs in million)							
Year	2004	2005	2006	2007	2008	2009	2010
Expenditure							
Initial investment (equity)	275.00						
Recurring cost							
Cost of insurance (1.5% of project cost) every year		4.13	4.13	4.13	4.13	4.13	4.13
Income Tax on Energy Savings		38.76	44.21	50.09	56.45	63.32	67.02
Total cashflow out (A)	275.00	42.88	48.33	54.22	60.58	67.44	71.15
Income							
Salvage Value of project (10%)		0	0	0	0	0	0
Saving in income tax due to depreciation (33.66% of depreciated amount)		8.33	8.33	8.33	8.33	8.33	8.33
Savings in operating cost based on following figures. F.O Price of Rs. 11.144/kg with 8% Escalation, Grid power at price of Rs. 5.3/kWh with 8% escalation, N.G. Price of Rs. 8.2/SM3 with constant price for first 5 years and 12% Escalation for next 5 years, Maintenance cost escalation 5% every year	0	115.14	131.33	148.83	167.71	188.11	199.11
CER credits	0	14.43	14.43	14.43	14.43	14.43	14.43
Total project income without considering CER credits(B)	0	123.47	139.67	157.16	176.05	196.44	207.44
Total project income with considering CER credits(C)	0	137.90	154.10	171.59	190.48	210.88	221.88
Net cash flow without considering CER Credits (A-B)	-275.00	80.59	91.33	102.94	115.47	129.00	136.30
Net cash flow with considering CER Credits (A-C)	-275.00	95.02	105.77	117.37	129.90	143.43	150.73
IRR of the project without considering CER credits	38.75%						
IRR of the project with considering CER credits	43.24%						

2011	2012	2013	2014	2015	2016	2017	2018	2019
4.13	4.13	4.13	4.13	4.13	4.13	4.13	4.13	4.13
71.84	74.86	78.99	83.23	87.58	92.01	96.51	101.04	105.56
75.97	78.99	83.11	87.36	91.70	96.14	100.64	105.16	109.68
0	0	0	0	0	0	0	0	27.5
8.33	8.33	8.33	8.33	8.33	8.33	8.33	8.33	8.33
213.43	222.41	234.66	247.27	260.19	273.36	286.72	300.17	313.60
14.43	14.43	14.43	14.43	14.43	14.43	14.43	14.43	14.43
221.76	230.74	242.99	255.60	268.52	281.70	295.05	308.50	349.43
236.19	245.17	257.42	270.03	282.95	296.13	309.48	322.93	363.86
145.79	151.75	159.88	168.24	176.82	185.56	194.42	203.34	239.75
160.23	166.18	174.31	182.68	191.25	199.99	208.85	217.77	254.18

S.No	Particulars	Units	DG Based on FO
A	**Power Data**		**2x4.2 MW**
1	Gross Power Generated for DG ISO (2 x 4.2) STG (1 x 10) GTG (1 X 10 MW)	KW	8400.00
3	Plant loading	%	90%
4	Generation at Site	KW	7560.00
5	Auxilliary Consumption	KW	378
6	Net Power Generated	KW	7182.00
7	Operating hours per annum	Hours	8400
8	Units exported per annum	KWh	60328800.00
9	total electricity requirement	kwh/hour	9375
10	electricity imported to grid	kwh/hour	2193.00
B	**Steam Data**		
1	Steam generation from system	TPH	3.50
2	Steam generation from system	Tons/Annum	29400.00
3	Deficit Steam quantity	TPH	25.50
4	Additional Boiler required		Yes
5	Capacity of Additional boiler	TPH	30.00
C	**Fuel Data**		
1	**Fuel for the plant**		**Furnace Oil**
2	Fuel Required annually		
3	*Fuel for Power*	TPH or M3/Hr	1.89
4	*Fuel for steam*	TPH or M3/Hr	1.76
D	**Lube Oil Data**		
1	Lube Oil required per day	Kgs/ Day	172.37
3	Cost of Lube oil per Annum	Rs./Annum	3770550.00
H	**Estimated Project Cost(Not Plant and Machinery cost)**	Rs.	**280000000**
I	**Cost of Power**		
1	Fuel Cost for Power	Rs/kWh	2.93
2	Grid Power	Rs/kWh	1.62
4	Lube Oil Cost	Rs/kWh	0.063
5	O&M Cost (3% of capital cost)	Rs/kWh	0.14
9	Cost of Limestone	Rs/kWh	0.00
10	Cost of water	Rs/kWh	0.01
11	Cost of Ash Handling	Rs/kWh	0.00
	Total cost without grid power cost, fuel cost and O&M cost	Rs/kWh	0.07
	Total cost	Rs/kWh	4.76
	Cost after steam credit	Rs/kWh	**4.36**

STG on Petcoke+ Imp Coal	STG on Indian Coal	GTG BASED ON GAS
1 x 10 MW	1 x 10 MW	2 X 4.2 MW
10000	10000	8400.00
95%	95%	95%
9500.00	9500.00	7980.00
1250.0	1250.0	200.0
8250.00	8250.00	7780.00
8400	8400	8400
69300000.00	69300000.00	65352000.00
9375	9375	9375
1125.00	1125.00	1595.00
29.00	29.00	20.00
243600.00	243600.00	168000.00
0	0	9.00
No	No	Yes
0	0	10.00
Petcoke+Imp Coal	**Indian Coal**	**Gas**
3.99	5.42	2872.80
0.00	0.00	692.31
10	10	2
239166.00	239166.00	49000.00
380000000	**370000000**	**275000000**
1.45	1.77	3.03
0.72	0.72	1.09
0.003	0.003	0.001
0.16	0.16	0.13
0.14	0.14	0.00
0.03	0.03	0.00
0.02	0.04	0.00
0.19	0.21	0.00
2.53	2.87	4.24
1.02	**1.47**	**2.62**

Sensitivity Analysis calculations for Coal Fired Power Project in Apollo Tyres							
Project parameters							
Initial Investment of the proposed project (1 x 10 MW) (Rs in millions)	370.00						
Year	2004	2005	2006	2007	2008	2009	2010
Expenditure (Rs. In Millions)							
Initial investment (equity)	370.00						
Recurring cost							
Cost of insurance (1.5% of project cost) every year		5.55	5.55	5.55	5.55	5.55	5.55
Income Tax on Energy Savings		67.96	73.68	79.86	86.53	93.74	101.52
Total cashflow out (A)	370.00	73.51	79.23	85.41	92.08	99.29	107.07
Income (Rs. In Millions)							
Salvage Value of project (10%)		0	0	0	0	0	0
Saving in income tax due to depreciation (33.66% of depreciated amount)		11.21	11.21	11.21	11.21	11.21	11.21
Savings in operating cost based on following figures. F.O Price of Rs. 11.144/kg with 8% Escalation, Grid power at price of Rs. 5.3/kWh with 8% escalation, Indian Coal Price of Rs. 2700/Ton with 8% Escalation, Maintenance cost escalation 5% every year	0	201.91	218.90	237.25	257.07	278.48	301.60
Total project income (B)	0	213.12	230.11	248.46	268.28	289.69	312.81
Net cash flow (A-B)	-370.00	139.61	150.88	163.05	176.20	190.40	205.74
IRR of the project	45.33%						

2011	2012	2013	2014	2015	2016	2017	2018	2019
5.55	5.55	5.55	5.55	5.55	5.55	5.55	5.55	5.55
109.92	119.00	128.81	139.40	143.52	163.20	166.09	190.97	206.54
115.47	124.55	134.36	144.95	149.07	168.75	171.64	196.52	212.09
0	0	0	0	0	0	0	0	37
11.21	11.21	11.21	11.21	11.21	11.21	11.21	11.21	11.21
326.57	353.55	382.68	414.15	426.37	484.86	493.45	567.34	613.60
337.78	364.76	393.89	425.36	437.58	496.07	504.66	578.55	661.81
222.31	240.20	259.53	280.41	288.51	327.31	333.01	382.03	449.72

S.No	Particulars	Units	DG Based on FO
A	**Power Data**		**2x4.2 MW**
1	Gross Power Generated for DG ISO (2 x 4.2) STG (1 x 10) GTG (1 X 10 MW)	KW	8400.00
3	Plant loading	%	90%
4	Generation at Site	KW	7560.00
5	Auxilliary Consumption	KW	378
6	Net Power Generated	KW	7182.00
7	Operating hours per annum	Hours	8400
8	Units exported per annum	KWh	60328800.00
9	total electricity requirement	kwh/hour	9375
10	electricity imported to grid	kwh/hour	2193.00
B	**Steam Data**		
1	Steam generation from system	TPH	3.50
2	Steam generation from system	Tons/Annum	29400.00
3	Deficit Steam quantity	TPH	25.50
4	Additional Boiler required		Yes
5	Capacity of Additional boiler	TPH	30.00
C	**Fuel Data**		
1	**Fuel for the plant**		**Furnace Oil**
2	Fuel Required annually		
3	*Fuel for Power*	TPH or M3/Hr	1.89
4	*Fuel for steam*	TPH or M3/Hr	1.76
D	**Lube Oil Data**		
1	Lube Oil required per day	Kgs/ Day	172.37
3	Cost of Lube oil per Annum	Rs./Annum	3770550.00
H	**Estimated Project Cost(Not Plant and Machinery cost)**	Rs.	**280000000**
I	**Cost of Power**		
1	Fuel Cost for Power	Rs/kWh	2.93
2	Grid Power	Rs/kWh	1.62
4	Lube Oil Cost	Rs/kWh	0.063
5	O&M Cost (3% of capital cost)	Rs/kWh	0.14
9	Cost of Limestone	Rs/kWh	0.00
10	Cost of water	Rs/kWh	0.01
11	Cost of Ash Handling	Rs/kWh	0.00
	Total cost without grid power cost, fuel cost and O&M cost	Rs/kWh	0.07
	Total cost	Rs/kWh	4.76
	Cost after steam credit	Rs/kWh	**4.36**

