

GUJARAT ELECTRICITY REGULATORY COMMISSION



Tariff Order

Truing up for 2015-16,
Determination of Final ARR for FY 2016-17,
Approval of Muti-Year ARR for FY 2016-17 to FY 2020-21
and Determination of Tariff for FY 2017-18

For

**Gujarat State Electricity Corporation Limited
(GSECL)**

Case No. 1619 of 2016

31st March, 2017

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**GUJARAT ELECTRICITY REGULATORY COMMISSION
(GERC)**

GANDHINAGAR

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For

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ABBREVIATIONS

ABT	Availability Based Tariff
Act	Electricity Act, 2003
AOH	Annual Overhauling
APR	Annual Performance Review
ARR	Aggregate Revenue Requirement
CEA	Central Electricity Authority
CERC	Central Electricity Regulatory Commission
COH	Capital Overhauling
CUF	Capacity Utilization Factor
CV	Calorific Value
DISCOMs	Distribution Companies
ESP	Electro static precipitator
FPPPA	Fuel and Power Purchase Price Adjustment
FY	Financial Year
GCV	Gross Calorific Value
GEB	Gujarat Electricity Board
GERC	Gujarat Electricity Regulatory Commission
GETCO	Gujarat Energy Transmission Corporation Limited
GFA	Gross Fixed Assets
GoG	Government of Gujarat
GSECL	Gujarat State Electricity Corporation Limited
GUVNL	Gujarat Urja Vikas Nigam Limited
HSD	High Speed Diesel
IPP	Independent power producer
K.Cal	Kilo Calorie
KV	Kilo Volt
kWh	Kilo Watt Hour
LSHS	Low Sulphur Heavy Stock
MW	Mega Watt
MYT	Multi-Year Tariff
NCV	Net Calorific Value
O&M	Operations & Maintenance
OEM	Original Equipment Manufacturer
OPEC	Organization of Petroleum Exporting Countries
PAF	Plant Availability Factor
PG test	Performance Guarantee Test
PLF	Plant Load Factor
R & M	Renovation & Modernization
R E	Revised Estimates
ROE	Return on Equity
RSD	Re-start Duration
Scm	Standard cubic meter
SHR	Station Heat Rate
SLDC	State Load Despatch Centre
Wt. Av.	Weighted Average





Before the Gujarat Electricity Regulatory Commission at Gandhinagar

Case No. 1619 of 2016

Date of the Order: 31.03.2017

CORAM

Shri Anand Kumar, Chairman

Shri K. M Shringarpure, Member

Shri P. J. Thakkar, Member

ORDER

1 Background and Brief History

1.1 Background

Gujarat State Electricity Corporation Limited (hereinafter referred to as “GSECL” or the “Petitioner”) has on 30th November, 2016 filed a petition under Section 62 of the Electricity Act, 2003, read with Gujarat Electricity Regulatory Commission (Multi-Year Tariff) Regulations, 2011, for the Truing up of FY 2015-16 and Gujarat Electricity Regulatory Commission (Multi-Year Tariff) Regulations, 2016 for determination of final ARR for FY 2016-17, determination of ARR for the Control Period i.e. FY 2016-17 to FY 2020-21, and determination of tariff for FY 2017-18.

Gujarat Electricity Regulatory Commission notified the GERC (Multi-Year Tariff) Regulations, 2016 on 29th March, 2016 which is applicable for determination of tariff in all cases covered under the Regulations from 1st April, 2016 onwards. Regulations 17.2 of the GERC (Multi-Year Tariff) Regulations, 2016 provides for submission of detailed Multi-Year Tariff application that comprises truing up for FY 2015-16 to be carried out under GERC (Multi-Year Tariff) Regulations, 2011, Multi-Year Aggregate



Revenue Requirement for the entire Control Period with year-wise details, Revenue from the sale of power at existing tariffs and charges and projected revenue gap or revenue surplus, for the second year of the Control Period under these Regulations, viz., FY 2017-18 and application for determination of final ARR for FY 2016-17 and determination of tariff for FY 2017-18. The Commission shall determine Aggregate Revenue Requirement for the entire Control period and the tariff for the second year of the Control Period for the Generating Company, Transmission Licensee, SLDC, Distribution Wires Business and Retail Supply Business.

After technical validation of the petition, it was registered on 3rd December, 2016 and as provided under Regulation 29.1 of GERC (MYT) Regulations, 2016, the Commission has proceeded with this tariff order.

1.2 Gujarat State Electricity Corporation Limited (GSECL)

Government of Gujarat unbundled and restructured Gujarat Electricity Board with effect from 1st April, 2005. The Generation, Transmission and Distribution businesses of the erstwhile Gujarat Electricity Board were transferred to seven successor companies as listed below:

- Gujarat State Electricity Corporation Limited (GSECL) – A Generation Company
- Gujarat Energy Transmission Corporation Limited (GETCO) – A Transmission Company

Four Distribution Companies:

- Dakshin Gujarat Vij Company Limited (DGVCL)
- Madhya Gujarat Vij Company Limited (MGVCL)
- Uttar Gujarat Vij Company Limited (UGVCL)
- Paschim Gujarat Vij Company Limited (PGVCL) and
- Gujarat Urja Vikas Nigam Limited (GUVNL) – A Holding Company and also responsible for purchase of electricity from various sources and supply to Distribution Companies.

The Government of Gujarat vide Notification dated 3rd October, 2006 notified the final opening balance sheets of the transferee companies as on 1st April, 2005, containing the value of assets and liabilities, which stand transferred from the erstwhile Gujarat Electricity Board to the transferee companies including Gujarat State Electricity



Corporation Limited (GSECL). Assets and liabilities (gross block, loans and equity) as on the date mentioned in the notification have been considered by the Commission in line with the Financial Restructuring Plan (FRP) as approved by Government of Gujarat.

1.3 Commission's orders for the Second Control Period

Gujarat State Electricity Corporation Limited filed its petition under the Multi-Year Tariff framework for the control period FY 2011-12 to FY 2015-16, on 30th December, 2010 in accordance with the Gujarat Electricity Regulatory Commission (Multi-Year Tariff Framework) Regulations, 2007 notified by GERC. However, the Commission issued new MYT Regulations notified as the GERC (Multi-Year Tariff), 2011 on 22nd March, 2011.

As per Regulation 1.4 (a) of the GERC (Multi-Year Tariff) Regulations, 2011, which reads as: "These Regulations shall be applicable for determination of tariff in all cases covered under these Regulations from 1st April, 2011 and onwards." the Commission considered the petition as per the new Regulations.

The Commission, in exercise of the powers vested in it under Sections 61, 62 and 64 of the Electricity Act 2003 and all other powers enabling it in this behalf and after taking into consideration the submissions made by GSECL, the objections by various stakeholders, response of GSECL, issues raised during the public hearing and all other relevant material, issued the Multi-Year Tariff order on 11th April, 2011 for the control period comprising FY 2011-12, FY 2012-13, FY 2013-14, FY 2014-15 and FY 2015-16 based on the GERC (MYT) Regulations, 2011.

The Commission issued the orders for truing up for FY 2010-11 and determination of Tariff for FY 2012-13 on 2nd June, 2012.

The Commission issued the orders for truing up for FY 2011-12 and determination of Tariff for FY 2013-14 on 30th March, 2013.

The Commission issued the order for Truing up for FY 2012-13 and determination of Tariff for FY 2014-15 on 29th April, 2014.

The Commission issued the order for Truing up for FY 2013-14 and determination of Tariff for FY 2015-16 on 31st March, 2015.

The Commission in its order dated 2nd December, 2015, in the Suo Motu Petition No. 1534/2015 decided that the approved ARR of FY 2015-16 of the licensees / generating



companies concerned be considered as provisional ARR of the licensees / generating companies for FY 2016-17. The Commission also decided that the licensees / generating companies shall file the ARR for FY 2016-17 based on the GERC (MYT) Regulations, 2016 for FY 2016-17 to FY 2020-21 and the true-up for the same shall also be governed as per the new MYT Regulations. It was also decided that the licensees / generating companies shall file the petition for determination of ARR and tariff for FY 2016-17 and true-up for FY 2014-15 within 3 weeks from the date of issuance of this order for Commission's consideration and decision.

Accordingly, the petitioner filed its petition for Truing up of FY 2014-15 and determination of tariff for FY 2016-17 on 8th December, 2015. The petition was registered on 17th December, 2015. The Commission approved the provisional ARR vide order dated 31st March, 2016, and the tariff for FY 2016-17 was determined accordingly.

1.4 Background of the Current Petition

As mentioned in para 1.3, the ARR for FY 2016-17 was decided on provisional basis and as stipulated in the GERC (MYT) Regulations, 2016, the final ARR for FY 2016-17 is calculated as per current Regulations.

GSECL has accordingly filed the Petition for true-up for FY 2015-16, determination of final ARR for FY 2016-17, approval of Aggregate Revenue Requirement for the MYT control period FY 2016-17 to 2020-21 and Tariff for FY 2017-18.

1.5 Registration of the Current Petition and Public Hearing Process

The Petitioner submitted the current Petition for Truing-up of FY 2015-16, Aggregate Revenue Requirement for FY 2016-17 to FY 2020-21, Determination of Final ARR for FY 2016-17 & Determination of Tariff for FY 2017-18 on 30th November, 2016. The the above Petition (Case No. 1619 of 2016) was registered on 3rd December, 2016.

