Executive Summary

The Tata Power Company Ltd. is a company incorporated under the provisions of the Indian Companies Act, VII of 1913, with its registered office at Bombay House, 24, Homi Mody Street, Fort, Mumbai 400 001. The Company has emerged as a key private player in the Indian power sector with its presence in all business segments of the power sector including the generation business.

- **Power Generation Business in Mumbai Area**

Tata Power owns and operates 2027 MW of capacity in and around Mumbai. The various units of the generation business in and around Mumbai are captured in the table below:

Table 1 : Generating Units of Tata Power in and around Mumbai Area

Generating Unit	Type of Fuel Used	Capacity
Khopoli	Hydro	72
Bhivpuri	Hydro	75
Bhira	Hydro	300
Unit 4	Oil and Gas	150
Unit 5	Coal, oil and Gas	500
Unit 6	Oil and Gas	500
Unit 7	Gas	180
Unit 8	Coal	250
Total		**2027**

The generation capacity of Tata Power -G, during the MYT period is tied up with BEST and Tata Power – D as detailed in the Table below:

Table 2: Power Purchase Agreements of Tata Power – Generation during the Control Period

		BEST		Tata Power - D			
Generating Units	Installed Capacity	Capacity Tied Up	% Share	Capacity Tied Up	Capacity approved in Case No. 76 of 2011	Total	% Share
Thermal Generating Station							
Unit 4	150	68	45.02%	40		40	26.84%
Unit 5	500	256	51.17%	134	110	244	48.83%
Unit 6	500	256	51.17%	134	110	244	48.83%
Unit 7	180	92	51.17%	48	40	88	48.83%
Unit 8	250	100	40.00%	50	100	150	60.00%
Hydro Generating Station							
Hydro	447	229	51.17%	120	98	218	48.83%
Total	2027	1000	49%	527	458	985	49%

In addition, Tata Power has already constructed 40 MW Lodhivli power plant in Raigad District of Maharashtra. This plant is connected to the transmission grid of Tata Power-T and forms a part of the embedded generation for the purpose of addressing the transmission constraints. It is proposed to provide a standby support to Tata Power-D.

- **Past Performance of the Generating Units**

Thermal: The generation performance from the Thermal Generating Units has been closer to or higher than the approved gross generation by the Hon'ble Commission through their Tariff Orders as can be seen from the Table given below:

Table 3: Gross Generation of the Thermal Generating Units for the last 5 Years

Unit	Gross Generation (Mus)									
	FY 2006-07		FY 2007-08		FY 2008-09		FY 2009-10		FY 2010-11	
	Approved	Actual	Approved	Actual	Approved	Actual	Approved	Actual	Approved	Actual
Unit 4	183	890	935	795	573	857	78	47	143	120
Unit 5	4,114	4,027	3,995	4,001	4,317	4,353	3,988	3,480	3,504	3,663
Unit 6	3,023	2,924	3,816	3,870	3,556	3,618	3,877	3,694	3,504	2,268
Unit 7	1,418	1,340	1,440	1,337	1,303	1,004	1,420	1,415	1,261	1,569
Unit 8							1206	1022	951	1256
Total	8738	9181	10186	10003	9749	9832	10569	9658	9363	8876

Hydro: The generation from the Hydro Generating Stations is typically a function of plant availability, the quantum of water available in the catchment areas as well as policies on irrigation and Krishna Water Tribunal Award (KWTA) allocation. While the first factor is a controllable factor, the other factors are not fully predictable. The generation from Hydro for the past five year is shown in the Table below:

Table 4: Gross Hydro Generation for the last five Years

Gross Generation	FY 2006-07		FY 2007-08		FY 2008-09		FY 2009-10		FY 2010-11	
	Approved	Actual	Approved	Actual	Approved	Actual	Approved	Actual	Approved	Actual
Hydro (MUs)	1,501	2,138	1,500	1,489	1,375	1,151	1,492	1,455	1,450	1,310

All the generating units of the Thermal Generating Station at Trombay have maintained a high level of availability over the past few years, higher than the Target Availability of 80%. This has resulted into a reliable power supply to all the Distribution Utilities. The availability of the thermal units in the last few years is as follows:

Table 5: % Availability of the Generating Units at Trombay

Availability (%)	FY 2006-07		FY 2007-08		FY 2008-09		FY 2009-10		FY 2010-11	
	Approved	Actual	Approved	Actual	Approved	Actual	Approved	Actual	Approved	Actual
Thermal										
Unit 4		98%	99%	86%	99%	97%	99%	84%	92%	98%
Unit 5		93%	92%	92%	99%	100%	92%	81%	99%	92%
Unit 6		87%	99%	100%	93%	90%	99%	99%	92%	92%
Unit 7		93%	91%	96%	83%	71%	91%	93%	97%	96%
Unit 8							99%	74%		94%

As can be seen from the above Table, the Availability of all Generating Units has been maintained at high levels over the years with one exception of Unit 7 in FY 2008-09 and Unit 8 in FY 2009-10. While the low availability of Unit 7 (in FY 2008-09) was on account of an extended outage required to be taken for uncontrollable technical reasons, Unit 8 was in a stabilisation period of after COD and had 23 forced outages and 1 planned outage for Performance Guarantee test readiness.