STG on Petcoke+ Imp Coal	STG on Indian Coal	GTG BASED ON GAS
1 x 10 MW	1 x 10 MW	2 X 4.2 MW
10000	10000	8400.00
95%	95%	95%
9500.00	9500.00	7980.00
1250.0	1250.0	200.0
8250.00	8250.00	7780.00
8400	8400	8400
69300000.00	69300000.00	65352000.00
9375	9375	9375
1125.00	1125.00	1595.00
29.00	29.00	20.00
243600.00	243600.00	168000.00
0	0	9.00
No	No	Yes
0	0	10.00
Petcoke+Imp Coal	**Indian Coal**	**Gas**
3.99	5.42	2872.80
0.00	0.00	692.31
10	10	2
239166.00	239166.00	49000.00
380000000	**370000000**	**275000000**
1.45	1.77	3.03
0.72	0.72	1.09
0.003	0.003	0.001
0.16	0.16	0.13
0.14	0.14	0.00
0.03	0.03	0.00
0.02	0.04	0.00
0.19	0.21	0.00
2.53	2.87	4.24
1.02	**1.47**	**2.62**

Sensitivity Analysis calculations for Petcoke Fired Power Project in Apollo Tyres							
Project parameters							
Initial Investment of the proposed project (1 x 10 MW) (Rs in millions)	380.00						
Year	2004	2005	2006	2007	2008	2009	2010
Expenditure							
Initial investment (equity)	380.00						
Recurring cost							
Cost of insurance (1.5% of project cost) every year		5.70	5.70	5.70	5.70	5.70	5.70
Income Tax on Energy Savings		74.72	81.03	87.86	95.23	103.19	111.78
Total cashflow out (A)	380.00	80.42	86.73	93.56	100.93	108.89	117.48
Income							
Salvage Value of project (10%)		0	0	0	0	0	0
Saving in income tax due to depreciation (33.66% of depreciated amount)		11.51	11.51	11.51	11.51	11.51	11.51
Savings in operating cost based on following figures. F.O Price of Rs. 11.144/kg with 8% Escalation, Grid power at price of Rs. 5.3/kWh with 8% escalation Petcoke Price of Rs. 3000/Ton with 8% Escalation, Maintenance cost escalation 5% every year	0	221.98	240.74	261.01	282.90	306.55	332.10
Total project income (B)	0	233.49	252.26	272.52	294.41	318.06	343.61
Net cash flow (A-B)	-380.00	153.08	165.52	178.97	193.49	209.18	226.13
IRR of the project	48.05%						

2011	2012	2013	2014	2015	2016	2017	2018	2019
5.70	5.70	5.70	5.70	5.70	5.70	5.70	5.70	5.70
121.07	131.11	141.95	153.66	166.30	179.97	194.72	210.67	227.89
126.77	136.81	147.65	159.36	172.00	185.67	200.42	216.37	233.59
0	0	0	0	0	0	0	0	38
11.51	11.51	11.51	11.51	11.51	11.51	11.51	11.51	11.51
359.70	389.51	421.71	456.50	494.07	534.66	578.50	625.86	677.02
371.21	401.02	433.22	468.01	505.58	546.17	590.02	637.38	726.53
244.43	264.21	285.57	308.65	333.58	360.50	389.59	421.01	492.95

S.No	Particulars	Units	DG Based on FO
A	**Power Data**		**2x4.2 MW**
1	Gross Power Generated for DG ISO (2 x 4.2) STG (1 x 10) GTG (1 X 10 MW)	KW	8400.00
3	Plant loading	%	90%
4	Generation at Site	KW	7560.00
5	Auxilliary Consumption	KW	378
6	Net Power Generated	KW	7182.00
7	Operating hours per annum	Hours	8400
8	Units exported per annum	KWh	60328800.00
9	total electricity requirement	kwh/hour	9375
10	electricity imported to grid	kwh/hour	2193.00
B	**Steam Data**		
1	Steam generation from system	TPH	3.50
2	Steam generation from system	Tons/Annum	29400.00
3	Deficit Steam quantity	TPH	25.50
4	Additional Boiler required		Yes
5	Capacity of Additional boiler	TPH	30.00
C	**Fuel Data**		
1	**Fuel for the plant**		**Furnace Oil**
2	Fuel Required annually		
3	*Fuel for Power*	TPH or M3/Hr	1.89
4	*Fuel for steam*	TPH or M3/Hr	1.76
D	**Lube Oil Data**		
1	Lube Oil required per day	Kgs/ Day	172.37
3	Cost of Lube oil per Annum	Rs./Annum	3770550.00
H	**Estimated Project Cost(Not Plant and Machinery cost)**	Rs.	**280000000**
I	**Cost of Power**		
1	Fuel Cost for Power	Rs/kWh	3.16
2	Grid Power	Rs/kWh	1.62
4	Lube Oil Cost	Rs/kWh	0.06
5	O&M Cost (3% of capital cost)	Rs/kWh	0.14
9	Cost of Limestone	Rs/kWh	0.00
10	Cost of water	Rs/kWh	0.01
11	Cost of Ash Handling	Rs/kWh	0.00
	Total cost without grid power cost, fuel cost and O&M cost	Rs/kWh	0.07
	Total cost	Rs/kWh	4.98
	Cost after steam credit	Rs/kWh	**4.58**

STG on Petcoke+ Imp Coal	STG on Indian Coal	GTG BASED ON GAS
1 x 10 MW	1 x 10 MW	2 X 4.2 MW
10000	10000	8400.00
95%	95%	95%
9500.00	9500.00	7980.00
1250.0	1250.0	200.0
8250.00	8250.00	7780.00
8400	8400	8400
69300000.00	69300000.00	65352000.00
9375	9375	9375
1125.00	1125.00	1595.00
29.00	29.00	20.00
243600.00	243600.00	168000.00
0	0	9.00
No	No	Yes
0	0	10.00
Petcoke+Imp Coal	**Indian Coal**	**Gas**
3.99	5.42	2872.80
0.00	0.00	692.31
10	10	2
239166.00	239166.00	49000.00
430000000	**430000000**	**275000000**
1.45	1.77	3.03
0.72	0.72	1.09
0.02	0.02	0.01
0.19	0.19	0.13
0.14	0.14	0.00
0.03	0.03	0.00
0.02	0.04	0.00
0.21	0.23	0.01
2.57	2.91	4.25
1.07	**1.52**	**2.63**

Sensitivity Analysis calculations for Gas Turbine Project in Apollo Tyres							
Project parameters							
Initial Investment of the proposed project (2 x 4.2 MW)	275.00						
Expected CER pricing (Rs/ ton of Co2)	336.00						
Production loss during project implementation (Rs in million)							
Year	2004	2005	2006	2007	2008	2009	2010
Expenditure							
Initial investment (equity)	275.00						
Recurring cost							
Cost of insurance (1.5% of project cost) every year		4.13	4.13	4.13	4.13	4.13	4.13
Income Tax on Energy Savings		38.76	43.55	48.70	54.23	60.16	63.43
Total cashflow out (A)	275.00	42.88	47.68	52.83	58.35	64.28	67.56
Income							
Salvage Value of project (10%)		0	0	0	0	0	0
Saving in income tax due to depreciation (33.66% of depreciated amount)		8.33	8.33	8.33	8.33	8.33	8.33
Savings in operating cost based on following figures. F.O Price of Rs. 11.144/kg with 6.4% Escalation, Grid power at price of Rs. 5.3/kWh with 10.1% escalation N.G. Price of Rs. 8.2/SM3 with constant price for first 5 years and 10% Escalation for next 5 years Maintenance cost escalation 5%	0	115.14	129.39	144.68	161.10	178.72	188.45
CER credits		15.74	15.74	15.74	15.74	15.74	15.74
Total project income without considering CER credits(B)	0	123.47	137.72	153.01	169.43	187.05	196.78
Total project income with considering CER credits(C)	0	139.21	153.46	168.76	185.17	202.79	212.52
Net cash flow without considering CER Credits (A-B)	-275.00	80.59	90.04	100.19	111.08	122.77	129.22
Net cash flow with considering CER Credits (A-C)	-275.00	96.33	105.79	115.93	126.82	138.51	144.97
IRR of the project without considering CER credits	37.74%						
IRR of the project with considering CER credits	42.60%						

2011	2012	2013	2014	2015	2016	2017	2018	2019
4.13	4.13	4.13	4.13	4.13	4.13	4.13	4.13	4.13
67.59	70.48	74.25	78.21	82.36	86.69	91.21	95.94	100.86
71.71	74.60	78.38	82.34	86.48	90.81	95.34	100.06	104.99
0	0	0	0	0	0	0	0	27.5
8.33	8.33	8.33	8.33	8.33	8.33	8.33	8.33	8.33
200.80	209.37	220.60	232.36	244.67	257.54	270.99	285.02	299.66
15.74	15.74	15.74	15.74					
209.13	217.71	228.93	240.69	253.00	265.87	279.32	293.35	335.49
224.87	233.45	244.68	256.44	253.00	265.87	279.32	293.35	335.49
137.42	143.10	150.55	158.35	166.52	175.06	183.98	193.29	230.50
153.16	158.85	166.30	174.10	166.52	175.06	183.98	193.29	230.50