In accordance with Section 64 of the Electricity Act, 2003, GSECL was directed to publish its application in the abridged form to ensure public participation.

The Public Notice, inviting objections / suggestions from its stakeholders on the ARR petition filed by GSECL, was published in the following newspapers:



Table 1.1: List of Newspapers

Sr. No.	Name of the Newspaper	Language	Date of publication
1	The Indian Express	English	08/12/2016
2	Gujarat Samachar	Gujarati	08/12/2016

The petitioner also placed the public notice and the petition on its website (www.gsecl.in) for inviting objections and suggestions. The interested parties/stakeholders were asked to file their objections / suggestions on the petition on or before 7th January, 2017.

The Commission received objections / suggestions from consumers / consumer organizations as shown in the Table below. The Commission examined the objections / suggestions received from the stakeholders and fixed the date for public hearing for the petition on 8th February, 2017 at the Commission's Gandhinagar Office, and subsequently a communication was sent to the objectors to take part in the public hearing process for presenting their views in person before the Commission.

The status of stakeholders who submitted their written suggestion / objections, those who remained present in public hearing, those who could not attend the public hearings, and those who made oral submissions is given in the Table below:

Table 1.2: List of Stakeholders

Sr. No.	Name of Stakeholders	Written Submission	Oral Submission	Present on 08.02.2017
1.	H.J. Patel	Yes	No	No
2.	K.K. Bajaj	Yes	Yes	Yes
3.	Gujarat Urja Vikas Nigam Limited (GUVNL)	Yes	Yes	Yes
4.	Federation of Gujarat Industries (FGI)	Yes	Yes	Yes
5.	Utility Users' Welfare Association (UUWA)	Yes	Yes	Yes
6.	Jan Kalyan Foundation	Yes	No	No

The issues raised by the objectors and the Commission's views on the response are dealt with in the chapter 3 of this order.

1.6 Contents of this Order

This order is divided into seven chapters as under:



1. The **First Chapter** provides a background of the petitioner, the petition and details of the public hearing process and the approach adopted for this order.
2. The **Second Chapter** outlines the summary of GSECL's MYT petition.
3. The **Third Chapter** provides a brief account of the public hearing process, including the objections raised by various stakeholders, GSECL's response and the Commission's views on the response.
4. The **Fourth Chapter** deals with the 'Truing up' for FY 2015-16.
5. The **Fifth Chapter** deals with the performance of the Generating Stations for the control period FY 2016-17 to FY 2020-21.
6. The **Sixth Chapter** deals with the Aggregate Revenue Requirement (ARR) for the control period of FY 2016-17 to FY 2020-21.
7. The **Seventh Chapter** deals with the compliance of directives.

1.7 Approach of this Order

The GERC (Multi-Year Tariff) Regulations, 2011 provide for "Truing up" of the previous year and determination of tariff for the ensuing year. The GERC (Multi-Year Tariff) Regulations, 2016 provide for projections for the MYT control period FY 2016-17 to 2020-21. The Commission had approved the ARR for the five years of the control period FY 2011-12 to FY 2015-16 in the MYT order dated 11th April, 2011.

The Commission, vide order dated 2nd December, 2015 in suo-motu Petition No. 1534/2015 decided to consider approved ARR of FY 2015-16 in the MYT order dated 11th April, 2011 as provisional ARR for FY 2016-17 for determination of tariff for FY 2016-17 in view of delay in finalization of GERC (Multi-Year Tariff) Regulations for the third Control Period i.e. FY 2016-17 to FY 2020-21. It was also decided in the said order that Generating Companies, Transmission Licensees and Distribution Companies shall file final ARR for FY 2016-17 based on the new GERC (Multi-Year Tariff) Regulations, 2016 and truing up of the same shall be governed in accordance with new GERC (Multi-Year Tariff) Regulations, 2016.

The GERC (Multi-Year Tariff) Regulations, 2016 provides for determination of ARR for the third Control Period i.e. FY 2016-17 to FY 2020-21 and determination of tariff for FY 2017-18.

GSECL has approached the Commission with the present petition for for "Truing up" of the FY 2015-16, determination of final ARR for FY 2016-17, determination of ARR for



the third control period i.e. FY 2016-17 to FY 2020-21 and determination of tariff for the FY 2017-18.

In this Order, the Commission has considered the “Truing up” for the FY 2015-16, as per GERC (MYT) Regulations, 2011.

The Commission has undertaken “Truing up” for the FY 2015-16, based on the submissions of the Petitioner. The Commission has undertaken the computation of gains and losses for the FY 2015-16, based on the audited annual accounts.

While “Truing up” of FY 2015-16, the Commission has been primarily guided by the following principles:

1. Controllable parameters have been considered at the level approved under the MYT order, unless the Commission considers that there are valid reasons for revision of the same.
2. Uncontrollable parameters have been revised based on the actual performance observed.

The Approval of Final ARR for FY 2016-17, Approval of Multi-Year ARR for FY 2016-17 to FY 2020-21, and Determination of Tariff for FY 2017-18 have been considered as per the GERC (Multi-Year Tariff) Regulations, 2016 and its amendment thereof as the base.

The Commission has considered final fixed Charges for Ukai-6 Station as per Order dated 10th February, 2016 on Petition No.1508 of 2015. For new generating Stations namely Sikka 3 & 4 and Dhuvaran CCPP3, the Commission considered provisionally approved fixed charges vide Tariff Order dated 31st March, 2015.



2 Summary of GSECL Tariff Petition

2.1 Summary of GSECL's Petition

This section highlights the summary of the Petition for True-Up for FY 2015-16, Multi-Year Aggregate Revenue Requirement for FY 2016-17 to FY 2020-21, Determination of Final ARR for FY 2016-17 and Determination of Tariff for FY 2017-18.

2.2 True-Up of FY 2015-16

GSECL has worked out its Aggregate Revenue Requirement (ARR) for FY 2015-16 as a part of the True-Up for FY 2015-16. GSECL has presented the actual cost components based on audited annual accounts for FY 2015-16.

Tables below summarize the results of the True-up of FY 2015-16 of GSECL Stations. For the purpose of True-Up, GSECL compared the actual cost for FY 2015-16 with the cost approved by the Commission in "Tariff Order dated 11th April, 2011 for Truing up of FY 2015-16. For new generating Station namely Ukai-6, Sikka 3-4 & Dhuvaran CCPP3, the approved values as per the Commission's "True-up order for FY 2013-14 & Tariff determination for FY 2015-16 dated 31st March, 2015 & order on Petition No. 1508 of 2015 dated 10th February, 2016 (For Ukai-6) are considered by GSECL.

The fixed cost of GSECL as submitted in the petition is as shown in Table below:



Gujarat State Electricity Corporation Limited
Truing Up for FY 2015-16, Determination of Final ARR for FY 2016-17, Approval of MYT ARR for FY 2016-17 to FY 2020-21, and Determination of
Tariff for FY 2017-18

Table 2.1: Fixed Cost for GSECL for FY 2015-16

(Rs. Crore)												
Sr. No.	Power Station	Depreciation (Actual)	Interest & Finance charges (Actual)	Return on Equity (Actual)	O&M expenses (Actual)	Water Charges (Actual)	SLDC charges (Actual)	Tax (Actual)	Interest on working capital (Actual)	Total fixed cost (Actual)	Non- tariff income (Actual)	Net fixed charges
1	Ukai (1-5)	72.09	7.11	27.64	160.93	0.13	0.19	5.48	55.93	329.50	13.45	316.04
2	Ukai Extn. 6*	147.15	179.54	127.66	32.13	0.10	0.12	3.22	44.02	533.95	6.48	527.47
3	Gandhinagar (1-4)	117.16	3.12	40.77	98.60	11.01	0.20	4.25	53.28	328.40	11.62	316.79
4	Gandhinagar 5*	1.79	0.00	26.86	25.31	11.87	0.00	1.35	16.74	83.93	3.42	80.51
5	Wanakbori 1-6 TPS	101.88	1.16	64.24	179.55	35.76	0.31	8.12	107.74	498.75	26.31	472.44
6	Wanakbori 7 TPS*	1.59	0.00	26.05	15.33	8.18	0.03	1.35	16.69	69.22	2.42	66.80
7	Sikka TPS	33.90	0.00	22.94	58.55	2.28	0.06	1.55	22.95	142.22	5.20	137.02
8	Sikka Extn. (3-4)*	68.28	110.86	68.77	10.85	1.19	0.05	3.22	18.01	281.23	8.19	273.04
9	KLTPS 1-3	66.30	0.19	47.52	98.66	0.43	0.06	1.39	12.54	227.09	4.83	222.26
10	KLTPS 4	35.50	26.59	28.70	16.18	0.13	0.01	0.48	5.33	112.93	1.65	111.28
11	Dhuvaran CCPP 1*	19.00	0.00	11.17	25.83	0.21	0.02	0.69	9.46	66.39	1.74	64.65
12	Dhuvaran CCPP 2	20.04	9.62	16.11	27.25	0.76	0.03	0.72	10.85	85.38	1.81	83.57
13	Dhuvaran CCPP 3*	79.53	111.32	65.70	8.60	0.00	0.00	2.42	5.80	273.38	4.32	269.06
14	Utran (Gas)*	24.00	0.00	10.94	9.08	0.06	0.05	0.87	1.90	46.90	1.85	45.05
15	Utran Extension*	66.18	59.49	57.23	42.03	3.64	0.07	2.41	33.35	264.40	5.69	258.71
16	Ukai Hydro	32.18	0.22	9.78	14.30	0.00	0.07	1.97	1.32	59.84	3.51	56.33
17	Kadana Hydro	18.18	0.00	28.37	18.55	0.00	0.06	1.56	2.04	68.76	3.06	65.70
	Total	904.76	509.21	680.45	841.72	75.77	1.32	41.08	417.96	3,472.26	105.55	3,366.71

* PPA based stations.