In the case of Hydro Generating Stations, Tata Power has been maintaining a high level of capacity index, much higher than the Target Capacity Index of 85% under the Tariff Regulations. The performance of the Hydro Generating Stations in terms of Capacity Index for the past few years is given in the Table below:

Table 6: Capacity Index of Hydro Generating Stations for the last few Years

Availability (%)	FY 2006-07	FY 2007-08	FY 2008-09	FY 2009-10	FY 2010-11
Khopoli	100%	100%	98%	97%	99%
Bhivpuri	98%	98%	99%	99%	95%
Bhira	98%	99%	94%	99%	97%

- **Business Plan Philosophy**

Tata Power-G has considered initially a bottom-up approach for building up the business plan. This was done while taking into account the plant requirements for sustaining and enhancing the life and efficiency of existing units, replacements envisaged on account of technology obsolescence and other considerations such as enhancement of plant safety and security. The same was further refined with inputs received from the Top management to factor the current and future challenges / constraints. The three major pivots for the proposed business plan are as below:

I. Cost of generation
II. Reliability and Technology Upgradation
III. Current and future constraints

- **Outline of Business Plan**

The Business Plan for FY 2012-16 is broadly classified into the following:

Outage and Availability Plan – provides brief description of the planned maintenance schedule & activities for all the Generating Units of Tata Power.

Generation Plan – Provides the estimated generation during the Control Period.

Operational Performance Plan – gives the performance parameter trajectory of Tata Power Generation units during the Control Period and the plans to sustain and improve the same.

Fuel Procurement Plan for Thermal Generating Station – gives the fuel availability plan as per generation schedule

Addressing Challenges faced by Tata Power – Generation – There are certain key challenges Tata Power faces. These are briefly described in this section along with the mitigation measures proposed.

Capital Expenditure Plan - Gives in detail the proposed capital expenditure and capitalisation plan for the Control Period.

Other Related Plans – These include the Human Resource Plan, Environment Plan, Corporate Social Responsibility Plan, Organisation Plan towards achieving high performance (Sankalp), Energy Conservation Plan & Risk Mitigation Plan.

- **Outage and Availability Plan**

The proposed outage plan for the various Thermal Generating Units of Tata Power during the Control period is shown in the table below:

Table 7: Outage Plan of the Thermal Generating Units during the Control Period

Unit	FY 2011-12	FY 2012-13	FY 2013-14	FY 2014-15	FY 2015-16
Unit 4	Oct, 2011 - Nov, 2011 (45 days) Turbine Overhaul				
Unit 5	Dec, 2011 – Jan, 2012 (35 days) HP-IP-Gen		Jan, 2014 – Feb, 2014 (55 Days) Binary Control System Replacement & Condensor Re-tubing		Dec, 2015 – Jan, 2016 (25 Days) LP
Unit 6	Feb, 2011 (08 days) Boiler SH header inspection	Feb, 2013 (25 days) Capital Overhaul		Dec, 2014 – Mar, 2015 (90 Days) Coal Conversion & HP-LP	
Unit 7	Jul, 2011 - Aug, 2011 (7 Days)	Aug, 2012 (7 Days)	Jul, 2013 - Aug, 2013 (47 Days) Major Overhaul	Aug, 2014 (7 Days)	Aug, 2015 (7 Days)
Unit 8	Jul, 2011 (25 Days) Generator Major Inspection, 8APH PA sector modification	Dec, 2012 - Jan, 2013 (47 Days) Additional coal mill installation & FGD CW work		Jul, 2014 - Aug, 2014 (25 Days) HP-IP-LP	

Based on the above, the Availability of the Thermal Generating Stations during the Control Period is projected as follows:

Table 8: % Availability of the Thermal Generating Stations during the Control Period