S.No	Particulars	Units	DG Based on FO
A	**Power Data**		**2x4.2 MW**
1	Gross Power Generated for DG ISO (2 x 4.2) STG (1 x 10) GTG (1 X 10 MW)	KW	8400.00
3	Plant loading	%	90%
4	Generation at Site	KW	7560.00
5	Auxilliary Consumption	KW	378
6	Net Power Generated	KW	7182.00
7	Operating hours per annum	Hours	8400
8	Units exported per annum	KWh	60328800.00
9	total electricity requirement	kwh/hour	9375
10	electricity imported to grid	kwh/hour	2193.00
B	**Steam Data**		
1	Steam generation from system	TPH	3.50
2	Steam generation from system	Tons/Annum	29400.00
3	Deficit Steam quantity	TPH	25.50
4	Additional Boiler required		Yes
5	Capacity of Additional boiler	TPH	30.00
C	**Fuel Data**		
1	**Fuel for the plant**		**Furnace Oil**
2	Fuel Required annually		
3	*Fuel for Power*	TPH or M3/Hr	1.89
4	*Fuel for steam*	TPH or M3/Hr	1.76
D	**Lube Oil Data**		
1	Lube Oil required per day	Kgs/ Day	172.37
3	Cost of Lube oil per Annum	Rs./Annum	3770550.00
H	**Estimated Project Cost(Not Plant and Machinery cost)**	Rs.	**280000000**
I	**Cost of Power**		
1	Fuel Cost for Power	Rs/kWh	2.93
2	Grid Power	Rs/kWh	1.62
4	Lube Oil Cost	Rs/kWh	0.063
5	O&M Cost (3% of capital cost)	Rs/kWh	0.14
9	Cost of Limestone	Rs/kWh	0.00
10	Cost of water	Rs/kWh	0.01
11	Cost of Ash Handling	Rs/kWh	0.00
	Total cost without grid power cost, fuel cost and O&M cost	Rs/kWh	0.07
	Total cost	Rs/kWh	4.76
	Cost after steam credit	Rs/kWh	**4.36**

STG on Petcoke+ Imp Coal	STG on Indian Coal	GTG BASED ON GAS
1 x 10 MW	1 x 10 MW	2 X 4.2 MW
10000	10000	8400.00
95%	95%	95%
9500.00	9500.00	7980.00
1250.0	1250.0	200.0
8250.00	8250.00	7780.00
8400	8400	8400
69300000.00	69300000.00	65352000.00
9375	9375	9375
1125.00	1125.00	1595.00
29.00	29.00	20.00
243600.00	243600.00	168000.00
0	0	9.00
No	No	Yes
0	0	10.00
Petcoke+Imp Coal	**Indian Coal**	**Gas**
3.99	5.42	2872.80
0.00	0.00	692.31
10	10	2
239166.00	239166.00	49000.00
380000000	**370000000**	**275000000**
1.45	1.77	3.03
0.72	0.72	1.09
0.003	0.003	0.001
0.16	0.16	0.13
0.14	0.14	0.00
0.03	0.03	0.00
0.02	0.04	0.00
0.19	0.21	0.00
2.53	2.87	4.24
1.02	**1.47**	**2.62**

Power Plants	Capacity	Date of Commissioning	Source/ Comments
Gujarat			
Hydro			
Ukai Unit-I	75	8-Jul-74	http://www.gseb.com/uh.php?PowerStationID=1
Ukai Unit-II	75	13-Dec-74	
Ukai Unit-III	75	22-Apr-75	
Ukai Unit-IV	75	4-Mar-76	
Ukai Unit-V	2.5	8-Dec-87	
Ukai Unit-VI	2.5	19-Feb-88	
Ukai (LBCH)	5	1987-1988	http://www.cea.nic.in/opt1_design_engg_hydro.pdf
Kadana Unit-I	60	31/3/1990	http://www.gseb.com/uh.php?PowerStationID=8
Kadana Unit-II	60	9/1/1990	
Kadana Unit-III	60	1/2/1998	
Kadana Unit-IV	60	27/5/1998	
Kadana Unit-V	1	24/3/1994	
Kadana Unit-VI	1	31/3/1994	
Panam Canal Unit-1	1	24/3/1994	http://www.gseb.com/gerc_index.htm (Petition for Aggregate Revenue Requirement for the
Panam Canal Unit-2	1	31/3/1994	
Sardar Sarovar RBPH Unit-I	200	1/2/2005	WREB Annual Report (2004-2005) Annex-VII (16% of 450MW)
Sardar Sarovar CHPH Unit-I	50	4/10/2004	
Sardar Sarovar CHPH Unit-II	50	16/8/2004	
Sardar Sarovar CHPH Unit-III	50	31/8/2004	
Sardar Sarovar CHPH Unit-IV	50	3/5/2004	
Sardar Sarovar CHPH Unit-V	50	15/12/2004	
Gas			
Dhuvaran GT-1	27	27/5/1970	http://www.cea.nic.in/opm/anu0001/SEC10.pdf
Dhuvaran GT-2	27	10/8/1970	
Dhuvaran CCCP GT	67.85	4/6/2003	CEA General Review (2005):Table No. 2.7
Dhuvaran CCCP ST	38.77	22/9/2003	
Utran Unit-1	30	17/12/1992	http://www.gseb.com/uh.php?PowerStationID=7
Utran Unit-2	30	28/12/1992	
Utran Unit-3	30	7/5/1992	
Utran Unit-4	45	17/7/1993	
Hazira CCGP - GSEL Surat	52	30/9/2001	CEA: Performance Review (2004-2005):Section 10
Hazira CCGP - GSEL Surat	52	16/10/2001	
Hazira CCGP - GSEL Surat	52.1	31/3/2002	
Gas (Private Sector)			
AE Co. Gas (Vatwa)	116	1991	http://www.tce.co.in/brochures/Ccpp/ccppa4.pdf
GIPCL	145	Feb-92	http://www.gipcl.com/
GIPCL	160	Nov-97	
Essar Gas	515 (300 MW to GEB)	1997	http://www.essar.com/power/plants.htm
GPEC	655	1998	http://www.clpgroup.com/NR/exeres/73212876-BBCA-488D-AB51-12AE87E80EEE%2C4C80FCB8-AA49-46F4-ADDE-FA8D616C2A12%2Cframeless.htm?ch=%5FCLPPA%5FAsiaPacific%5F&lang=en
Gas (Central Sector)			
Central	424		Considered Below
Coal			
Dhuvaran Unit-1	63.5	12/7/1965	http://www.gseb.com/uh.php?PowerStationID=2
Dhuvaran Unit-2	63.5	29/4/1965	
Dhuvaran Unit-3	63.5	17/2/1965	
Dhuvaran Unit-4	63.5	17/12/1964	
Dhuvaran Unit-5	140	27/5/1972	
Dhuvaran Unit-6	140	10/9/1972	
Ukai Unit-1	120	29/3/1976	http://www.gseb.com/uh.php?PowerStationID=9
Ukai Unit-2	120	23/6/1976	
Ukai Unit-3	200	21/1/1979	
Ukai Unit-4	200	9/11/1979	
Ukai Unit-5	210	30/1/1985	
Gandhinagar Unit-1	120	13/3/1977	http://www.gseb.com/uh.php?PowerStationID=3
Gandhinagar Unit-2	120	10/4/1977	
Gandhinagar Unit-3	210	2/3/1990	
Gandhinagar Unit-4	210	20/7/1991	
Gandhinagar Unit-5	210	17/3/1998	
Wanakbori Unit-1	210	23/3/1982	http://www.gseb.com/uh.php?PowerStationID=4
Wanakbori Unit-2	210	15/1/1983	
Wanakbori Unit-3	210	15/3/1984	
Wanakbori Unit-4	210	3/9/1986	
Wanakbori Unit-5	210	23/9/1986	
Wanakbori Unit-6	210	18/11/1987	
Wanakbori Unit-7	210	31/12/1998	
Sikka Unit-1	120	26/3/1988	http://www.gseb.com/uh.php?PowerStationID=5
Sikka Unit-2	120	31/3/1993	
Kutch Lignite Unit-1	70	29/3/1990	http://www.gseb.com/uh.php?PowerStationID=6
Kutch Lignite Unit-2	70	25/3/1991	
Kutch Lignite Unit-3	75	31/3/1997	
Akrimota Lignite	125	31/3/2005	WREB Annual Report (2004-2005): Annex-VII
Coal (Private Sector)			
Gujarat electric Co.			It includes Wanakbori Unit-7 and Gandhinagar Unit-5 which have already been considered above
AE Co. Sabarmati	2x3.75	1934	http://www.torrentpower.com/investors/inv_cp_hd.php
AE Co. Sabarmati (C-1 Station)	4x15	1954-1958	
AE Co. Sabarmati (D Station)	110	1979	
AE Co. Sabarmati (E Station)	110	1985	
AE Co. Sabarmati (F Station)	110	1988	
GIPCL-Surat Lignite	250	Nov-99	http://www.gipcl.com/

Coal (Central Sector)			
Central	829		Considered Below
Nuclear (Central Sector)			
Central	285		Considered Below
Diesel			
Diesel Power	17.48		No generation from diesel in 2004-2005, hence need not to be considered for BM calculation
Wind			
Wind Power	236.67		No generation from diesel in 2004-2005, hence need not to be considered for BM calculation