Based on actual operating & fuel related parameters during FY 2015-16, table below indicates actual audited energy charges for GSECL's stations for FY 2015-16 along with the approved ones:

Table 2.2: Energy Charges For GSECL's Plants for FY 2015-16

Sr. No.	Power Station	Approved (Rs./kWh)	Actual (Rs./kWh)
1	Ukai (1-5)	2.97	2.95
2	Ukai Extn. 6*	2.55	2.68
3	Gandhinagar (1-4)	3.73	3.49
4	Gandhinagar 5*	3.29	3.31
5	Wanakbori 1-6 TPS	3.54	3.62
6	Wanakbori 7 TPS*	3.35	3.37
7	Sikka TPS	4.53	4.45
8	Sikka Extn. (3-4)*	2.44	3.55
9	KLTPS 1-3	1.50	1.46
10	KLTPS 4	1.44	1.53
11	Dhuvaran CCPP 1*	3.83	4.43
12	Dhuvaran CCPP 2	4.05	4.14
13	Dhuvaran CCPP 3*	-	-
14	Utran (Gas)*	-	-
15	Utran Extension*	4.34	4.04
16	Ukai Hydro	-	-
17	Kadana Hydro	-	-

* PPA based stations

Table below summarizes plant wise gains / (losses) calculated by GSECL on account of controllable/ uncontrollable factors, which are proposed to be shared with the Consumers as per the mechanism prescribed by the Commission in the GERC (MYT) Regulations, 2011.



Table 2.3: Gains / (Losses) on Account of Controllable Factors for FY 2015-16

(Rs. Crore)

Sr. No.	Power Station	O&M expense	Fuel cost	Total gains/(losses) due to controllable factors	Total gains/(losses) to be passed through (1/3 rd of gains/(losses))
1	Ukai (1-5)	0.06	9.97	10.03	3.34
2	Ukai Extn. 6*	-	-	-	-
3	Gandhinagar (1-4)	15.42	34.96	50.37	16.79
4	Gandhinagar 5*	-	-	-	-
5	Wanakbori 1-6 TPS	(14.81)	(28.61)	(43.41)	(14.47)
6	Wanakbori 7 TPS*	-	-	-	-
7	Sikka TPS	(0.80)	6.68	5.88	1.96
8	Sikka Extn. (3-4)*	-	-	-	-
9	KLTPS 1-3	(8.13)	5.80	(2.33)	(0.78)
10	KLTPS 4	4.09	2.25	6.34	2.11
11	Dhuvaran CCPP 1*	-	-	-	-
12	Dhuvaran CCPP 2	(4.96)	(0.46)	(5.41)	(1.80)
13	Dhuvaran CCPP 3*	-	-	-	-
14	Utran (Gas)*	-	-	-	-
15	Utran Extension*	-	-	-	-
16	Ukai Hydro	0.04	-	0.04	0.01
17	Kadana Hydro	(2.06)	-	(2.06)	(0.69)
	Total	(11.14)	30.59	19.45	6.48

* PPA based stations



Table 2.4: Gains/(Losses) on Account of Uncontrollable Factors for FY 2015-16

(Rs. Crore)

Sr. No.	Power Station	Depreciation	Interest & Finance charges	Return on Equity	Water Charges	SLDC charges	Tax	Interest on working capital	Non-Tariff income	Total gains/(losses) to be passed through
1	Ukai (1-5)	2.79	54.45	6.03	(0.13)	0.27	(4.48)	(28.53)	(11.82)	18.58
2	Ukai Extn. 6*	-	-	-	-	-	-	-	-	-
3	Gandhinagar (1-4)	(50.78)	9.27	(10.11)	19.46	0.16	(2.25)	(24.63)	(8.00)	(66.89)
4	Gandhinagar 5*	-	-	-	-	-	-	-	-	-
5	Wanakbori 1-6 TPS	5.17	67.78	4.57	4.81	0.37	(4.12)	(55.50)	(11.14)	11.95
6	Wanakbori 7 TPS*	-	-	-	-	-	-	-	-	-
7	Sikka TPS	(3.40)	3.91	(2.50)	1.61	0.07	0.45	(13.64)	(1.93)	(15.42)
8	Sikka Extn. (3-4)*	-	-	-	-	-	-	-	-	-
9	KLTPS 1-3	(6.20)	14.86	(3.84)	0.17	0.06	1.61	(0.46)	(1.56)	4.65
10	KLTPS 4	(0.33)	0.60	(0.28)	(0.13)	0.03	0.52	3.75	(0.58)	3.57
11	Dhuvaran CCPP 1*	-	-	-	-	-	-	-	-	-
12	Dhuvaran CCPP 2	1.60	(6.08)	(0.71)	(0.76)	0.03	0.28	(7.72)	(1.52)	(14.88)
13	Dhuvaran CCPP 3*	-	-	-	-	-	-	-	-	-
14	Utran (Gas)*	-	-	-	-	-	-	-	-	-
15	Utran Extension*	-	-	-	-	-	-	-	-	-
16	Ukai Hydro	(24.76)	2.18	(1.66)	-	0.09	(0.97)	(0.77)	(5.56)	(31.45)
17	Kadana Hydro	(3.11)	2.12	(0.37)	-	0.07	0.44	(0.94)	(4.13)	(5.92)
	Total	(79.01)	149.10	(8.87)	25.02	1.15	(8.52)	(128.45)	(46.24)	(95.83)

* PPA based stations



Based on the above estimated gains / (losses) on account of controllable and uncontrollable factors, GSECL has worked out gap/surplus of FY 2015-16 as given below:

Table 2.5: Net Entitlement calculated by GSECL for FY 2015-16

(Rs. Crore)

Sr. No.	Power Station	Gains/(Losses) due to controllable factors	Gains/(Losses) due to uncontrollable factors	Total Gains/(Losses) to be passed through
a	b	c	d	e= c/3 + d
1	Ukai (1-5)	10.03	18.58	21.93
2	Ukai Extn. 6*	-	-	-
3	Gandhinagar (1-4)	50.37	(66.89)	(50.10)
4	Gandhinagar 5*	-	-	-
5	Wanakbori 1-6 TPS	(43.41)	11.95	(2.53)
6	Wanakbori 7 TPS*	-	-	-
7	Sikka TPS	5.88	(15.42)	(13.46)
8	Sikka Extn. (3-4)*	-	-	-
9	KLTPS 1-3	(2.33)	4.65	3.87
10	KLTPS 4	6.34	3.57	5.68
11	Dhuvaran CCPP 1*	-	-	-
12	Dhuvaran CCPP 2	(5.41)	(14.88)	(16.69)
13	Dhuvaran CCPP 3*	-	-	-
14	Utran (Gas)*	-	-	-
15	Utran Extension*	-	-	-
16	Ukai Hydro	0.04	(31.45)	(31.44)
17	Kadana Hydro	(2.06)	(5.92)	(6.61)
	Total	19.45	(95.83)	(89.35)

* PPA based stations

2.3 Multi-Year Tariff for Third Control Period FY 2016-17 to FY 2020-21

GSECL has projected the fixed and variable cost for FY 2016-17 to FY 2020-21 on the basis of GERC (MYT) Regulations, 2016 & actual figures for the FY 2015-16.