	FY 2011-12	FY 2012-13	FY 2013-14	FY 2014-15	FY 2015-16
Unit 4	86.87%	98.00%	98.00%	98.00%	98.00%
Unit 5	86.16%	96.00%	82.00%	96.35%	89.00%
Unit 6	97.05%	92.00%	95.00%	73.57%	87.00%
Unit 7	97.50%	97.00%	86.00%	97.00%	97.00%
Unit 8	85.00%	85.00%	90.00%	88.82%	91.00%

The outage plan for the Hydro Generating Stations is given in the Table below:

Table 9: Outage Plan of the Hydro Generating Units during the Control Period

Unit	FY 2011-12	FY 2012-13	FY 2013-14	FY 2014-15	FY 2015-16
Bhira	Feb, 2012 (10 days) Set # 2 Relay Replacement & Excitation system Rehabilitation		Oct - Dec, 2013 (90 Days) BPSU Rewinding, Excitation System Rehabilitation		May-June'15 (25 days) BPSU Major Overhaul
Bhivpuri	Jul, 2011 & Aug, 2011 (20 days) U # 9 Major Overhaul (14 days) U # 10 Mechanical Overhaul	Jul, 2012 (10 days) U # 11 Mechanical Overhaul		Aug, 2014 (20 days) U # 10 Major Overhaul	Aug, 2015 (10 days) U # 9 Mechanical Overhaul
Khopoli	Jul, 2011 & Dec, 2011 (7 days each) U # 7 & U # 9 SV seal replacement (10 days) U # 9 Mechanical Overhaul	Dec, 2012 (10 days) U # 7 Mechanical Overhaul	Dec, 2013 (10 days) U # 8 Mechanical Overhaul	Dec, 2014 (20 days) U # 9 Mechanical Overhaul	

Considering the above Outage Plans for the Hydro Generating Stations and a forced outage rate of 1 to 3%, the expected availability of the Tata Power Hydro Generating Stations during the Control Period will be as follows:

Table 10 : Availability of Hydro Generating Stations during the Control Period

	FY 2011-12	FY 2012-13	FY 2013-14	FY 2014-15	FY 2015-16
Availability	96.42%	96.50%	90.40%	98.00%	94.90%

As can be seen from the above table, Tata Power-G expects to maintain high availability of all its generating units during the Control Period FY 2011-12 to FY 2015-16.

- **Generation Plan**

To determine the generation plan of the Generating Station, the following are the prerequisites:

- Demand Projections of the Distribution Utilities with whom Tata Power has signed PPAs.
- Availability Projections of the individual Generating Units.
- Position in the Merit Order Despatch of the Contracted Capacities of the Distribution Utilities

Considering all the aspects like availability of the Generating Units, cost of generation, a Merit Order Despatch (MOD), etc. the expected MUs to be generated by each of the

Generating Units of Tata Power and consequently the PLF is arrived at after running the MOD. The same is detailed out in the Table below:

Table 11 : Generation & PLF from Tata Power Generating Units during the Control Period

	Generation					PLF				
Generating Units	FY 2011-12	FY 2012-13	FY 2013-14	FY 2014-15	FY 2015-16	FY 2011-12	FY 2012-13	FY 2013-14	FY 2014-15	FY 2015-16
	MUs	MUs	MUs	MUs	MUs	%	%	%	%	%
Hydro	1,360.00	1,360.00	1,210.00	1,360.00	1,360.00					
Unit 4										
Unit 5	3,634.40	4,134.85	3,548.42	4,169.77	3,884.71	82.75	94.40	81.01	95.20	88.45
Unit 6	1,830.14	1,912.85	2,630.17	2,137.32	3,322.00	41.67	43.67	60.05	48.80	75.64
Unit 7	1,551.49	1,527.01	1,360.19	1,527.01	1,527.01	98.13	96.58	86.03	96.58	96.58
Unit 8	1,511.65	1,710.40	1,927.00	1,850.00	1,926.00	86.05	78.10	87.99	84.47	87.70
Total Trombay	8,527.68	9,285.10	9,465.79	9,684.10	10,659.72					
Tata Power-G	9,887.68	10,645.10	10,675.79	11,044.10	12,019.72					

** - For FY 2011-12, Unit 8 generation is for 150 MW for first 6 months and 250 MW for the remaining 6 months*

- **Operational Performance Plan**

Apart from availability and plant load factor, there are certain key performance parameters of the Generating Units which directly impact the cost of generation. The Hon'ble Commission in the MYT Regulations have set the norms for these Performance Parameters. The expected performance of each of the Generating Units vis a vis the norms set by the Hon'ble Commission has been presented as follows:

150 MW Unit 4 - A 1965 vintage Unit, Unit 4 will be operated as a Standby Unit during the Control Period

Table 12 : Estimated Performance of 500 MW Unit 5 during the Control Period

Performance Parameter		FY 2011-12	FY 2012-13	FY 2013-14	FY 2014-15	FY 2015-16
Availability (%)	*Norm*	*85.00*	*85.00*	*85.00*	*85.00*	*85.00*
	Planned	86.16	96.00	82.00	96.35	89.00
PLF (%)	*Norm*	*85.00*	*85.00*	*85.00*	*85.00*	*85.00*
	Planned	82.75	94.40	81.01	95.20	88.45
Heat Rate (kcal / kWh)	*Norm*	*2575*	*2583*	*2591*	*2573*	*2581*
	Planned	2560	2575	2591	2570	2580
Auxiliary Consumption (%)	*Norm*	*6.00*	*6.00*	*6.00*	*6.00*	*6.00*
	Planned	5.70	5.70	5.90	5.70	5.90

Table 13 : Estimated Performance of 500 MW Unit 6 during the Control Period

Performance Parameter		FY 2011-12	FY 2012-13	FY 2013-14	FY 2014-15	FY 2015-16
Availability (%)	*Norm*	*85.00*	*85.00*	*85.00*	*85.00*	*85.00*
	Planned	97.05	92.00	95.00	73.57	87.00
PLF (%)	*Norm*	*85.00*	*85.00*	*85.00*	*85.00*	*85.00*
	Planned	41.67	43.67	60.05	48.80	75.64
Heat Rate (kcal / kWh)	*Proposed Norm*	*2700*	*2700*	*2700*	*2700*	*2700*
	Norm	*2519*	*2524*	*2529*	*2534*	*2539*
	Planned	2691	2735	2700	2705	2581
Auxiliary Consumption (%)	*Proposed Norm*	*6.50*	*6.50*	*6.50*	*6.50*	*6.50*
	Norm	*6.00*	*6.00*	*6.00*	*6.00*	*6.00*
	Planned	5.40	5.30	5.10	5.20	6.15

Table 14 : Estimated Performance of 180 MW Unit 7 during the Control Period

Performance Parameter		FY 2011-12	FY 2012-13	FY 2013-14	FY 2014-15	FY 2015-16
Availability (%)	*Norm*	*85.00*	*85.00*	*85.00*	*85.00*	*85.00*
	Planned	97.50	97.00	86.00	97.00	97.00
PLF (%)	*Norm*	*85.00*	*85.00*	*85.00*	*85.00*	*85.00*
	Planned	98.13	96.58	86.03	96.58	96.58
Heat Rate (kcal / kWh)	*Norm*	*2009*	*2013*	*2017*	*2021*	*2025*
	Planned	1991	1995	1985	1990	1990
Auxiliary Consumption (%)	*Norm*	*3.00*	*3.00*	*3.00*	*3.00*	*3.00*
	Planned	2.50	2.60	2.75	2.60	2.60

Table 15 : Estimated Performance of 250 MW Unit 8 during the Control Period

Performance Parameter		FY 2011-12*	FY 2012-13	FY 2013-14	FY 2014-15	FY 2015-16
Availability (%)	*Norm*	*85.00*	*85.00*	*85.00*	*85.00*	*85.00*
	Planned	85.00	85.00	90.00	88.82	91.00
PLF (%)*	*Norm*	*85.00*	*85.00*	*85.00*	*85.00*	*85.00*
	Planned	86.05	78.10	87.99	84.47	87.70
Heat Rate (kcal / kWh)	*Norm*	*2450*	*2450*	*2450*	*2450*	*2450*
	Planned	2390	2420	2400	2420	2399
Auxiliary Consumption (%)**	*Norm*	*8.50*	*8.50*	*8.50*	*8.50*	*8.50*
	Planned	7.32	7.70	7.60	7.70	7.50

** - For FY 2011-12, PLF considering 150 MW for first 6 months and 250 MW for remaining 6 months*

*** - % Auxiliary Consumption is excluding FGD consumption*

- **Capital Expenditure Plan**

Trombay Generating Station being a very old generating station, investments are required to sustain the performance and reliability of plant and to enhance the life of the plant to a limited extent.

There are certain other aspects which require capital investment plan as follows:

i. Statutory compliances – Ash Pond, Ash silo, Coal pile run off, pollution monitoring equipments, safety & security related schemes, etc.
ii. Fuel logistics / securitization.
iii. Insurance Spares

iv. Technology up gradation or new technology to help enhance performance

The Hydro Generating Stations have similar areas of requirement as that of Thermal; the major among them being restacking and rewinding of the BPSU generator and replacement of one 25 MW Unit at Bhira. In addition there are certain capital investments planned to the water system from the point of view of safety and statutory requirements.