Power Plants	Capacity	Date of Commissioning	Source/ Comments
Madhya Pradesh			
Hydro			
Gandhisagar Unit-1	5x23=115 (50%)	19/11/1960	http://www.mperc.org/mppower1.html
Gandhisagar Unit-2		19/11/1960	
Gandhisagar Unit-3		19/11/1960	
Gandhisagar Unit-4		19/8/1963	
Gandhisagar Unit-5		3/11/1966	
R.P.Sagar	4x43=172 (50%)		Being low-cost power generation sources, these plants are considered for BM claculation to arrive at a conservative
Jawahar Sagar	3x33=99 (50%)		
Pench Unit-1	80	9/9/1986	http://www.mperc.org/mppower1.html
Pench Unit-2	80	9/3/1987	
Bargi Unit-1	45	3/6/1988	http://www.mperc.org/mppower1.html
Bargi Unit-2	45	29/11/1992	
Birsinghpur	20	1/11/1991	http://www.mperc.org/mppower1.html
Bansagar Tons (Stage-I) Unit-1	105	27/9/1991	http://www.mperc.org/mppower1.html
Bansagar Tons (Stage-I) Unit-2	105	3/9/1992	
Bansagar Tons (Stage-I) Unit-3	105	3/8/1992	
Bansagar (Stage-II) Unit-1	15	28/8/2002	
Bansagar (Stage-II) Unit-2	15	1/9/2002	
Bansagar (Stage-III) Unit-1	20	18/7/2001	
Bansagar (Stage-III) Unit-2	20	25/8/2001	
Bansagar (Stage-III) Unit-3	20	2/9/2002	
Rajghat Unit-1	15 (50%)	15/10/1999	http://www.mperc.org/mppower1.html
Rajghat Unit-2	15 (50%)	29/9/1999	
Rajghat Unit-3	15 (50%)	3/11/1999	
Sardar Sarovar RBPH Unit-I	200	1/2/2005	WREB Annual Report (2004-2005) Annex-VII
Sardar Sarovar CHPH Unit-I	50	4/10/2004	
Sardar Sarovar CHPH Unit-II	50	16/8/2004	
Sardar Sarovar CHPH Unit-III	50	31/8/2004	
Sardar Sarovar CHPH Unit-IV	50	3/5/2004	
Sardar Sarovar CHPH Unit-V	50	15/12/2004	
Mini-Micro Hydro			
Morand Unit-1	0.335	31/3/1990	http://www.mperc.org/mppower1.html
Morand Unit-2	0.335	9/12/1990	
Morand Unit-3	0.335	28/3/1991	
Satpura Unit-1	0.5	9/2/1996	
Satpura Unit-2	0.5	9/2/1997	
Tilwara	0.25	2/1/1997	
Chargaon	0.8	7/2/1997	
Bhimgarh Unit-1	1.2	17/2/1998	
Bhimgarh Unit-2	1.2	10/3/1998	
Hydro (Central)			
Indira Sagar Unit-1	125	1/1/2004	CEA General Review (2005):Table No. 2.7
Indira Sagar Unit-2	125	18/1/2004	
Indira Sagar Unit-3	125	27/2/2004	
Indira Sagar Unit-4	125	28/3/2004	
Indira Sagar Unit-5	125	23/7/2004	WREB Annual Report (2004-2005): Annex-VII
Indira Sagar Unit-6	125	29/12/2004	
Indira Sagar Unit-7	125	27/10/2004	
Indira Sagar Unit-8	125	23/3/2005	
Gas			
State Sector	0		
Central Sector	257		Considered Below
Coal			
Amarkantak Unit-I	30	1/2/1965	http://www.mperc.org/mppower1.html
Amarkantak Unit-II	20	8/2/1965	
Amarkantak Unit-III	120	23/11/1977	
Amarkantak Unit-IV	120	16/5/1978	
Satpura Unit-I	62.5	6/10/1967	http://www.mperc.org/mppower1.html
Satpura Unit-II	62.5	21/3/1968	
Satpura Unit-III	62.5	14/5/1968	
Satpura Unit-IV	62.5	10/7/1968	
Satpura Unit-V	62.5	17/4/1970	
Satpura Unit-VI	200	1/7/1979	
Satpura Unit-VII	210	20/9/1980	
Satpura Unit-VIII	210	25/1/1983	
Satpura Unit-IX	210	7/2/1984	
Sanjay Gandhi Unit-I	210	26/3/1993	http://www.mperc.org/mppower1.html
Sanjay Gandhi Unit-II	210	27/3/1994	
Sanjay Gandhi Unit-III	210	28/2/1999	
Sanjay Gandhi Unit-IV	210	23/11/1999	

Coal (Private Sector)			
Nil	0		
Coal (Central Sector)			
Central	1058		Considered Below
Nuclear (Central Sector)			
Central	93		Considered Below
Diesel			
Diesel Power	0		
Wind			
Wind Power	35.61		No generation from diesel in 2004-2005, hence need not to be considered for BM calculation

Power Plants	Capacity	Date of Commissioning	Source/ Comments
Chattisgarh			
Hydro			
Hasdeo Bango Unit-1	40	21/3/1994	http://www.cseb-powerhub.com/generation.htm
Hasdeo Bango Unit-2	40	21/11/1994	
Hasdeo Bango Unit-3	40	11/1/1995	
Gangrel Unit-1	2.5	2/4/2004	http://www.cseb-powerhub.com/generation.htm
Gangrel Unit-2	2.5	29/6/2004	
Gangrel Unit-3	2.5	17/10/2004	
Gangrel Unit-4	2.5	5/11/2004	
Gas			
State	0		
Central	0		
Coal			
Korba (E) Power House-II Unit-1	50	5/9/1966	http://www.cseb-powerhub.com/generation.htm
Korba (E) Power House-II Unit-2	50	16/5/1967	
Korba (E) Power House-II Unit-3	50	23/3/1968	
Korba (E) Power House-II Unit-4	50	31/10/1968	
Korba (E) Power House-III Unit-5	120	27/4/1976	
Korba (E) Power House-III Unit-6	120	5/4/1981	
Korba (W) Power House-I Unit-1	210	21/8/1983	http://www.cseb-powerhub.com/generation.htm
Korba (W) Power House-I Unit-2	210	31/3/1984	
Korba (W) Power House-II Unit-3	210	28/3/1985	
Korba (W) Power House-II Unit-4	210	13/3/1986	
Coal (Private Sector)			
Nil	0		
Coal (Central Sector)			
Central	210		Considered Below
Nuclear (Central Sector)			
Central	0		
Diesel			
Diesel Power	0		
Wind			
Wind Power	11.51		No generation from diesel in 2004-2005, hence need not to be considered for BM calculation

Power Plants	Capacity	Date of Commissioning	Source/ Comments
Maharashtra			
Hydro			
Koyna Stage-I Unit-1	70	16/5/1962	http://www.mahagenco.in/genstats/gg99.shtm
Koyna Stage-I Unit-2	70	2/6/1962	
Koyna Stage-I Unit-3	70	28/1/1963	
Koyna Stage-I Unit-4	70	29/2/1963	
Koyna Stage-II Unit-1	80	30/6/1967	http://www.mahagenco.in/genstats/gg99.shtm
Koyna Stage-II Unit-2	80	28/11/1966	
Koyna Stage-II Unit-3	80	22/8/1966	
Koyna Stage-II Unit-4	80	23/3/1966	
Koyna Stage-III Unit-1	80	6/7/1975	http://www.mahagenco.in/genstats/gg99.shtm
Koyna Stage-III Unit-2	80	11/1/1976	
Koyna Stage-III Unit-3	80	8/6/1977	
Koyna Stage-III Unit-4	80	2/10/1978	
Koyna Stage-IV Unit-1	250	20/6/1999	http://www.mahagenco.in/genstats/gg99.shtm
Koyna Stage-IV Unit-2	250	25/11/1999	
Koyna Stage-IV Unit-3	250	3/3/2000	
Koyna Stage-IV Unit-4	250	3/5/2000	
Koyna-DPH Unit-1	20	3/10/1980	http://www.mahagenco.in/genstats/gg99.shtm
Koyna-DPH Unit-2	20	16/3/1981	
Vaitarna	60	26/6/1976	http://www.mahagenco.in/genstats/gg98.shtm
Vaitarna Dam Toe	1.5	21/9/1987	http://www.mahagenco.in/genstats/gg98.shtm
Bhira-TR Unit-1	40	13/9/1987	http://www.mahagenco.in/genstats/gg100.shtm
Bhira-TR Unit-2	40	29/3/1988	
Eldari Unit-1	7.5	16/6/1968	http://www.mahagenco.in/genstats/gg100.shtm
Eldari Unit-2	7.5	10/5/1968	
Eldari Unit-3	7.5	20/3/1968	
Vir Unit-1	4.5	20/2/1975	http://www.mahagenco.in/genstats/gg99.shtm
Vir Unit-2	4.5	17/2/1975	
Bhatghar	16	2/8/1977	http://www.mahagenco.in/genstats/gg99.shtm
Tilari	60	10/10/1986	http://www.mahagenco.in/genstats/gg100.shtm
Radhanagari	4x1.2=4.8	1952	http://www.mahagenco.in/genstats/gg100.shtm
Bhandardara Stage-I	10	27/3/1986	http://www.mahagenco.in/genstats/gg99.shtm
Bhandardara Stage-II	34	19/5/1999	http://www.mahagenco.in/genstats/gg100.shtm
Pawana	10	11/6/1988	http://www.mahagenco.in/genstats/gg99.shtm
Bhatsa	15	28/9/1991	http://www.mahagenco.in/genstats/gg99.shtm