The Fixed and Variable cost of GSECL's Generating Plants for FY 2016-17 to FY 2020-21 are estimated as under:



Table 2.6: Proposed Total Fixed Cost of GSECL Plants for FY 2016-17 to FY 2020-21

(Rs. Crore)

Sr. No.	Power Station	2016-17	2017-18	2018-19	2019-20	2020-21
1	Ukai (1-5)	380.33	502.84	346.32	387.80	367.06
2	Ukai Extn. 6*	572.02	563.60	555.66	547.58	540.38
3	Gandhinagar (1-4)	243.24	201.99	209.46	217.34	225.45
4	Gandhinagar 5*	89.29	78.50	81.83	85.40	89.23
5	Wanakbori 1-6 TPS	521.93	573.24	632.00	671.83	711.80
6	Wanakbori 7 TPS*	74.02	70.09	72.74	75.58	78.61
7	Sikka TPS	167.93	295.44	-	-	-
8	KLTPS 1-3	230.95	194.70	202.14	210.01	218.12
9	KLTPS 4	109.78	108.35	106.30	104.09	102.17
10	Dhuvaran CCPP 1*	65.81	67.82	70.00	72.29	74.72
11	Dhuvaran CCPP 2	87.43	90.05	94.44	98.48	104.52
12	Dhuvaran CCPP 3*	341.92	340.40	337.85	335.31	333.39
13	Utran (Gas)*	106.86	-	-	-	-
14	Utran Extension*	259.06	257.94	256.70	255.41	254.58
15	Ukai Hydro	86.87	34.37	35.82	37.36	38.98
16	Kadana Hydro	71.59	63.27	65.02	66.92	68.86
17	Sikka Extn. (3-4)*	656.36	646.35	635.49	624.85	615.25
18	Wanakbori 8 TPS*	-	-	540.96	904.63	890.10
19	Dhuvaran STPS*	-	-	-	-	1,283.02
	Total	4,065.38	4,088.97	4,242.74	4,694.88	5,996.26

* PPA based stations



Table 2.7: Proposed Station Wise Energy Charges for FY 2016-17 TO FY 2020-21

(Rs./kWh)

Sr. No.	Power Station	2016-17	2017-18	2018-19	2019-20	2020-21
1	Ukai (1-5)	3.44	3.50	3.60	3.66	3.70
2	Ukai Extn. 6*	2.99	3.08	3.17	3.27	3.36
3	Gandhinagar (1-4)	3.75	3.87	3.99	4.11	4.23
4	Gandhinagar 5*	3.52	3.63	3.74	3.85	3.97
5	Wanakbori 1-6 TPS	3.74	3.86	3.94	4.06	4.10
6	Wanakbori 7 TPS*	3.47	3.55	3.66	3.77	3.89
7	Sikka TPS	4.27	4.32	0.00	0.00	0.00
8	KLTPS 1-3	2.81	2.89	2.97	3.07	3.16
9	KLTPS 4	2.87	2.81	2.90	2.98	3.08
10	Dhuvaran CCPP 1*	2.57	2.67	2.80	2.94	3.09
11	Dhuvaran CCPP 2	2.50	2.62	2.75	2.89	3.03
12	Dhuvaran CCPP 3*	4.22	4.43	4.65	4.89	5.13
13	Utran (Gas)*	4.81	0.00	0.00	0.00	0.00
14	Utran Extension*	4.24	4.46	4.68	4.91	5.16
15	Ukai Hydro	0.00	0.00	0.00	0.00	0.00
16	Kadana Hydro	0.00	0.00	0.00	0.00	0.00
17	Sikka Extn. (3-4)*	3.19	3.20	3.23	3.33	3.43
18	Wanakbori 8 TPS*	0.00	0.00	2.94	2.94	2.94
19	Dhuvaran STPS*	0.00	0.00	0.00	0.00	2.94

* PPA based stations

2.4 Request of GSECL

Petitioner's Prayer:

1. To admit the petition for True-Up of FY 2015-16, Multi-Year Aggregate Revenue Requirement for FY 2016-17 to FY 2020-21, Determination of Final ARR for FY 2016-17 and Determination of Tariff for FY 2017-18.
2. To approve the gains / losses for the True-Up for FY 2015-16 and allow sharing of such gains / losses as prescribed in the GERC (MYT) Regulations, 2011.
3. To approve the operational and financial parameters of GSECL for FY 2015-16 considering the vintage and constraints of the old machines, and consider the same for recovery of full fixed cost.



4. To approve the Station operating parameters viz. PAF, Auxiliary Consumption, Station Heat Rate, Transit Loss, Specific Oil Consumption and actual fuel rate for each of the stations of GSECL for FY 2015-16 for recovery of variable cost considering the vintage and constraints of the old machines as well as site specific constraints.
5. To approve the Station operating parameters viz. PAF, Auxiliary Consumption, Station Heat Rate, Transit Loss, Specific Oil Consumption and actual fuel rate for each of the station of GSECL for MYT control period FY 2016-17 to FY 2020-21 for recovery of variable cost.
6. To approve Aggregate Revenue Requirement and Capital Expenditure for MYT third control period FY 2016-17 to FY 2020-21.
7. To approve that, in the event of prior decommissioning of Ukai 1-2 and Sikka 1-2 before the date mentioned in the Petition, the Fixed Cost would be recovered only till actual date of decommissioning and any balance depreciation shall be recovered subsequently.
8. To approve reimbursement of Tax on Income earned through the sale of power for all power stations including PPA governed stations.
9. To approve Final ARR for FY 2016-17, the gap between Final ARR of FY 2016-17 & Provisional ARR of FY 2016-17 and address this gap during the true-up of FY 2016-17,
10. To approve Tariff for FY 2017-18.
11. To grant any other relief as the Commission may consider appropriate.
12. To allow further submissions, addition and alteration to this Petition as may be necessary from time to time.
13. Pass any other order as the Commission may deem fit and appropriate under the circumstances of the case and in the interest of justice.



3 Brief outline of objections raised, response from GSECL, and Commission's View

3.1 Public Response to the Petition

In response to the public notice inviting objections / suggestions from stakeholders on the petition filed by GSECL for True-up (ARR) of FY 2015-16, for approval of Aggregate Revenue Requirement (ARR) for generation business for the control period FY 2016-17 to FY 2020-21, determination of final ARR for FY 2016-17, and determination of tariff for FY 2017-18, many Consumer organisations filed their objections in writing within the prescribed time limit or during hearing. The Commission has considered the objections / suggestions, the issues presented before the commission, and the response of GSECL on the same.

The details of submissions made by the objectors, responses of the petitioner, and the views of the Commission are summarized in the following sections.

3.2 Issue wise submissions and replies

Issue 1: Old units of GSECL have considerably low PLF and high generation - cost

The objector submitted that the old units of GSECL have outlived their useful lives. Currently these units are inefficient and thus the power generated from these units is very costly. This adds to the existing burden on consumers.

Response of GSECL

The petitioner submitted that though these units are more than 30 years old, it maintains the units in healthy condition & PAF of these units always remained more than 80%. Units are available and operated as per the schedule given by SLDC, hence the low plant load factor is beyond the control of the petitioner.

The petitioner further stated that it has initiated actions for closing down & retirement of old and inefficient units after critical evaluation and examination of operational as well as financial performance of the units. The petitioner has already retired 2 x 120MW units of GTPS in the month of Sept, 2016, and Utran Unit-I of 135 MW is proposed to be decommissioned from Feb, 2017. Further, 2 x 120 Units at Ukai TPS and 2 x 120



MW units at Sikka TPS are also proposed to be retired during F.Y. 2017-18 as per the schedule submitted in the petition.

Objector's Reply to Petitioner's Reply

The objector stated that PAF cannot be the only criteria for keeping the machines in the system and let consumers bear the burden. It further said that post useful life, only competitive plants should be made to operate and hence, consumers should not be made victims of the stranded capacity.

Furthermore, the objector is of the opinion that Sikka TPS could have been retired much earlier to avoid cost recovery benefit beyond limit. Similarly, GSECL should have timely decommissioned the units. The objector requests the Commission to direct GSECL on objective norms of decommissioning.

Commission's View

Commission has noted the Petitioner's reply.

Issue 2: Poor renewable power installed capacity for GSECL

The objector submitted that GSECL has poor renewable power capacity in comparison to overall renewable capacity percentage of nation.

Response of GSECL

The existing renewable capacity of petitioner is 24 MW i.e. 0.39% of installed capacity. The petitioner has initiated the actions for implementation of 150 MW solar power plant at Charanka under VGF scheme of MNRE, Govt. of India.

Commission's View

Commission has noted the Petitioner's reply.

Issue 3: Petitioner has converted all factors into uncontrollable factors and passed on to the consumers. Imported coal should not be allowed for Sikka 3&4 to reduce cost of generation.

The objector submitted that the petitioner has converted all controllable factors to uncontrollable factors in violation of the MYT Regulations. The losses due to inefficient power plants are passed on to consumers.



Response of GSECL

GSECL submitted that it has considered controllable and uncontrollable factor as per the Regulations notified by the Commission.

Further, Sikka Units Nos. 3 & 4 are designed on imported coal having high GCV and low ash content. As Boiler and Ash Handling system are designed accordingly, indigenous coal is not suitable due to its high ash content of 30%. Furthermore, GSECL has operated Sikka 3 & 4 at low PLF as per the system requirement and as this unit is PPA governed, so there is no loss passed on to the consumers.

Commission's View

Response of GSECL is self-explanatory and the petition has been submitted in accordance to GERC MYT Regulations.

Issue 4: GSECL did not submit the actual transit loss

The objector has submitted that the petitioner has not submitted the details of the actual transit loss.

Response of GSECL

GSECL has submitted that the actual transit loss for 2015-16 is as shown at Table No. 18 of GSECL Petition No: 1619/2016. Furthermore, the transit loss of GSECL is less than that approved by the Commission.

Commission's View

Response of GSECL is self-explanatory.

Issue 5: Performance indicators such as PLF, SHR, Auxiliary Consumption and Sp. Oil Consumption are very poor.

Response of GSECL

The Petitioner submitted that Sikka Unit 3 & 4 were under stabilization after COD, so the plant was not operated as per design. The units were taken under COD w.e.f 14.09.2015 and 28.12.2015 respectively.