The major capital expenditure schemes proposed have been described in **Annexures 4 and 5**. The summary of the capital expenditure and capitalisation planned for Unit 4 to Unit 7, Hydros and Unit 8 during the Control Period is given in the Tables below:

Table 16: Capitalisation during the Control Period (Unit 4 to 7)

MERC Approval Status	Capital Expenditure (Rs Crs)					Capitalisation (Rs Crs)				
	FY 2011-12	FY 2012-13	FY 2013-14	FY 2014-15	FY 2015-16	FY 2011-12	FY 2012-13	FY 2013-14	FY 2014-15	FY 2015-16
Approved										
DPR	98.10	90.74	53.75	5.71	4.36	76.13	99.69	83.68	18.81	5.36
Submitted but yet to be approved										
DPR	5.87	29.26	0.85	8.35	-	3.33	29.72	2.64	7.65	1.00
To be Submitted										
DPR	10.67	18.91	372.23	1,100.93	74.99	10.92	16.60	363.46	71.40	1,113.54
Approval Not Required										
Non-DPR	8.90	4.13	4.11	7.29	1.85	5.74	4.31	4.43	7.29	1.85
HO/SS	2.24	2.24	2.24	2.24	2.24	2.24	2.24	2.24	2.24	2.24
TOTAL	125.78	145.28	433.18	1,124.52	83.44	98.35	152.56	456.45	107.38	1,123.99

Table 17: Capitalisation during the Control Period (Hydro)

MERC Approval Status	Capital Expenditure (Rs Crs)					Capitalisation (Rs Crs)				
	FY 2011-12	FY 2012-13	FY 2013-14	FY 2014-15	FY 2015-16	FY 2011-12	FY 2012-13	FY 2013-14	FY 2014-15	FY 2015-16
Approved										
DPR	64.67	153.42	41.76	11.34	7.05	45.99	94.10	120.83	11.34	7.05
Submitted but yet to be approved										
DPR	4.61	12.36	3.98	3.67	7.45	4.97	6.36	9.98	3.62	7.90
To be Submitted										
DPR	0.45	1.55	6.52	59.79	56.52	0.20	0.80	6.00	6.52	111.31
Approval Not Required										
Non-DPR	9.68	1.70	3.01	0.78	1.66	9.24	2.45	3.01	0.78	1.66
HO/SS	1.43	1.43	1.43	1.43	1.43	1.43	1.43	1.43	1.43	1.43
TOTAL	80.85	170.46	56.71	77.01	74.11	61.83	105.15	141.25	23.69	129.35

Table 18: Capitalisation during the Control Period (Unit 8)

MERC Approval Status	Capital Expenditure (Rs Crs)					Capitalisation (Rs Crs)				
	FY 2011-12	FY 2012-13	FY 2013-14	FY 2014-15	FY 2015-16	FY 2011-12	FY 2012-13	FY 2013-14	FY 2014-15	FY 2015-16
Approved										
DPR	40.27	32.36	23.08	2.37	1.39	25.92	26.62	45.18	2.37	1.39
Submitted but yet to be approved										
DPR	2.83	3.52	0.33	-	-	1.49	3.62	1.56	-	-
To be Submitted										
DPR	5.66	22.71	4.28	21.51	23.67	5.39	22.72	2.52	16.97	30.22
Approval Not Required										
Non-DPR	5.16	2.31	1.52	2.26	1.10	3.29	2.41	1.72	2.26	1.10
HO/SS	1.33	1.33	1.33	1.33	1.33	1.33	1.33	1.33	1.33	1.33
TOTAL	55.25	62.23	30.54	27.47	27.48	37.42	56.70	52.30	22.93	34.03

- **Total Fixed Charges for Unit 4 to Unit 7 and Hydros**

The Total Fixed Charges estimated for Unit 4 to Unit 7 and Hydro are given in the tables below.