Dhom Unit-1	1	13/3/1992	http://www.mahagenco.in/genstats/gg100.shtm
Dhom Unit-2	1	31/3/1992	
Kanhar	4	18/8/1991	http://www.mahagenco.in/genstats/gg100.shtm
Manikdoh	6	9/2/1998	http://www.mahagenco.in/genstats/gg100.shtm
Ujjani	12	2/5/1994	http://www.mahagenco.in/genstats/gg100.shtm
Paithan	12	1/11/1984	http://www.mahagenco.in/genstats/gg100.shtm
Pench Unit-1 (33.33% Share)	80	9/9/1986	http://www.mahagenco.in/genstats/gg100.shtm
Pench Unit-2 (33.33% Share)	80	9/3/1987	
Surya	6	1/1/1999	http://www.mahagenco.in/genstats/gg100.shtm
Surya CDPH	0.75	4/6/1999	http://www.mahagenco.in/genstats/gg100.shtm
Dimbhe	5	17/10/1998	http://www.mahagenco.in/genstats/gg100.shtm
Panshet	8	31/3/1991	http://www.mahagenco.in/genstats/gg99.shtm
Varasgaon	8	21/8/1991	http://www.mahagenco.in/genstats/gg100.shtm
Warna Unit-1	8	16/9/1998	http://www.mahagenco.in/genstats/gg100.shtm
Warna Unit-2	8	1/9/1999	
Dudhganga Unit-1	12	27/2/2001	http://www.mahagenco.in/genstats/gg100.shtm
Dudhganga Unit-2	12	31/3/2000	
Terwanmedhe	0.2	31/3/1999	http://www.mahagenco.in/genstats/gg100.shtm
Yeoteshwar	0.08		Being low-cost power generation sources, these plants are
Sardar Sarovar RBPH Unit-I	200	1/2/2005	WREB Annual Report (2004-2005) Annex-VII (27% 0f 450MW)
Sardar Sarovar CHPH Unit-I	50	4/10/2004	
Sardar Sarovar CHPH Unit-II	50	16/8/2004	
Sardar Sarovar CHPH Unit-III	50	31/8/2004	
Sardar Sarovar CHPH Unit-IV	50	3/5/2004	
Sardar Sarovar CHPH Unit-V	50	15/12/2004	
Majalgaon Unit-1	0.75	1/1/2002	http://www.mahagenco.in/genstats/gg100.shtm
Majalgaon Unit-2	0.75	1/1/2002	
Majalgaon Unit-3	0.75	1/1/2002	
Karanjavan	3	26/10/2001	http://www.mahagenco.in/genstats/gg100.shtm
Hydro (Private Sector)			
Tata (H) Bhira Unit-1 to 6	150	1922	http://www.mahagenco.in/genstats/gg98.shtm
Tata (H) Bhivpuri Unit-1 to 6	72	1925	
Tata (H) Khopoli Unit-1 to 6	72	1927 (5 Units) 1952 (1 Unit)	
Tata (H) Bhira PSU	150	1997	
Gas			
Uran Unit-1	60	20/2/1982	http://www.mahagenco.in/genstats/gg98.shtm
Uran Unit-2	60	29/3/1982	
Uran Unit-3	60	26/5/1982	
Uran Unit-4	60	21/7/1982	
Uran Unit-5	108	10/10/1985	
Uran Unit-6	108	2/8/1985	
Uran Unit-7	108	17/6/1985	
Uran Unit-8	108	15/1/1986	
Uran WHR Unit-1	120	16/3/1994	http://www.mahagenco.in/genstats/gg98.shtm
Uran WHR Unit-2	120	28/10/1994	
Gas (Private Sector)			
Trombay			Not a low-cost power generation source, hence not considered for BM calculation to be on a conservative side
Dhabol	740	13/5/1999	http://www.mahagenco.in/genstats/gg98.shtm
Gas (Central Sector)			
Central	404		Considered Below
Coal			
Nasik Unit-1	140	16/8/1970	http://www.mahagenco.in/genstats/gg98.shtm
Nasik Unit-2	140	21/3/1972	
Nasik Unit-3	210	26/4/1979	
Nasik Unit-4	210	10/7/1980	
Nasik Unit-5	210	30/1/1981	
Koradi Unit-1	120	3/6/1974	http://www.mahagenco.in/genstats/gg98.shtm
Koradi Unit-2	120	24/3/1975	
Koradi Unit-3	120	3/3/1976	
Koradi Unit-4	120	22/7/1976	
Koradi Unit-5	200	15/7/1978	
Koradi Unit-6	210	30/3/1982	
Koradi Unit-7	210	13/1/1983	
Bhusawal Unit-1	62.5	17/7/1966	http://www.mahagenco.in/genstats/gg98.shtm
Bhusawal Unit-2	210	30/8/1979	
Bhusawal Unit-3	210	4/5/1982	
Parli Unit-1	30	15/11/1971	http://www.mahagenco.in/genstats/gg98.shtm
Parli Unit-2	30	17/6/1972	
Parli Unit-3	210	10/10/1980	
Parli Unit-4	210	26/3/1985	
Parli Unit-5	210	31/12/1987	
Khaparkheda Unit-1	210	26/3/1989	http://www.mahagenco.in/genstats/gg98.shtm
Khaparkheda Unit-2	210	8/1/1990	
Khaparkheda Unit-3	210	31/5/2000	
Khaparkheda Unit-4	210	7/1/2001	
Chandrapur Unit-1	210	15/8/1983	http://www.mahagenco.in/genstats/gg98.shtm
Chandrapur Unit-2	210	11/7/1984	
Chandrapur Unit-3	210	3/5/1985	
Chandrapur Unit-4	210	8/3/1986	
Chandrapur Unit-5	500	22/3/1991	
Chandrapur Unit-6	500	11/3/1992	
Chandrapur Unit-7	500	1/10/1997	
Paras	62.5	25/5/1967	http://www.mahagenco.in/genstats/gg98.shtm
Coal (Private Sector)			
Dahanu (BSES) Unit-1	250	6/1/1995	http://www.mahagenco.in/genstats/gg98.shtm
Dahanu (BSES) Unit-2	250	29/3/1995	
Trombay TPC			Not a low-cost power generation source, hence not considered for BM calculation to be on a conservative side

Coal (Central Sector)			
Central	1339		Considered Below
Nuclear (Central Sector)			
Central	312		Considered Below
Diesel			
Diesel Power	0		
Wind			
Wind Power	452.92		No generation from diesel in 2004-2005, hence need not to be considered for BM calculation

Power Plants	Capacity	Date of Commissioning	Source/ Comments
Goa			
Hydro			
Aravelam	0.05		Being a low-cost power generation source, this plant is considered for BM claculation to arrive at a conservative value of BM
Gas (Private Sector)			
Reliance Salgaonkar	48	14/8/1999	http://www.rel.co.in/aboutus/GoaPower.asp
Gas (Central Sector)			
Central	0		
Coal			
State	0		
Coal (Private Sector)			
Private Sector	0		
Coal (Central Sector)			
Central	332		Considered Below
Nuclear (Central Sector)			
Central	0		
Diesel			
Diesel Power	0		
Wind			
Wind Power	0.02		No generation from diesel in 2004-2005, hence need not to be considered for BM calculation

Power Plants	Capacity	Date of Commissioning	Source/ Comments
Daman & Diu			
Hydro			
Nil	0		
Gas			
Nil	0		
Gas (Central Sector)			
Central	4		Considered Below
Coal			
State	0		
Coal (Private Sector)			
Private Sector	0		
Coal (Central Sector)			
Central	13		Considered Below
Nuclear (Central Sector)			
Central	2		Considered Below
Diesel			
Diesel Power	0		
Wind			
Wind Power	0		

Power Plants	Capacity	Date of Commissioning	Source/ Comments
Dadra & Nagar haveli			
Hydro			
Nil	0		
Gas			
Nil	0		
Gas (Central Sector)			
Central	27		Considered Below
Coal			
State	0		
Coal (Private Sector)			
Private Sector	0		
Coal (Central Sector)			
Central	29		Considered Below
Nuclear (Central Sector)			
Central	2		Considered Below
Diesel			
Diesel Power	0		
Wind			
Wind Power	0		

Power Plants	Capacity	Date of Commissioning	Source/ Comments
Central Sector Unallocated Power			
Hydro	0		
Coal	650		Considered Below
Gas	197.59		Considered Below
Nuclear	66		Considered Below

Power Plants	Capacity	Date of Commissioning	Source/ Comments
Central Sector			
Gas			
Kawas GPS Unit-I	106	Mar-92	http://www.ntpc.co.in/powerplants/ntpc_pw_kawas.shtml
Kawas GPS Unit-II	106	May-92	
Kawas GPS Unit-III	106	Jun-92	
Kawas GPS Unit-IV	106	Aug-92	
Kawas GPS Unit-V	110.5	Feb-93	
Kawas GPS Unit-VI	110.5	Mar-93	
Gandhar GPS Unit-I	131	Mar-94	http://www.ntpc.co.in/powerplants/ntpc_pw_Jhanor.shtml
Gandhar GPS Unit-II	131	Mar-94	
Gandhar GPS Unit-III	131	May-92	

Gandhar GPS Unit-IV	255	Mar-95	
Coal			
Korba STPS Unit-I	200	Mar-83	http://www.ntpc.co.in/powerplants/ntpc_pw_korba.shtml
Korba STPS Unit-II	200	Oct-83	
Korba STPS Unit-III	200	Mar-84	
Korba STPS Unit-IV	500	May-87	
Korba STPS Unit-V	500	Mar-88	
Korba STPS Unit-VI	500	Mar-89	
Vindhyachal STPS Unit-I	210	Oct-87	http://www.ntpc.co.in/powerplants/ntpc_pw_vindhyachal.shtml
Vindhyachal STPS Unit-II	210	Jul-88	
Vindhyachal STPS Unit-III	210	Feb-89	
Vindhyachal STPS Unit-IV	210	Dec-89	
Vindhyachal STPS Unit-V	210	Mar-90	
Vindhyachal STPS Unit-VI	210	Feb-91	
Vindhyachal STPS Unit-VII	500	Mar-99	
Vindhyachal STPS Unit-VIII	500	Feb-00	
Nuclear			
Tarapur Unit-1	160	1969	http://www.dae.gov.in/taps.htm
Tarapur Unit-2	160	1969	
Kakrapar Unit-1	220	1993	http://www.dae.gov.in/kapp.htm
Kakrapar Unit-2	220	1995	