The petitioner further submitted that the actual Station Heat Rate achieved in most of the Power Stations was achieved as approved by the Commission except for



Wanakbori 1-6 and Dhuvaran-1. Reasons attributed to higher station heat rate of Wanakbori 1-6 is continuous part load operation of the units, as the units are operating on full load capacity for the maximum 24 hours in a day. Dhuvaran CCPP 1 has 4.50 Lakh SCM APM domestic gas allocation from GAIL, but unfortunately actual daily gas allocation is about 2.5 to 2.8 Lakh SCM, so the unit is getting frequent starts and stops that result into deterioration of station heat rate.

Auxiliary consumption has increased due to partial load operation on account of backing down. Furthermore, during backing down, majority of the auxiliaries are required to run. Also, during RSD of units, minimum auxiliaries are required to be run to keep the units available for generation so as to take the same in service as per system requirement.

Commission's View

Response of GSECL for poor performance of plants is noted. The Commission is of the opinion that GSECL should endeavor to reduce the cost of generation and qualify in the Merit Order by exploring all available means.

Issue 6: Cost of generation from GSECL plants is very high

The cost of generation is increasing due to poor performance of GSECL plants and low PLF.

Response of GSECL

GSECL submitted that Station Heat Rate of Sikka 3 & 4 is higher as the units were under stabilization, whereas the reason for high energy charges was frequent/daily starts and stops of Dhuvaran CCPP-I due to non-availability of cheaper domestic gas.

Ukai Unit No. 6 was operated from April-Aug 2015 on part load due to ESP problem. Similarly, the part load operation of Wanakbori Unit Nos. 1 to 6 due to backing down has resulted into deterioration of heat rate, and eventually into higher actual energy charge as compared to that approved rate by the Commission.

Further, it is stated by the petitioner that except Wanakbori Unit No.1 to 6, GSECL has not demanded to pass on the losses to the consumers. Also the petitioner has passed the gains on fuel cost to the tune of Rs. 30.59 Crore to the consumers on account of better operational efficiency.



Commission's View

The response of the petitioner is noted.

Issue 7: Non consideration of fly ash income in the head of Non-Tariff Income.

The objector submitted that the petitioner has not included income from fly-ash in non-tariff income.

Response of GSECL

It is to state that as per MOEF notification, GSECL is required to maintain separate account for Fly Ash income and expenditure incurred to promote sale of fly ash.

Regarding Truing up of FY 2015-16, petitioner requested the Commission not to consider fly ash income amounting Rs. 58.14 Crore.

Commission's View

Response of Petitioner is noted. The Commission has included the fly-ash income while considering non-tariff income.

Issue 8: Depreciation for phased out Gandhinagar Unit 1&2 and Ukai Hydro plant is not claimed appropriately

The petitioner has claimed the remaining complete depreciation of GTPS 1 & 2 in 2015-16 whereas the units were decommissioned in 2016-17. Hence, prorata depreciation should be claimed in 2015-16 true-up. High depreciation charged for Ukai Hydro is a burden to the consumers.

Response of GSECL

Regarding gap of loss on depreciation, GSECL submitted that, the petitioner planned to decommission Gandhinagar Unit 1 & 2 by 31st March, 2016, accordingly balance depreciation i.e 90% of fixed assets as on 31.03.2016 is charged during FY 2015-16.

Further, it is to state that the petitioner has charged higher depreciation since 2012-13 in a planned manner to depreciate the asset by 31st March 2016, whereas the Commission has not approved the higher depreciation.

GSECL further submits that any additions or extension to an existing asset which is of a capital nature and which becomes integral part of an existing asset is depreciated at



the rates of depreciation which are applied to an existing asset however Ukai Hydro has completed the life of 40 Years and therefore company has depreciated the addition during the year to this plant up to 90 % as per MYT Regulations. Moreover, it is to state that as per Accounting Standard-6 issued by Institute of Chartered Account of India, depreciation is systematic allocation of cost of asset over useful life. Hence, depreciation is charged accordingly.

Commission's View

The Commission has noted the objection. The Commission has taken appropriate view while allowing depreciation.

Issue 9: Cost benefit analysis for huge R&M expenditure is not submitted. GSECL should explain the benefits

Response of GSECL

The petitioner submitted that as per MYT requirement for FY 2016-17 to 2020-21, it has initiated R&M work for:

Efficiency improvement:

- Retrofitting of Turbine
- Boiler Back Pass

Environment Improvement:

- ESP retrofitting

Further petitioner stated that it has started the turbine retrofitting of Ukai Unit No. 4. It is expected that station heat rate of Ukia Unit No.4 would be reduced by 300 Kcal/kWh in the month of March, 2017. The expected benefit in variable cost would be Rs. 0.35/kWh. Capital expenditure for turbine retrofitting is Rs. 112.64 Crores & payback period would be 2.5 years depending upon actual Generation for the said unit. Similarly, due to modification in boiler back pass, the efficiency of boiler would be increased by 1 %. Capital expenditure is Rs. 56 Crores, which will result in variable cost reduction of Rs. 0.05/kWh. Also, ESP retrofitting is to comply with the new environmental norms issued by MOEF, Govt. of India and for providing better surrounding atmosphere of power plant to the local inhabitant.



Commission's View

The response of the petitioner is self explanatory.

Issue 10: Energy Charges of Sikka TPS is very high

The objector submitted that energy charges of Rs. 4.53/4.45 per unit for Sikka TPS is very high.

Response of GSECL

GSECL submitted that the Sikka Power Station is distantly located from the coal mines for which railway freight charges are Rs.2955 per MT. Therefore, variable cost per unit is high. These units are operated as per system requirement and voltage stability in Saurashtra region. Further, the petitioner has installed two units of 250 MW in coastal region and these units are run on imported coal for better efficiency and to reduce freight charges. The company has also decided to decommission Sikka Unit No. 1&2 during 2017-18.

Commission's View

The response of the petitioner is self-explanatory.

Issue 11: Cost increase due to delays in project commissioning passed on to consumers

The objector submitted that inordinate delays in commissioning of Dhuvaran III and Sikka 3&4, has resulted in increased costs. These costs are passed on to consumers as fixed cost.

Response of GSECL

Regarding cost overrun of Sikka Unit No.3 and 4 and Dhuvaran CCPP Unit No.3, it is to submit that both the EPC contracts were awarded on firm price basis and there is no provision of price escalation. Hence, there is no extra amount paid to the EPC contractor towards time overrun.

Commission's View

The Commission will take appropriate view at the time of finalizing the capital cost of these projects.



Issue 12: Power procurement should be through competitive bidding and not MoU

The objector submitted that power procurement through MoU route is very costly. Rather, tariff based competitive bidding route should be taken by utilities to reduce the power procurement cost.

Response of GSECL

The petitioner submitted that as per Government guidelines, generation capacity addition through competitive bidding is not in the purview of GSECL.

Objector's Reply to Petitioner's Reply

The objector requests the Commission to direct GUVNL to ensure generation capacity addition with Tariff Based Offers only.

Commission's View

The response of petitioner is self explanatory and noted.

Issue 13: Non-compliance of AS 6 regarding useful life of power plants (35 years against 25 years)

The petitioner has not considered useful life of power plants as per AS-6 and CERC Regulations.

Response of GSECL

GSECL submitted that the capital spares and other machineries were procured for Renovation and Modernization of the units. The capital spares/other machineries are capable of being used in the business for more than one accounting period, as they are having limited useful life and are held for the Company for production / supply of the goods or services. The same is therefore, capital spares and not the machinery spares as stated in Audit Report. Further, the Company is entitled to charge the depreciation since the assets are ready to use and in fact used also. The treatment given by the Company is in conformity with the AS-6 and AS-10.

Moreover, the Management of GSECL, considering MYT order No. 1061, has decided to amortize Gandhinagar Plants I & II by 2015-16, and, therefore, has charged additional depreciation, which is also in conformity of AS-6 and AS-10 as the



management has decided to decommission the units 2X120 MW of Gandhinagar TPS in FY 2015-16 as the useful life of the plant is completed. Now plant and machinery of unit 1 & 2 is fully depreciated.

Commission's View

The response of the petitioner is noted.

Issue 14: Overcharging and understating figures by arbitrarily complying with accounting standards regarding depreciation

The objector has referred to GSECL Auditor's report and claimed that regarding depreciation, company is not complying with the accounting standards

Response of GSECL

GSECL submitted that all the Thermal Plants of GSECL (erstwhile GEB) have generally worked without R&M for more than 35 years. The management of GSECL has also carried out technical evaluation of the life of Thermal Plants by independent Chartered Engineers, and their report shows that Plants can run for more than 35 years. Further, GERC has considered 25 years as the life of the Plant because PPA is for 25 years for recovering the fixed cost by way of deprecation for the benefit of consumers at large. The Companies Act prescribes the life of the Plant as 45 years. Considering both the factors and evaluation of the independent consultant, the management decided to consider useful life of the plant as 35 years on conservative basis to reduce burden on consumers by providing lower depreciation in books of accounts.

GSECL further stated that the derived profit of Rs. 13767.09 Lakh is as per the applicable accounting standards, accounting principles and Companies Act. Comptroller and Auditor General of India has carried out audit and found it in order and issued NIL comments. Also, any increase or decrease in the audited profit of the petitioner has no impact on Tariff Petition.

Commission's View

The response of the petitioner is noted.



Issue 15: The non-generating power plants of GSECL should supply to Torrent Power

The objector has stated that as few of the plants of GSECL are not generating, GSECL should consider selling power from these plants to Torrent Power.