Table 19: Total Fixed Charges of Tata Power –G (Unit 4 to Unit 7 and Hydros)

Rs. Crore

	FY 2011-12	FY 2012-13	FY 2013-14	FY 2014-15	FY 2015-16
RoE	200.27	207.72	219.46	246.75	252.38
Depreciation	108.55	107.87	129.22	146.85	177.93
O&M	398.72	435.16	460.06	486.37	514.19
Interest on LT Loans	65.13	71.01	91.61	104.73	140.32
Interest on Working Capital	103.25	110.70	114.61	116.81	79.52
Less Other Income	-15.67	-15.67	-15.67	-15.67	-15.67
Total Fixed Charges	**860.25**	**916.80**	**999.29**	**1085.84**	**1148.68**
Income Tax	64.46	59.24	54.90	83.07	63.13
Total Annual Fixed Charges	**924.71**	**976.04**	**1054.19**	**1168.91**	**1211.81**
Less Share of Unit 8 from Shared Service	-12.50	-12.50	-12.50	-12.50	-12.50
Total Fixed Charges to be recovered from Distribution Licensees	**912.21**	**963.54**	**1041.69**	**1156.41**	**1199.31**

- **Total Fixed Charges for Unit 8**

The Annual Fixed Charges have been worked out for 250 MW. Considering these charges, the Annual Fixed Charges for 150 MW has been computed in proportion to the capacity for the year FY 2011-12 since, for the year FY 2011-12, PPA for 100 MW between Tata Power-G and Tata Power-D is not operational. Further, the allocation of shared services has been considered on the basis of the Tariff Order dated 8th September 2010 for Tata Power –G. The computation of the Annual Fixed Charges for 250 MW Unit 8 is as follows:

Table 20: Total Fixed Charges of Tata Power –G (Unit 8)

Rs. Crore

	FY 2011-12	FY 2012-13	FY 2013-14	FY 2014-15	FY 2015-16
RoE	49.14	50.88	53.51	55.94	57.01
Depreciation	57.30	59.82	62.68	64.66	65.88
O&M	37.03	39.15	41.38	43.75	46.25
Interest on LT Loans	74.86	72.11	69.94	66.03	61.21
Interest on Working Capital	24.79	26.69	25.62	25.79	25.86
Total Annual Fixed Charges	243.12	248.65	253.12	256.18	256.20
Income Tax	12.29	12.73	13.39	13.99	14.26
Total Fixed Charges including Income Tax	**255.41**	**261.38**	**266.51**	**270.17**	**270.46**
Regulated Capacity (MW)*	200.00	250.00	250.00	250.00	250.00
Share of Total for Regulated Cap	204.33	261.38	266.51	270.17	270.46
Add Cost of Shared Services	10.00	12.50	12.50	12.50	12.50
Total Fixed Charges to be recovered from Distribution Licensees	**214.33**	**273.88**	**279.01**	**282.67**	**282.96**

** Capacity for FY 2011-12 considered as an average of H1 - 150 MW and H2 - 250 MW*

- **Energy Charges for the Thermal Units**

The Energy Charges (Rs. / kwh) for various thermal units using various fuels works out to as follows:

Table 21 : Energy Charges (Rs/ kwh) for Trombay Units

Unit		FY 2011-12	FY 2012-13	FY 2013-14	FY 2014-15	Rs/Kwh FY 2015-16
Unit 5	Oil	10.11	10.28	10.37	10.30	10.33
Unit 5	Coal	3.10	3.42	3.20	3.17	3.18
Unit 5	Gas	2.63	2.60	2.53	2.51	2.52
Unit 5	RLNG	5.19	6.47	7.68	7.62	7.65
Unit 6	Gas	2.78	2.74	2.65	2.65	2.65
Unit 6	RLNG	5.48	6.80	8.04	8.04	8.04
Unit 6	Oil	10.66	10.80	10.87	10.87	10.87
Unit 6	Coal					3.35
Unit 7	Gas	1.99	1.97	1.91	1.91	1.92
Unit 7	RLNG	3.93	4.89	5.79	5.80	5.81
Unit 8	Coal	3.02	3.32	3.09	3.09	3.09
Unit 8	Sec Oil	0.05	0.05	0.05	0.05	0.05

Based on the above computations of the Energy Charge (Rs/ kwh) and the estimated generation presented earlier, the total Energy Cost (Rs Cr) for the Control Period is projected as given in the table below