Generation Details in the Western Region for the year 2004-2005					
State	**Fuel**	**Gross MU Generated**	**Auxiliary Consumption (MU)**	**Net MU Generated**	**Source**
		2004-2005	**2004-2005**	**2004-2005**	
Gujrat					
Total Thermal	Coal	30120.94	2933.63	27187.31	WREB Annual Report (2004-2005) : Annex-XI Statewise Generation and Requirement during the year 2004-05
Total Thermal	Diesel	0.00	0.00	0.00	
Total Thermal	Gas	13366.83	261.59	13105.24	
Total Hydro	Hydro	873.19	7.07	866.12	
Total Wind	Wind	0.00	0.00	0.00	
Total Nuclear	Nuclear	0.00	0.00	0.00	
Madhya Pradesh					
Total Thermal	Coal	13502.55	1414.69	12087.86	WREB Annual Report (2004-2005) : Annex-XI Statewise Generation and Requirement during the year 2004-05
Total Thermal	Diesel	0.00	0.00	0.00	
Total Thermal	Gas	0.00	0.00	0.00	
Total Hydro	Hydro	3737.85	7.31	3730.54	
Total Wind	Wind	0.00	0.00	0.00	
Total Nuclear	Nuclear	0.00	0.00	0.00	
Chattisgarh					
Total Thermal	Coal	7924.98	782.82	7142.16	WREB Annual Report (2004-2005) : Annex-XI Statewise Generation and Requirement during the year 2004-05
Total Thermal	Diesel	0.00	0.00	0.00	
Total Thermal	Gas	0.00	0.00	0.00	
Total Hydro	Hydro	382.64	0.00	382.64	
Total Wind	Wind	0.00	0.00	0.00	
Total Nuclear	Nuclear	0.00	0.00	0.00	
Maharashtra					
Total Thermal	Coal	55543.13	4452.14	51090.99	WREB Annual Report (2004-2005) : Annex-XI Statewise Generation and Requirement during the year 2004-05 & Annex-X (6/8) for power generation from WHR
Total Thermal	Diesel	0.00	0.00	0.00	
Total Thermal	Gas	5450.19	124.89	5325.30	
Total Hydro	Hydro	5583.54	39.08	5544.46	
Total Wind	Wind	0.00	0.00	0.00	
Total Nuclear	Nuclear	0.00	0.00	0.00	
Goa					
Total Thermal	Coal	0.00	0.00	0.00	

Total Thermal	Diesel	0.00	0.00	0.00	WREB Annual Report (2004-2005) : Annex-XI Statewise Generation and Requirement during the year 2004-05
Total Thermal	Gas	138.36	0.00	138.36	
Total Hydro	Hydro	0.00	0.00	0.00	
Total Wind	Wind	0.00	0.00	0.00	
Total Nuclear	Nuclear	0.00	0.00	0.00	
D&N Haveli					
Total Thermal	Coal	0.00	0.00	0.00	WREB Annual Report (2004-2005) : Annex-XI Statewise Generation and Requirement during the year 2004-05
Total Thermal	Diesel	0.00	0.00	0.00	
Total Thermal	Gas	0.00	0.00	0.00	
Total Hydro	Hydro	0.00	0.00	0.00	
Total Wind	Wind	0.00	0.00	0.00	
Total Nuclear	Nuclear	0.00	0.00	0.00	
Daman & Diu					
Total Thermal	Coal	0.00	0.00	0.00	WREB Annual Report (2004-2005) : Annex-XI Statewise Generation and Requirement during the year 2004-2005
Total Thermal	Diesel	0.00	0.00	0.00	
Total Thermal	Gas	0.00	0.00	0.00	
Total Hydro	Hydro	0.00	0.00	0.00	
Total Wind	Wind	0.00	0.00	0.00	
Total Nuclear	Nuclear	0.00	0.00	0.00	
Central Sector Share in Western Region					
Total Thermal	Coal			32953.356	WREB Annual Report (2004-2005) : Annex-XI Statewise Generation and Requirement during the year 2004-2005 and Annex-XIII Schedule/ Drawal of Energy by Various Systems during
Total Thermal	Diesel			0.00	
Total Thermal	Gas			6703.57	
Total Hydro	Hydro			0.00	
Total Wind	Wind			0.00	
Total Nuclear	Nuclear			4496.51	
Import from other Regions					
NREB				1093.264	WREB Annual Report (2004-2005) : Annex-XIII Schedule/ Drawal of Energy by Various
SREB				1766.607	

EREB				9094.757	Systems during 2004-05
Total Import from other Regions				**11954.628**	The difference between the sum of imports from NTPC-Ramagundam and from other
Import from Self Generating Industries (Balco and Jindal)	Low Cost (Assumed for conservative estimate)			**978.14**	WREB Annual Report (2004-2005) : Annex-XI Statewise Generation and Requirement during the year 2004-05
Total Thermal Generation in WR	Coal			130461.68	
Total Thermal Generation in WR	Diesel			0.00	
Total Thermal Generation in WR	Gas			25272.47	
Total Hydro Generation in WR	Hydro			10523.76	
Total Wind Generation in WR	Wind			0.00	
Total Nuclear Generation in WR	Nuclear			4496.51	
Total Import from other Regions in WR				11954.63	
Total Import from Self Generating Industries in WR	Low Cost (Assumed for conservative estimate)			978.14	
Total Generation in WR (including Gen. from all the States, Union Territories and Central Sector Share)				**170754.42**	
Total Import from other Regions in WR				**11954.63**	
Total Import from Self Generating Industries in WR				**978.14**	
Gross Generation from all sources in WR				**183687.18**	
20% of Gross Generation from all sources in WR				**36737.437**	

Sample of Power Plants for BM Calculation								
Sr.No.	Power plant name / location	State	Year of commissioning	Fuel Type	Capacity of the new addition (MW)	Total Capacity (MW)	Generation of the Unit in 2004-2005 (MU)	Comments
1	R.P.Sagar	Madhya Pradesh		Hydro	172 (50%)		188.64	Year of commissioning for these power plants are not available. But being low-cost power generation sources, all of them are considered for BM calculation to arrive at a conservative value of BM.
2	Jawahar Sagar	Madhya Pradesh		Hydro	99 (50%)		140.52	
3	Yeoteshwar	Maharashtra		Hydro	0.08		0.00	
4	Aravelam	Goa		Hydro	0.05		0.00	
5	Akrimota Lignite	Gujarat	31/3/2005	Lignite	125		0.00	
6	Indira Sagar Unit-8	Madhya Pradesh	23/3/2005	Hydro	125	1000	0.80	
7	Sardar Sarovar RBPH Unit-1	Gujarat	1/2/2005	Hydro	200		42.13	Generation from Sardar Sarovar RBPH Unit-1 & Sardar Sarovar CHPH Unit-1 to 5
8	Sardar Sarovar RBPH Unit-1	Madhya Pradesh	1/2/2005	Hydro	200		149.65	
9	Sardar Sarovar RBPH Unit-1	Maharashtra	1/2/2005	Hydro	200		71.09	
10	Indira Sagar Unit-6	Madhya Pradesh	29/12/2004	Hydro	125	1000	41.74	
11	Gangrel Unit-4	Chattisgarh	5/11/2004	Hydro	2.5		7.52	Generation from Gangrel Unit-1 to 4
12	Indira Sagar Unit-7	Madhya Pradesh	27/10/2004	Hydro	125	1000	25.16	
13	Gangrel Unit-3	Chattisgarh	17/10/2004	Hydro	2.5		0.00	Generation already considered in Gangrel Unit-4
14	Sardar Sarovar CHPH Unit-1	Gujarat	4/10/2004	Hydro	50		0.00	Generation already considered in Sardar Sarovar RBPH Unit-1
15	Sardar Sarovar CHPH Unit-1	Madhya Pradesh	4/10/2004	Hydro	50		0.00	
16	Sardar Sarovar CHPH Unit-1	Maharashtra	4/10/2004	Hydro	50		0.00	
17	Sardar Sarovar CHPH Unit-3	Gujarat	31/8/2004	Hydro	50		0.00	
18	Sardar Sarovar CHPH Unit-3	Madhya Pradesh	31/8/2004	Hydro	50		0.00	
19	Sardar Sarovar CHPH Unit-3	Maharashtra	31/8/2004	Hydro	50		0.00	
20	Sardar Sarovar CHPH Unit-2	Gujarat	16/8/2004	Hydro	50		0.00	
21	Sardar Sarovar CHPH Unit-2	Madhya Pradesh	16/8/2004	Hydro	50		0.00	
22	Sardar Sarovar CHPH Unit-2	Maharashtra	16/8/2004	Hydro	50		0.00	
23	Indira Sagar Unit-5	Madhya Pradesh	23/7/2004	Hydro	125	1000	120.09	
24	Gangrel Unit-2	Chattisgarh	29/6/2004	Hydro	2.5		0.00	Generation already considered in Gangrel Unit-4
25	Sardar Sarovar CHPH Unit-4	Gujarat	3/5/2004	Hydro	50		0.00	Generation already considered in Sardar Sarovar RBPH Unit-1
26	Sardar Sarovar CHPH Unit-4	Madhya Pradesh	3/5/2004	Hydro	50		0.00	
27	Sardar Sarovar CHPH Unit-4	Maharashtra	3/5/2004	Hydro	50		0.00	
28	Gangrel Unit-1	Chattisgarh	2/4/2004	Hydro	2.5		0.00	Generation already considered in Gangrel Unit-4
29	Indira Sagar Unit-4	Madhya Pradesh	28/3/2004	Hydro	125	1000	138.18	
30	Indira Sagar Unit-3	Madhya Pradesh	27/2/2004	Hydro	125	1000	314.87	
31	Sardar Sarovar CHPH Unit-5	Gujarat	15/2/2004	Hydro	50		0.00	Generation already considered in Sardar Sarovar RBPH Unit-1
32	Sardar Sarovar CHPH Unit-5	Madhya Pradesh	15/2/2004	Hydro	50		0.00	
33	Sardar Sarovar CHPH Unit-5	Maharashtra	15/2/2004	Hydro	50		0.00	
34	Indira Sagar Unit-2	Madhya Pradesh	18/1/2004	Hydro	125	1000	390.83	
35	Indira Sagar Unit-1	Madhya Pradesh	1/1/2004	Hydro	125	1000	300.20	
36	Dhuvaran CCCP ST	Gujarat	22/9/2003	Gas	38.77	133.6	194.42	