Response of GSECL

GSECL is power generating company and 100% capacity of all the power stations is tied up with GUVNL. Therefore, power supply to Torrent is not feasible.

Commission's View

The response of the petitioner is noted.

Issue 16: Petitioner should claim fixed cost commensurate with the average PLF

The objector has stated that GSECL should claim fixed cost commensurate with the average power plants' PLF of 35.5%. This is against Section 61 of Electricity Act.

Response of GSECL

GSECL units operated as per the schedule given by SLDC and as per system demand by following merit order dispatch, which is beyond the control of the petitioner. GSECL has claimed fixed costs as per GERC MYT Regulations.

Commission's View

The submission of the petitioner is noted and the fixed cost is calculated as per GERC MYT Regulations.

Issue 17: Power generation data from Solar and Wind plants is not provided

The objector stated that the petitioner has not submitted units of power generated from 10 MW wind power plant and 12 MW solar power plant.

Response of GSECL

GSECL submitted that tariff approval of wind and solar plants is not asked as the respective tariff of renewable power plants is fixed as per PPA. However, the generation details are as provided below:



Table 3.1: Generation details of Wind and Solar Power Plants

Name of Station	Generation (MUs)
Ash Dyke GTPS (Solar) -1 MW	1.16
Canal Top Chandrasan (Solar) -1 MW	1.57
Charanka (Solar) -10 MW	19.00
Layza (Wind Farm) -10 MW	16.57
(Solar + Wind Farm) -22 MW TOTAL	38.90

Commission's View

Petitioner has submitted the required details.

Issue 18: Coal linkages of GSECL are in danger and Commission should look into plants with low PLF even though availability is high.

Response of GSECL

GSECL submitted that it had filed the Petition for Must Run Operation vide No: 1343/2013 and Review Petition No: 1398/2013, for the coal linkage. However, it was not considered by the Commission.

Commission's View

GSECL should decrease the cost of generation so as to be competitive to qualify in the Merit Order.

Issue 19: Given current scenario of power surplus in the state, Commission, in collaboration with state government, should promote competition among power generators.

Response of GSECL

GSECL has not offered any comment.

Commission's View

Commission takes note of the submission made by the objector.



Issue 20: GSECL should be allowed to sell power to entities other than GUVNL

The objector submitted that at present GSECL can only supply to GUVNL. It should be allowed to sell to other entities so there could be optimum utilization of the assets.

Response of GSECL

GSECL has signed PPA with GUVNL for 100% installed capacity. Hence, GSECL cannot sell power other than GUVNL.

Commission's View

The Commission has noted the Petitioner's reply.

Issue 21: GSECL should clarify the sudden increase in per unit fixed cost from past years

The objector stated that the fixed cost of GSECL has increased considerably from FY 2013-14 to FY 2015-16 and requested GSECL to substantiate.

Response of GSECL

GSECL submitted that fixed costs per unit is dependent on the actual generation which is as per the schedule given by SLDC as per system demand. During FY 2014-15, GSECL power stations received higher schedule of Generation. So, the Fixed Cost per unit was low, however during FY 2015-16 GSECL power stations have received low schedule, hence lower units were generated that resulting in high fixed cost per unit.

Commission's View

The Commission has noted the submission made by the petitioner.

Issue 22: GSECL's achieved transit loss should be the target for next MYT period

The objector submitted that GSECL has been able to reduce transit loss to a much lower value than the normative transit loss. Hence, the achieved figure should be benchmark for next control period.

Response of GSECL

The petitioner noted the point raised by the objector.



Commission's View

Commission has taken note of the submission made by the objector and will decide accordingly.

Issue 23: Inefficient plants should be decommissioned to reduce per unit power cost

The objector submitted that the inefficient power plants such as Sikka TPS should be decommissioned so that power cost per unit can be reduced.

Response of GSECL

GSECL submitted that it has planned to decommission 120 MW units. Under that planning, Gandhinagar Unit 1-2 of 120 MW are decommissioned on 03.09.2016, Utran 135 MW on 31.01.2017, and 2 units of 120 MW each at Ukai TPS & Sikka TPS during 2017-18 will be decommissioned.

Commission's View

The Commission has noted the submission made by the petitioner.

Issue 24: GSECL should clarify the need for which the loan from GUVNL was taken

Response of GSECL

GSECL submitted that the amount is against sundry debtors i.e. sale of power to GUVNL. Further, GSECL stated that GUVNL is liable to pay delay payment charges to GSECL as per MYT Regulations if bills are paid by GUVNL after 60 days. In FY 2015-16, GUVNL paid Rs. 64.39 Crores to GSECL. GSECL has passed on the same amount to the consumer under the head non-tariff income.

Commission's View

The response of petitioner is self-explanatory.

Issue 25: GSECL already has profit in annual accounts

The objector submitted that GSECL already has a profit of Rs. 137.67 Crore in its annual accounts, whereas it is seeking gap of Rs. 89.35 Crore in ARR.



Response of GSECL

GSECL submitted that it has paid Minimum Alternate Tax (MAT) of Rs. 36.24 Crore as per Income Tax Act-1961. Whereas revenue gap of Rs. 89.35 Crores is worked out as per GERC (MYT) Regulations, 2016. Both Tax paid and Gap cannot be correlated due to different underlying frame work.

Commission's View

The Commission noted the submission made by the petitioner. The petition is in accordance with GERC MYT Regulations. Hence, annual accounts cannot be correlated with provisions of GERC MYT Regulations.

Issue 26: GSECL should keep the fuel cost of 2015-16 as base cost for MYT period

The objector pointed that GSECL has considered increasing fuel costs for complete control period whereas the base cost of true-up year should be considered for the variable cost projections.

Response of GSECL

GSECL submitted that fuel cost as well as transportation cost is increasing each year and accordingly, it has escalated the projected cost. But as fuel cost is charged at actual during true-up, any statutory rise or fall in cost is always passed on to the beneficiaries.

Commission's View

The Commission will consider fuel cost for the next control period as per the past practice followed.



4 Truing up of FY 2015-16

4.1 Generating Stations of GSECL

GSECL owns and operates the following generating stations as on 1st April, 2015.

- Coal based thermal generating stations at Ukai, Gandhinagar, Wanakbori and Sikka;
- Lignite fired thermal station at KLTPS;
- Gas fired stations at Utran and Dhuvaran;
- Major hydel stations at Ukai and Kadana and mini hydel stations at Panam, windmills at Layza and solar power plant at Gandhinagar, Sanand canal and Charanka.

The details of the stations existing as on 1st April, 2015 along with their capacities and dates of commissioning are given in the Table below:

Table 4.1: Capacity and COD of GSECL generating stations as on 1st April, 2015

Name of Station	Unit No.	Capacity of the Unit (MW)	Date of Commissioning
Ukai	1	120	19/3/1976
	2	120	23/6/1976
	3	200	21/1/1979
	4	200	11/9/1979
	5	210	30/1/1985
	Sub Total	850	
Gandhinagar	1	120	13/3/1977
	2	120	10/4/1977
	3	210	20/3/1990
	4	210	20/7/1991
	5	210	17/3/1998
	Sub Total	870	
Wanakbori	1	210	23/3/1982
	2	210	15/1/1983
	3	210	15/3/1984
	4	210	9/3/1986
	5	210	23/9/1986



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Name of Station	Unit No.	Capacity of the Unit (MW)	Date of Commissioning
	6	210	18/11/1987
	7	210	31/12/1998
	Sub Total	1470	
Sikka	1	120	26/3/1988
	2	120	31/3/1993
	Sub Total	240	
KLTPS	1	70	29/3/1990
	2	70	25/3/1991
	3	75	31/3/1997
	4	75	20/12/2009
	Sub Total	290	
Dhuvaran	7 – Gas	106.617	28/1/2004
	8 – Gas	112.45	1/11/2007
	Sub Total	219.067	
Utran	GT – 1	30	17/12/1992
	GT – 2	30	28/12/1992
	GT – 3	30	7/5/1993
	STG	45	17/7/1993
	Sub Total	135	
Utran Extension	GT -1	375	8/11/2009
Ukai TPS	6	500	8/6/2013
SUB TOTAL GSECL (Coal + Lignite)		4720	
SUB TOTAL GSECL (Gas)		1105	
TOTAL GSECL (Thermal)		5825	
Ukai Hydro	1	75	8/7/1974
	2	75	13/12/1974
	3	75	22/4/1975
	4	75	4/3/1976
	Sub Total	300	
Ukai LBC	1	2.5	8/12/1987
	2	2.5	19/2/1988
	Sub Total	5	



Name of Station	Unit No.	Capacity of the Unit (MW)	Date of Commissioning
Kadana Hydro	1	60	31/3/1990
	2	60	2/9/1990
	3	60	3/1/1998
	4	60	27/5/1998
	Sub Total	240	
Wind Mill	Layza	10	04/01/2009
Solar	Plant at GTPS (Ash Dyke)	1	27/03/2012
	Plant at Sanand branch Canal	1	29/03/2012
	Charanka	10	23/03/2015
Total		5517.74	

During the FY 2015-16, the petitioner commissioned following plants:

Table 4.2: Plants commissioned in FY 2015-16

Name of Station	Unit No.	Capacity of the Unit (MW)	Date of Commissioning
Sikka TPS (3&4)	3	250	14/09/2015
	4	250	28/12/2015
Dhuvaran (Gas)	3	376	01/02/2016
Total		876	

4.2 Operating Performance Parameters

The fuel cost of a generation station depends on (i) the performance parameters, such as PLF, Station Heat Rate, Auxiliary Consumption, Specific Fuel Oil Consumption and Transit Loss of coal (in case of coal station), which are controllable and (ii) cost parameters such as Gross Calorific Value of fuel, type of fuel and price of fuel, which are uncontrollable.