Table 22 : Energy Cost (Rs Cr) for Trombay Units

Unit	Fuel	FY 2011-12			FY 2012-13			FY 2013-14			FY 2014-15			FY 2015-16		
		Rs/Kwh	Net Gen (Mus)	Rs Cr	Rs/Kwh	Net Gen (Mus)	Rs Cr	Rs/Kwh	Net Gen (Mus)	Rs Cr	Rs/Kwh	Net Gen (Mus)	Rs Cr	Rs/Kwh	Net Gen (Mus)	Rs Cr
Unit 5	Oil	10.11	33.35	33.73	10.28	21.09	21.68	10.37	18.81	19.51	10.30	20.71	21.33	10.33	19.52	20.17
Unit 5	Coal	3.10	3,358.14	1,041.96	3.42	3,857.80	1,319.77	3.20	3,185.32	1,017.94	3.17	3,831.08	1,234.84	3.18	3,615.85	1,151.06
Unit 5	Gas	2.63	35.73	9.41	2.60	20.27	5.28	2.53	134.96	34.15	2.51	20.31	5.10	2.52	20.18	5.09
Unit 5	RLNG	5.19	-	-	6.47	-	-	7.68	-	-	7.62	-	-	7.65	-	-
Unit 6	Gas	2.78	3.82	1.06	2.74	-	-	2.65	-	-	2.65	-	-	2.65	-	-
Unit 6	RLNG	5.48	1,130.63	619.11	6.80	1,369.20	930.75	8.04	2,247.65	1,807.35	8.04	1,823.56	1,466.34	8.04	-	-
Unit 6	Oil	10.66	596.91	636.34	10.80	442.24	477.81	10.87	249.74	271.40	10.87	202.62	220.19	10.87	12.66	13.76
Unit 6	Coal	-	-	-	-	-	-	-	-	-	-	-	-	3.35	3,104.62	1,039.42
Unit 7	Gas	1.99	1,406.41	280.08	1.97	1,381.37	271.61	1.91	1,231.45	235.07	1.91	1,385.39	264.98	1.92	1,388.69	266.14
Unit 7	RLNG	3.93	106.24	41.72	4.89	105.93	51.75	5.79	91.36	52.90	5.80	101.90	59.12	5.81	98.58	57.31
Unit 8	Coal & Sec Oil	3.07	1,401.21	429.53	3.37	1,578.75	531.30	3.14	1,780.95	558.78	3.14	1,707.47	535.72	3.14	1,781.55	558.96
Total		3.83	8,072.45	3,092.94	4.11	8,776.65	3,609.94	4.47	8,940.24	3,997.10	4.16	9,153.03	3,807.63	3.10	10,041.65	3,111.90

- **Incentive on Hydro Generation**

For the purpose of computation of Energy Charge Rate, the Annual Fixed Cost for Hydro Generating Station has been considered as a percentage equal to that of the percentage share of Hydro in the approved Annual Fixed Cost for FY 2010-11 in the Tariff Order dated 8th September 2010. The Energy Charge Rate works out to as given in the Table below:

Table 23: Computation of Energy Charge Rate

		FY 2011-12	FY 2012-13	FY 2013-14	FY 2014-15	FY 2015-16
Annual Fixed Charges	Rs. Crore	260.27	273.04	296.58	337.16	372.65
DE x (1-Aux Con)	MUs	1049.28	1049.28	1049.28	1049.28	1049.28
Energy Charge Rate (ECR)	Rs/Kwh	1.24	1.30	1.41	1.61	1.78

We have then computed the Energy Charges for the proposed generation. As the generation at Design Energy entitles a hydro station for recovery of its fixed costs, the difference between the Energy Charges and the Annual Fixed Charges has been considered as an incentive. The computations are as given in the table below

Table 24: Incentive on Hydro Generation

		FY 2011-12	FY 2012-13	FY 2013-14	FY 2014-15	FY 2015-16
Annual Fixed Charges (a)*	Rs. Crore	260.27	273.04	296.58	337.16	372.65
Normative Availability	%	90.00%	90.00%	90.00%	90.00%	90.00%
Projected Availability	%	96.42%	96.50%	90.40%	98.00%	94.90%
Recovery of Annual Fixed Charges as per Regulation 50.2 (b)	Rs. Crore	139.42	146.38	148.95	183.56	196.47
DE x (1-Aux Con) (c)	Mus	1,049.28	1,049.28	1,049.28	1,049.28	1,049.28
Energy Charge Rate (ECR) (d)	Rs/Kwh	1.24	1.30	1.41	1.61	1.78
Computation of Incentive		**FY 2011-12**	**FY 2012-13**	**FY 2013-14**	**FY 2014-15**	**FY 2015-16**
Net Energy Projected (e)	Mus	1305.60	1305.60	1161.60	1305.60	1305.60
Energy Charge [(f) = d*e/10]	Rs. Crore	161.92	169.87	164.16	209.76	231.84
Total [(g) = b+f]	Rs. Crore	301.34	316.25	313.11	393.33	428.31
Incentive - [g-a]	Rs. Crore	41.07	43.21	16.53	56.17	55.66

* As Fixed charges are worked out for TPC-G as a whole , the AFC for Hydro presented on the present share in the AFC

- **Incentive on Thermal Generation**

Based on the generation projections, the Incentive is worked out as given in the table below