37	Dhuvaran CCCP GT	Gujarat	4/6/2003	Gas	67.85	133.6	340.25	
38	Bansagar (Stage-III) Unit-3	Madhya Pradesh	2/9/2002	Hydro	20	60	26.47	Station auxiliary consumption is distributed in the ratio of installed capacity of the Units
39	Bansagar (Stage-II) Unit-2	Madhya Pradesh	1/9/2002	Hydro	15	30	34.77	Station auxiliary consumption is distributed in the ratio of installed capacity of the Units
40	Bansagar (Stage-II) Unit-1	Madhya Pradesh	28/8/2002	Hydro	15	30	33.33	
41	Hazira CCGP-GSEL Surat	Gujarat	31/3/2002	Gas	52.1	156.1	386.23	
42	Majalgaon Unit-1	Maharashtra	1/1/2002	Hydro	0.75	2.25	0.00	Assumed as no generation data is provided in WREB Annual Report (2004-2005): Annex-X
43	Majalgaon Unit-2	Maharashtra	1/1/2002	Hydro	0.75	2.25	0.00	
44	Majalgaon Unit-3	Maharashtra	1/1/2002	Hydro	0.75	2.25	0.00	
45	Karanjavan	Maharashtra	26/10/2001	Hydro	3	3	0.00	
46	Hazira CCGP-GSEL Surat	Gujarat	16/10/2001	Gas	52	156.1	377.78	
47	Hazira CCGP-GSEL Surat	Gujarat	30/9/2001	Gas	52	156.1	387.36	
48	Bansagar (Stage-III) Unit-2	Madhya Pradesh	25/8/2001	Hydro	20	60	24.68	Station auxiliary consumption is distributed in the ratio of installed capacity of the Units
49	Bansagar (Stage-III) Unit-1	Madhya Pradesh	18/7/2001	Hydro	20	60	24.51	
50	Dudhganga Unit-1	Maharashtra	27/2/2001	Hydro	12	24	62.03	Includes generation from both Dudhganga Unit-1 & 2
51	Khaparkheda Unit-4	Maharashtra	7/1/2001	Coal	210	840	1354.05	Station auxiliary consumption is distributed in the ratio of installed capacity of the Units
52	Khaparkheda Unit-3	Maharashtra	31/5/2000	Coal	210	840	1463.92	
53	Koyna (Stage-IV) Unit-4	Maharashtra	3/5/2000	Hydro	250	1000	223.01	Station auxiliary consumption is distributed
54	Dudhganga Unit-2	Maharashtra	31/3/2001	Hydro	12	24	0.00	Generation already considered in Dudhganga Unit-1
55	Koyna (Stage-IV) Unit-3	Maharashtra	3/3/2000	Hydro	250	1000	718.46	Station auxiliary consumption is distributed in the ratio of installed capacity of the Units
56	Vindhyachal STPS Unit-VIII	Central Share	February'2000	Coal	500	2260	3586.90	Station auxiliary consumption is distributed in the ratio of installed capacity of the Units
57	Koyna (Stage-IV) Unit-2	Maharashtra	25/11/1999	Hydro	250	1000	265.68	Station auxiliary consumption is distributed in the ratio of installed capacity of the Units
58	Sanjay Gandhi Unit-IV	Madhya Pradesh	23/11/1999	Coal	210	840	1332.96	Station auxiliary consumption from all the four Units is distributed in the ratio of installed capacity of the Units
59	Rajghat Unit-3	Madhya Pradesh	3/11/1999	Hydro	7.5	22.5	13.71	Station auxiliary consumption is distributed in the ratio of installed capacity of the Units
60	GIPCL-Surat Lignite	Gujarat	November'1999	Lignite	250	250	1627.53	
61	Rajghat Unit-1	Madhya Pradesh	15/10/1999	Hydro	7.5	22.5	18.75	Station auxiliary consumption is distributed in the ratio of installed capacity of the Units
62	Rajghat Unit-2	Madhya Pradesh	29/9/1999	Hydro	7.5	22.5	10.89	
63	Warna Unit-2	Maharashtra	1/9/1999	Hydro	8	16	28.34	Net generation is distributed as per the installed capacity of the Units.
64	Reliance Salgaonkar	Goa	14/8/1999	Gas	48	48	138.36	
65	Koyna (Stage-IV) Unit-1	Maharashtra	20/6/1999	Hydro	250	1000	526.76	Station auxiliary consumption is distributed in the ratio of installed capacity of the Units
66	Surya CDPH	Maharashtra	4/6/1999	Hydro	0.75	0.75	0.00	
67	Bhandardara Stage-II	Maharashtra	19/5/1999	Hydro	34	44	36.71	
68	Dhabol	Maharashtra	13/5/1999	Gas	740	740	0.00	
69	Terwanmedhe	Maharashtra	31/3/1999	Hydro	0.2	0.2	0.09	
70	Vindhyachal STPS Unit-VII	Central Share	March'1999	Coal	500	2260	3560.31	Station auxiliary consumption is distributed in the ratio of installed capacity of the Units
71	Sanjay Gandhi Unit-III	Madhya Pradesh	28/2/1999	Coal	210	840	1412.06	Station auxiliary consumption from all the four Units is distributed in the ratio of installed capacity of the Units
72	Surya	Maharashtra	1/1/1999	Hydro	6	6	13.88	
73	Dimbhe	Maharashtra	17/10/1998	Hydro	5	5	9.02	
74	Warna Unit-1	Maharashtra	16/9/1998	Hydro	8	16	28.34	Net generation is distributed as per the installed capacity of the Units.
75	Kadana Unit-IV	Gujarat	27/5/1998	Hydro	60	240	96.71	Station auxiliary consumption is distributed in the ratio of installed capacity of the Units
76	Gandhinagar Unit-5	Gujarat	17/3/1998	Coal	210	210	1423.01	
77	Bhimgarh Unit-2	Madhya Pradesh	10/3/1998	Hydro	1.2		0.00	Included in Mini-Micro Hydro Power Plants wherefrom the generation is zero in 2004

78	Bhimgarh Unit-1	Madhya Pradesh	17/2/1998	Hydro	1.2		0.00	wherefrom the generation is zero in 2004-2005
79	Manikodh	Maharashtra	9/2/1998	Hydro	6	6	4.08	
80	Kadana Unit-III	Gujarat	1/2/1998	Hydro	60	240	94.74	Station auxiliary consumption is distributed in the ratio of installed capacity of the Units
81	GPEC	Gujarat	1998	Gas	655		3565.16	
82	GIPCL	Gujarat	Nov-97	Gas	160		1098.91	
83	Chandrapur Unit-7	Maharashtra	1/10/1997	Coal	500	2340	3113.62	Station auxiliary consumption is distributed in the ratio of installed capacity of the Units
84	Kutch Lignite Unit-3	Gujarat	31/3/1997	Lignite	75	215	423.25	
85	Satpura Unit-2	Madhya Pradesh	9/2/1997	Hydro	0.5		0.00	Included in Mini-Micro Hydro Power Plants wherefrom the generation is zero in 2004-2005
86	Chargaon	Madhya Pradesh	7/2/1997	Hydro	0.8		0.00	
87	Tilwara	Madhya Pradesh	2/1/1997	Hydro	0.25		0.00	
88	Tata (H) Bhira PSU	Maharashtra	1997	Hydro	150		577.93	
89	Essar Gas	Gujarat	1997	Gas	515 (300MW to GEB)		3327.73	
90	Satpura Unit-1	Madhya Pradesh	9/2/1996	Hydro	0.5		0.00	Included in Mini-Micro Hydro Power Plants wherefrom the generation is zero in 2004-2005
91	Kakrapar Unit-2	Central Share	1995	Nuclear	220	440	1106.27	
92	Dahanu (BSES) Unit-2	Maharashtra	29/3/1995	Coal	250		2001.27	
				Total			**37025.64**	
				20% of Gross generation in the most recent year i.e. 2004-2005			**36382.56**	
				Coal			**21298.88**	
				Gas			**9816.20**	
				Hydro			**4804.29**	
				Nuclear			**1106.27**	

93	Gandhar GPS Unit-IV	Central Share	March'1995	Gas	224.5	657.4	1459.99	Station auxiliary consumption is distributed in the ratio of installed capacity of the Units
94	Hasdeo Bango Unit-3	Chattisgarh	11/1/1995	Hydro	40	120	114.91	
95	Dahanu (BSES) Unit-1	Maharashtra	6/1/1995	Coal	250		2103.78	
96	Hasdeo Bango Unit-2	Chattisgarh	21/11/1994	Hydro	40	120	136.68	
97	Uran WHR Unit-2	Maharashtra	28/10/1994	Waste Gas	120	240	690.30	Station auxiliary consumption is distributed in the ratio of installed capacity of the Units
98	Ujjani	Maharashtra	2/5/1994	Hydro	12		25.00	
99	Kadana Unit-VI	Gujarat	31/3/1994	Hydro	1		0.00	Assumed as no generation data is provided in WREB Annual Report (2004-2005): Annex-X
100	Panam Canal Unit-2	Gujarat	31/3/1994	Hydro	1	2	2.33	Net generation is distributed as per the installed capacity of the Units.
101	Sanjay Gandhi Unit-II	Madhya Pradesh	27/3/1994	Coal	210	840	1021.53	Station auxiliary consumption from all the four Units is distributed in the ratio of installed capacity of the Units
102	Panam Canal Unit-1	Gujarat	24/3/1994	Hydro	1	2	2.33	Net generation is distributed as per the installed capacity of the Units.
103	Kadana Unit-V	Gujarat	24/3/1994	Hydro	1		0.00	Assumed as no generation data is provided in WREB Annual Report (2004-2005): Annex-X
104	Hasdeo Bango Unit-1	Chattisgarh	21/3/1994	Hydro	40	120	123.53	
105	Uran WHR Unit-1	Maharashtra	16/3/1994	Waste Gas	120	240	672.16	Station auxiliary consumption is distributed in the ratio of installed capacity of the Units
106	Gandhar GPS Unit-II	Central Share	March'1994	Gas	144.3	657.4	798.05	Station auxiliary consumption is distributed
107	Gandhar GPS Unit-I	Central Share	March'1994	Gas	144.3	657.4	827.84	in the ratio of installed capacity of the Units
108	Kakrapar Unit-1	Central Share	1993	Nuclear	220	440	1070.98	
109	Utaran Unit-4	Gujarat	17/7/1993	Gas	45	135	406.95	Station auxiliary consumption is distributed in the ratio of installed capacity of the Units
110	Sikka Unit-2	Gujarat	31/3/1993	Coal	120	240	604.00	
111	Sanjay Gandhi Unit-I	Madhya Pradesh	26/3/1993	Coal	210	840	1139.37	Station auxiliary consumption from all the four Units is distributed in the ratio of installed capacity of the Units