GSECL has submitted the actual operating performance on Plant Availability Factor (PAF), Plant Load Factor (PLF), Station Heat Rate, Coal transit loss, Auxiliary Consumption (AC) and Specific Oil Consumption etc. for FY 2015-16 for the individual stations. The Commission has taken up the truing up of the annual performance parameters for FY 2015-16, which is discussed in the following sections.



4.2.1 Plant Availability Factor (PAF)

Petitioner's Submission

GSECL has submitted the actual plant availability of different stations for FY 2015-16. The PAF (i) approved in the MYT order dated 11th April, 2011; and (ii) the actuals as furnished by GSECL in the petition for the period are given in the Table below:

Table 4.3: Plant Availability Factors for FY 2015-16

			(in %)
Sr. No.	Power stations	Approved for 2015-16	Actuals for 2015-16
1	Ukai (1-5)	75.00	77.57
2	Ukai Extn. 6*	85.00	83.84
3	Gandhinagar (1-4)	79.00	78.49
4	Gandhinagar- 5*	80.00	90.91
5	Wanakbori 1-6 TPS	85.00	90.98
6	Wanakbori 7 TPS*	80.00	93.62
7	Sikka TPS	75.00	85.79
8	KLTPS 1-3	75.00	70.89
9	KLTPS 4	80.00	44.86
10	Dhuvaran CCPP 1*	80.00	92.86
11	Dhuvaran CCPP 2	85.00	93.44
12	Dhuvaran CCPP 3*	85.00	0.00
13	Utran (Gas)*	80.00	99.98
14	Utran Extension *	80.00	79.60
15	Ukai Hydro	80.00	82.87
16	Kadana Hydro	80.00	91.03
17	Sikka Extn. (3-4)*	85.00	36.01

* PPA based stations.

It is observed from the above Table that the stations Ukai - 6, Gandhinagar 1-4, KLTPS 1-3, KLTPS 4, Utran Extension and Sikka Extn. 3 & 4 have achieved lower PAF than approved by the Commission in the respective order for FY 2015-16.



GSECL has submitted the reasons for deviation, in respect of the stations where the actual PAF was low as compared to approved PAF for FY 2015-16, as given below:

- **Sikka Extn 3-4:** Unit 3 & 4 were declared under Commercial operation from 14.09.2016 & 28.12.2016 respectively and were under stabilization phase.
- **KLTPS 1-3:** KLTPS Unit No. 3 of 75 MW was running at 50-55 MW due to problem in rotary APH baskets. The replacement of damaged APH baskets was completed during the planned outage of unit from 13.07.2015 to 10.08.2015. After commissioning of the unit with newly replaced APH baskets, rated load of 75 MW has been achieved on this unit.
- **KLTPS - 4:** The load on unit was restricted to 48-50 MW due to problem of tubular APH blocks, which have been replaced during the outage of unit from 12.08.2015 to 05.10.2015. Thereafter, the rated load on unit was achieved.
- **Ukai-6:** The load on unit was reduced to 360-400 MW during the period from April, 2015 to July, 2015 due to ESP Problem
- **Gandhinagar (1-4):** Forced outages of Unit No. 1 & 2

GSECL has requested the Commission to approve plant availability as proposed by GSECL.

Commission's Analysis

The actual PAF is less than the approved one in case of Gandhinagar 1-4, Ukai-6, KLTPS 1-3, KLTPS 4, Sikka Extn. 3 & 4 and Utran extension. Petitioner has explained the reasons for low PAF of these plants. The submissions have been noted.

However, as the Plant Availability Factor is considered to be controllable, for truing up purpose the PAF as approved in the respective order for FY 2015-16 is considered.

The PAF approved for truing up purpose for FY 2015-16 for each station is given in the Table below:



Table 4.4: Plant Availability Factors approved for truing up for FY 2015-16

(in %)

Sr. No.	Power stations	Approved for 2015-16	Actuals for 2015-16	Approved in Truing up 2015-16
1	Ukai (1-5)	75.00	77.57	75.00
2	Gandhinagar (1-4)	79.00	78.49	79.00
3	Wanakbori 1-6 TPS	85.00	90.98	85.00
4	Sikka TPS	75.00	85.79	75.00
5	KLTPS 1-3	75.00	70.89	75.00
6	KLTPS 4	80.00	44.86	80.00
7	Dhuvaran CCPP 2	85.00	93.44	85.00
8	Ukai Hydro	80.00	82.87	80.00
9	Kadana Hydro	80.00	91.03	80.00
10	Ukai Extn. 6*	85.00	83.84	85.00
11	Gandhinagar 5*	80.00	90.91	80.00
12	Wanakbori 7 TPS*	80.00	93.62	80.00
13	Sikka Extn. (3-4)*	85.00	36.01	85.00
14	Dhuvaran CCPP 1*	80.00	92.86	80.00
15	Dhuvaran CCPP 3*	85.00	0.00	85.00
16	Utran (Gas)*	80.00	99.98	80.00
17	Utran Extension*	80.00	79.60	80.00

* PPA based stations.

4.2.2 Plant Load Factor (PLF)

Petitioner's Submission

GSECL has submitted the actual Plant Load Factor of different stations for FY 2015-16. The PLF (i) approved in the MYT order dated 11th April, 2011 and (ii) the actuals as furnished by GSECL in the petition for the period are given in Table below:

Table 4.5: Plant Load Factors for FY 2015-16

(in %)

Sr. No.	Power stations	Approved for 2015-16	Actuals for 2015-16
1	Ukai (1-5)	75.00	41.56
2	Gandhinagar (1-4)	79.00	22.67
3	Wanakbori 1-6 TPS	85.00	41.58
4	Sikka TPS	71.00	15.99
5	KLTPS 1-3	75.00	68.00



Sr. No.	Power stations	Approved for 2015-16	Actuals for 2015-16
6	KLTPS 4	75.00	48.96
7	Dhuvaran CCPP 2	80.00	32.94
8	Ukai Hydro	13.00	18.55
9	Kadana Hydro	6.00	13.39
10	Ukai Extn. 6*	85.00	55.83
11	Gandhinagar 5*	85.00	76.84
12	Wanakbori 7 TPS*	85.00	58.57
13	Sikka Extn. (3-4)*	85.00	31.36
14	Dhuvaran CCPP 1*	80.00	9.78
15	Dhuvaran CCPP 3*	85.00	0.00
16	Utran (Gas)*	80.00	0.00
17	Utran Extension*	80.00	38.66

* PPA based stations

Petitioner has submitted following reasons for plants that have achieved low PLF:

- Low schedule in the case of Ukai 1-5, Ukai 6, Gandhinagar 1-4, Gandhinagar 5, Wanakbori 1-6, Wanakbori 7, Sikka 1-2, Dhuvaran CCPP 1, Dhuvaran CCPP 2, Dhuvaran CCPP 3, Utran Gas and Utran extension.
- **Sikka Extn 3-4:** Unit 3 & 4 were declared under Commercial operation from 14.09.2016 & 28.12.2016 respectively and were under stabilization phase
- **KLTPS 1-3:** KLTPS Unit No. 3 of 75 MW was running at 50-55 MW due to problem in rotary APH baskets. The replacement of damaged APH baskets was completed during the planned outage of unit from 13.07.2015 to 10.08.2015. After commissioning of the unit with newly replaced APH baskets, rated load of 75 MW has been achieved on this unit.
- **KLTPS 4:** The load on unit was restricted to 48-50 MW due to problem of tubular APH blocks, which have been replaced during the outage of unit from 12.08.2015 to 05.10.2015. Thereafter the rated load on unit was achieved.