Table 25: Incentive for Trombay Generation

	FY 2011-12	FY 2012-13	FY 2013-14	FY 2014-15	FY 2015-16
Net Generation (MUs)					
Unit 5	3427.22	3899.16	3339.09	3932.09	3655.55
Unit 6	1731.36	1811.44	2497.39	2026.18	3117.28
Unit 7	1512.65	1487.30	1322.81	1487.29	1487.27
Unit 8	1401.21	1578.75	1780.95	1707.47	1781.55
Incentive Calculations (Rs. Crore)					
Unit 5	0.00	9.99	0.00	10.81	3.66
Unit 6	0.00	0.00	0.00	0.00	0.00
Unit 7	5.23	4.68	0.57	4.68	4.59
Total	5.23	14.67	0.57	15.49	8.25
Unit 8	0.87	0.00	1.94	0.10	1.84

- **Summary of Generation Cost of Tata Power**

After considering the above computations, generation cost of Tata Power –G has been worked out and presented in the table given below

Table 26 : Summary of Cost of Generation

		FY 2011-12	FY 2012-13	FY 2013-14	FY 2014-15	FY 2015-16
Fixed Charges						
Fixed Charges (Unit 4 to 7 and Hydro)	Rs Cr	912.21	963.54	1,041.69	1,156.41	1,199.31
Fixed Charges (Unit 8)	Rs Cr	214.33	273.88	279.01	282.67	282.96
Total Fixed Charges	Rs Cr	1,126.54	1,237.42	1,320.70	1,439.09	1,482.28
Energy Charges						
Unit 4 to 7 and Hydro	Rs Cr	2,663.41	3,078.64	3,438.32	3,271.91	2,552.94
Unit 8	Rs Cr	429.53	531.30	558.78	535.72	558.96
Total Energy Charges	Rs Cr	3,092.94	3,609.94	3,997.10	3,807.63	3,111.90
Incentive						
Unit 4 to 7	Rs Cr	5.23	14.67	0.57	15.49	8.25
Unit 8	Rs Cr	0.87	-	1.94	0.10	1.84
Hydro G	Rs Cr	41.07	43.21	16.53	56.17	55.66
Total Incentive	Rs Cr	47.17	57.88	19.04	71.76	65.75
Total Cost of Generation	Rs Cr	4,266.65	4,905.24	5,336.84	5,318.48	4,659.93
Quantum of Net Generation	Mus	9,378.05	10,082.25	10,101.84	10,458.63	11,347.25
Avg Cost of Net Generation	Rs/Kwh	4.55	4.87	5.28	5.09	4.11

- **Projections for Lodhivli**

The 40 MW Lodhivli Generating Station, an embedded generation capacity will be commissioned in FY 2011-12. As explained earlier, Tata Power-D will be contracting this capacity as standby capacity during the Control Period. This chapter discusses the fixed cost projections for the Control Period. The calculations have been done considering the Maharashtra Electricity Regulatory Commission (MYT) Regulation 2011 ("Tariff Regulations") of the Hon'ble Commission.

a. Capitalisation during the Control Period

The capitalization during the control period for the Lodhivli Generating Station is presented below:

Table 27: Capitalisation during the Control Period

	Capital Expenditure (Rs Crs)					Capitalisation (Rs Crs)				
	FY 2011-12	FY 2012-13	FY 2013-14	FY 2014-15	FY 2015-16	FY 2011-12	FY 2012-13	FY 2013-14	FY 2014-15	FY 2015-16
	80.70	-	-	-	-	80.70	-	-	-	-
TOTAL	80.70	-	-	-	-	80.70	-	-	-	-

b. Annual Fixed Charges of Lodhivli

Considering the components of Annual Fixed Charges as per the MERC (Multi Year Tariff) Regulations 2011 ("Tariff Regulations") the total fixed cost for the Lodhivli Generating Station for the Control Period works out as follows:

Table 28: Annual Fixed Charges of Lodhivli

Rs. Crore

	FY 2011-12	FY 2012-13	FY 2013-14	FY 2014-15	FY 2015-16
RoE	1.88	3.75	3.75	3.75	3.75
Depreciation	2.13	4.26	4.26	4.26	4.26
O&M	5.39	5.70	6.02	6.37	6.73
Interest on LT Loans	2.99	5.75	5.28	4.81	4.34
Interest on Working Capital	0.46	0.63	0.63	0.64	0.64
Income Tax	0.47	0.94	0.94	0.94	0.94
Total Fixed Charges for Lodhivli	**13.31**	**21.03**	**20.89**	**20.76**	**20.66**