112	Utaran Unit-2	Gujarat	28/12/1992	Gas	30	135	239.48	Station auxiliary consumption is distributed in the ratio of installed capacity of the Units
113	Utaran Unit-1	Gujarat	17/12/1992	Gas	30	135	235.58	Station auxiliary consumption is distributed in the ratio of installed capacity of the Units
114	Bargi Unit-2	Madhya Pradesh	29/11/1992	Hydro	45	90	252.34	Station auxiliary consumption is distributed in the ratio of installed capacity of the Units
115	Bansagar Tons (Stage-I) Unit-2	Madhya Pradesh	3/9/1992	Hydro	105	315	345.73	Station auxiliary consumption is distributed in the ratio of installed capacity of the Units
116	Bansagar Tons (Stage-I) Unit-3	Madhya Pradesh	3/8/1992	Hydro	105	315	231.77	
117	Utaran Unit-3	Gujarat	7/5/1992	Gas	30	135	239.82	Station auxiliary consumption is distributed in the ratio of installed capacity of the Units
118	Dhom Unit-2	Maharashtra	31/3/1992	Hydro	1	2	6.80	
119	Dhom Unit-1	Maharashtra	13/3/1992	Hydro	1	2	0.00	
120	Chandrapur Unit-6	Maharashtra	11/3/1992	Coal	500	2340	2474.09	Station auxiliary consumption is distributed in the ratio of installed capacity of the Units
121	GIPCL	Gujarat	Feb-92	Gas	145		1124.08	Import from Baroda
122	Birsinghpur	Madhya Pradesh	1/11/1991	Hydro	20	20	37.92	
123	Bhatsa	Maharashtra	28/9/1991	Hydro	15	15	66.59	
124	Bansagar Tons (Stage-I) Unit-1	Madhya Pradesh	27/9/1991	Hydro	105	315	307.80	Station auxiliary consumption is distributed in the ratio of installed capacity of the Units
125	Varasgaon	Maharashtra	21/8/1991	Hydro	8	8	36.53	
126	Kanhar	Maharashtra	18/8/1991	Hydro	4	4	8.63	
127	Gandhinagar Unit-4	Gujarat	20/7/1991	Coal	210	660	1079.55	
128	Panshet	Maharashtra	31/3/1991	Hydro	8	8	24.02	
129	Morand Unit-3	Madhya Pradesh	28/3/1991	Hydro	0.335		0.00	Included in Mini-Micro Hydro Power Plants wherefrom the generation is zero in 2004-2005
130	Kutch Lignite Unit-2	Gujarat	25/3/1991	Lignite	70	215	130.37	
131	Chandrapur Unit-5	Maharashtra	22/3/1991	Coal	500	2340	3471.73	Station auxiliary consumption is distributed in the ratio of installed capacity of the Units
132	Morand Unit-2	Madhya Pradesh	9/12/1990	Hydro	0.335		0.00	Included in Mini-Micro Hydro Power Plants wherefrom the generation is zero in 2004-2005
133	Morand Unit-1	Madhya Pradesh	31/3/1990	Hydro	0.335		0.00	
134	Kadana Unit-I	Gujarat	31/3/1990	Hydro	60	240	94.87	Station auxiliary consumption is distributed in the ratio of installed capacity of the Units
135	Kutch Lignite Unit-1	Gujarat	29/3/1990	Lignite	70	215	157.41	
136	Gandhinagar Unit-3	Gujarat	2/3/1990	Coal	210	660	804.98	
137	Kadana Unit-II	Gujarat	9/1/1990	Hydro	60	240	71.46	Station auxiliary consumption is distributed in the ratio of installed capacity of the Units
138	Khaparkheda Unit-2	Maharashtra	8/1/1990	Coal	210	840	1419.50	Station auxiliary consumption is distributed in the ratio of installed capacity of the Units

CALCULATION OF BASELINE EMISSION FACTORS		
Year of offer	2004-05	
Generation Mix		
Sector	MU	%
Thermal Coal Based-Western Region	130461.68	75.97
Thermal Diesel Based-Western Region	0.00	0.00
Thermal Gas Based-Western Region	25272.47	14.72
Hydro-Western Region	10523.76	6.13
Wind-Western Region	0.00	0.00
Nuclear-Western Region	4496.51	2.62
Import from Self Generating Industries	978.14	0.57
Total	171732.56	100.00
Total generation excluding Low-cost power generation	155734.15	
Generation by Coal out of Total Generation excluding Low-cost power generation	130461.68	83.77
Generation by Diesel out of Total Generation excluding Low-cost power generation	0.00	0.00
Generation by Gas out of Total Generation eexcluding Low-cost power generation	25272.47	16.23
Imports from others		
Imports from NREB	1093.26	
Imports from SREB	1766.61	
Imports from EREB	9094.76	
Estimation of Baseline Emission Factor (tCO_2/MU)		
Simple Operating Margin		
Fuel 1 : Coal		
Avg. Efficiency of power generation with coal as a fuel, %		36.487
Avg. Calorific Value of Coal used (kcal/kg)		3820
Estimated Coal consumption (tons/yr)		80496903
Emission Factor for Coal-IPCC standard value (tonne CO2/TJ)		96.1
Oxidation Factor of Coal-IPCC standard value		0.98
COEF of Coal (tonneCO2/ton of coal)		1.506
Fuel 2 : Diesel		
Avg. Efficiency of power generation with diesel as a fuel, %		41.707
Avg. Calorific Value of Diesel used (kcal/kg)		10186
Estimated Diesel consumption (tons/yr)		0
Emission Factor for Diesel-IPCC standard value (tonne CO2/TJ)		74.1
Oxidation Factor of Diesel-IPCC standard value		0.99
COEF of Diesel (tonneCO2/ton of diesel)		3.129
Fuel 3 : Gas		
Avg. Efficiency of power generation with gas as a fuel, %		45
Avg. Calorific Value of Gas used (kcal/kg)		11942
Estimated Gas consumption (tons/yr)		4044423
Emission Factor for Gas- IPCC standard value(tonne CO2/TJ)		56.1
Oxidation Factor of Gas-IPCC standard value		0.995
COEF of Gas(tonneCO2/ton of gas)		2.791
EF (OM Simple, excluding imports from other grids), tCO2/MU		851.08
EF (NREB), tCO2/MU		730.00
EF (SREB), tCO2/MU		740.00
EF (EREB), tCO2/MU		1180.00
EF (OM Simple), tCO2/MU		866.96
EF (Weighted average of current generation mix)		791.45
Considering 20% of Gross Generation		
Sector	MU	%
Thermal Coal Based-Western Region	21298.88	57.52
Thermal Diesel Based-Western Region	0.00	0.00
Thermal Gas Based-Western Region	9816.20	26.51
Hydro-Western Region	4804.29	12.98
Wind-Western Region	0.00	0.00
Nuclear-Western Region	1106.27	2.99
Import from other Regions	0.00	0.00
Import from Self Generating Industries	0.00	0.00
Total	37025.64	100.00
Generation by Coal out of Total Generation	21298.88	57.52
Generation by Diesel out of Total Generation	0.00	0.00
Generation by Gas out of Total Generation	9816.20	26.51
Built Margin		
Fuel 1 : Coal		
Avg. efficiency of power generation with coal as a fuel, %		36.487
Avg. calorific value of coal used in UPPCL, kcal/kg		3820
Estimated coal consumption, tons/yr		13141742
Emission factor for Coal (IPCC),tonne CO2/TJ		96.1
Oxidation factor of coal (IPCC standard value)		0.98
COEF of coal (tonneCO2/ton of coal)		1.506
Fuel 2 : Diesel		
Avg. Efficiency of power generation with diesel as a fuel, %		41.707

Avg. Calorific Value of Diesel used (kcal/kg)		10186
Estimated Diesel consumption (tons/yr)		0
Emission Factor for Diesel-IPCC standard value (tonne CO2/TJ)		74.1
Oxidation Factor of Diesel-IPCC standard value		0.99
COEF of Diesel (tonneCO2/ton of diesel)		3.129
Fuel 3 : Gas		
Avg. Efficiency of power generation with gas as a fuel, %		45
Avg. Calorific Value of Gas used (kcal/kg)		11942
Estimated Gas consumption (tons/yr)		1570914
Emission Factor for Gas- IPCC standard value(tonne CO2/TJ)		56.1
Oxidation Factor of Gas-IPCC standard value		0.995
COEF of Gas(tonneCO2/ton of gas)		2.791
EF (BM) (tCO2/MU)		**653.06**
Combined Margin Factor (Avg of OM & BM) (tCO2/MU)		**760.01**
Baseline Emissions Factor (tCO2/MU)		**760.01**