Commission's Analysis

The Commission has analyzed the submissions made by the petitioner in Table above. It is observed that all the stations except Ukai & Kadana hydro stations achieved less PLF for FY 2015-16 than approved in the respective order. The Commission has



taken note of the above submissions made by petitioner and approved the PLF for FY 2015-16 for truing up purpose as given in the Table below:

Table 4.6: PLF Approved for FY 2015-16 for truing up purpose

(in %)

Sr. No.	Power stations	Approved for 2015-16	Actuals for 2015-16	Approved in Truing up for 2015-16
1	Ukai (1-5)	75.00	41.56	41.56
2	Gandhinagar (1-4)	79.00	22.67	22.67
3	Wanakbori 1-6 TPS	85.00	41.58	41.58
4	Sikka TPS	71.00	15.99	15.99
5	KLTPS 1-3	75.00	68.00	68.00
6	KLTPS 4	75.00	48.96	48.96
7	Dhuvaran CCPP 2	80.00	32.94	32.94
8	Ukai Hydro	13.00	18.55	18.55
9	Kadana Hydro	6.00	13.39	13.39
10	Ukai Extn. 6*	85.00	55.83	55.83
11	Gandhinagar 5*	85.00	76.84	76.84
12	Wanakbori 7 TPS*	85.00	58.57	58.57
13	Sikka Extn. (3-4)*	85.00	31.36	31.36
14	Dhuvaran CCPP 1*	80.00	9.78	9.78
15	Dhuvaran CCPP 3*	85.00	0.00	0.00
16	Utran (Gas)*	80.00	0.00	0.00
17	Utran Extension*	80.00	38.66	38.66

* PPA based stations

4.2.3 Auxiliary Consumption

Petitioner's Submission

GSECL has submitted the actual auxiliary consumption of different stations for FY 2015-16. The auxiliary consumption (i) approved in the MYT order dated 11th April, 2011 and (ii) the actuals as furnished by GSECL in the petition for the period are given in Table below:

Table 4.7: Auxiliary consumption for FY 2015-16

(in %)

Sr. No.	Power stations	Approved for 2015-16	Actuals for 2015-16
1	Ukai (1-5)	9.00	9.48
2	Gandhinagar (1-4)	10.00	11.43
3	Wanakbori 1-6 TPS	9.00	9.14



Sr. No.	Power stations	Approved for 2015-16	Actuals for 2015-16
4	Sikka TPS	11.00	13.92
5	KLTPS 1-3	12.00	12.64
6	KLTPS 4	12.00	21.39
7	Dhuvaran CCPP 2	3.00	4.89
8	Ukai Hydro	0.70	0.58
9	Kadana Hydro	1.19	3.84
10	Ukai Extn. 6*	6.00	6.61
11	Gandhinagar 5*	9.00	9.91
12	Wanakbori 7 TPS*	9.00	9.74
13	Sikka Extn. (3-4)*	9.00	12.16
14	Dhuvaran CCPP 1*	3.00	10.36
15	Dhuvaran CCPP 3*	3.00	0.00
16	Utran (Gas)*	4.00	0.00
17	Utran Extension*	3.00	2.70

* PPA based stations

GSECL stated that the old stations, when operated at part load capacities under the constraints as explained below, consume more auxiliary power, resulting in higher auxiliary consumption. Following are the reasons for deviation in the auxiliary consumption for the stations where auxiliary consumption is high during FY 2015-16.

- Partial load operation due to backing down in case of Ukai 1-5, Ukai 6, Gandhinagar 1-4, Gandhinagar 5, Wanakbori 1-6, Wanakbori 7, Sikka 1-2, Dhuvaran CCPP 1 and Dhuvaran CCPP 2.
- **Sikka Extn 3-4:** Unit No. 3 & 4 were declared under Commercial operation from 14.09.2016 & 28.12.2016 respectively and were under stabilization phase.
- **KLTPS 1-3:** KLTPS Unit No. 3 of 75 MW was running at 50-55 MW due to problem in rotary APH baskets. The replacement of damaged APH baskets was completed during the planned outage of unit from 13.07.2015 to 10.08.2015. After commissioning of the unit with newly replaced APH baskets, rated load of 75 MW has been achieved on this unit. Further, the unit was also under forced outage.
- **KLTPS 4:** The load on unit was restricted to 48-50 MW due to problem of tubular APH blocks, which have been replaced during the outage of unit from 12.08.2015 to 05.10.2015. Thereafter the rated load on unit was achieved. Apart from the reasons mentioned above, increased auxiliary consumption is also due to design APC of more than 16% & due to forced outages.



- **Kadana Hydro:** The units are available but operated as per Irrigation department requirement

The petitioner also submitted that over and above backing down, the units frequently undergo reserve shut down and during the same, minimum auxiliaries are required to be run to keep the units available so that the same can be taken on grid as & when required by SLDC / system.

Commission's Analysis

The Commission has taken note of the submissions made by the petitioner with regard to the actual auxiliary consumption. The Commission observes that with regard to PPA governed stations, the auxiliary consumption is based on the respective PPAs and accordingly, the auxiliary consumption as considered in the respective Order for FY 2015-16. The actual auxiliary consumption in all plants is higher than approved in the respective Order for FY 2015-16 except for Ukai Hydro and Utran Extn. where the actual auxiliary consumption is less than what was considered.

The additional power consumption for Dhuvaran CCPP 1 is approved as per additional data of energy consumption by gas booster submitted by the petitioner vide e-mail dated 13th January, 2017. For other plants, though GSECL has indicated the reasons in its petition for the higher auxiliary consumption, the Commission is of the opinion that the reasons are not acceptable as the Commission had taken all the factors into consideration while approving auxiliary consumption in the respective order for FY 2015-16, and the auxiliary consumption is also a controllable parameter as described in the GERC (MYT) Regulations, 2011.

The Commission approves the auxiliary consumption for various stations as approved in the respective order for FY 2015-16, for truing up purpose as it is a controllable parameter. In the case of Dhuvran CCPP 1 where gas boosters are installed, additional auxiliary consumption as per actuals is allowed for the consumption of the gas booster.

The auxiliary consumption approved for different stations for the purpose of truing up for FY 2015-16 are as given in the Table below:



Table 4.8: Auxiliary consumption (%) approved for FY 2015-16 for truing up

(in %)				
Sr. No.	Power stations	Approved for 2015-16	Actuals for 2015-16	Approved in Truing up 2015-16
1	Ukai (1-5)	9.00	9.48	9.00
2	Gandhinagar (1-4)	10.00	11.43	10.00
3	Wanakbori 1-6 TPS	9.00	9.14	9.00
4	Sikka TPS	11.00	13.92	11.00
5	KLTPS 1-3	12.00	12.64	12.00
6	KLTPS 4	12.00	21.39	12.00
7	Dhuvaran CCPP 2	3.00	4.89	3.00
8	Ukai Hydro	0.70	0.58	0.70
9	Kadana Hydro	1.19	3.84	1.19
10	Ukai Extn. 6*	6.00	6.61	6.00
11	Gandhinagar 5*	9.00	9.91	9.00
12	Wanakbori 7 TPS*	9.00	9.74	9.00
13	Sikka Extn. (3-4)*	9.00	12.16	9.00
14	Dhuvaran CCPP 1*	3.00	10.36	3.00+0.77% (GBC)
15	Dhuvaran CCPP 3*	3.00	0.00	3.00
16	Utran (Gas)*	4.00	0.00	4.00
17	Utran Extension*	3.00	2.70	3.00

* PPA based stations

4.2.4 Station Heat Rate (SHR)

Petitioner's Submission

GSECL has furnished the actual SHR attained for different stations during FY 2015-16.

The station heat rates (i) approved by the Commission in the MYT order dated 11th April, 2011 and (ii) the actuals as furnished by GSECL in the petition are given in the Table below:



Table 4.9: Station Heat Rate for FY 2015-16

(Kcal/kWh)			
Sr. No.	Power stations	Approved for 2015-16	Actuals for 2015-16
1	Ukai (1-5)	2750	2738
2	Gandhinagar (1-4)	2782	2577
3	Wanakbori 1-6 TPS	2625	2693
4	Sikka TPS	3020	2914
5	KLTPS 1-3	3300	3085
6	KLTPS 4	3000	2909
7	Dhuvaran CCPP 2	1950	1957
8	Ukai Extn. 6*	2385	2507
9	Gandhinagar 5*	2460	2522
10	Wanakbori 7 TPS*	2460	2518
11	Sikka Extn. (3-4)*	2398	3238
12	Dhuvaran CCPP 1*	1950	2084
13	Dhuvaran CCPP 3*	1850	0
14	Utran (Gas)*	2150	0
15	Utran Extension*	1850	1726

* PPA based stations

GSECL has stated that for any generation plant, the SHR always deteriorates with the time. Hence, the old stations were not able to achieve the SHR comparable to the norms of the Commission. Further, as and when any unit operates on partial load, SHR increases drastically. GSECL has taken measures to improve SHR due to which some stations have shown considerable improvement.

GSECL stated the following reasons for exceeding the Station Heat Rate during FY 2015-16:

- Partial load operation due to Backing down in case of Ukai 6, Gandhinagar 5, Wanakbori 1-6, Wanakbori 7, Dhuvaran CCPP 1, Dhuvaran CCPP 2 and Utran Extension.
- Sikka Extn 3-4:** Unit No. 3 & 4 were declared under Commercial operation from 14.09.2016 & 28.12.2016 respectively and were under stabilization phase



Commission's Analysis

The Commission observes that for PPA governed stations, the SHR is approved as per the respective PPA terms.

Many of the plants have better heat rate than approved by the Commission. In the case of Sikka Extn. 3 & 4, the SHR is abnormally high for FY 2015-16. The Commission has analyzed the reasons submitted by the petitioner for these stations and is of the view that the reasons put forward are not acceptable because SHR is considered as controllable parameter for Truing up as prescribed in GERC (MYT) Regulations, 2011.

For the purpose of truing up for FY 2015-16, the Commission approves the SHR as considered in the respective order for FY 2015-16 as given in the Table below:

Table 4.10: Station Heat Rate approved for FY 2015-16 for truing up
(Kcal/kWh)

Sr. No.	Power stations	Approved for 2015-16	Actuals for 2015-16	Approved for Truing up of 2015-16
1	Ukai (1-5)	2750	2738	2750
2	Gandhinagar (1-4)	2782	2577	2782
3	Wanakbori 1-6 TPS	2625	2693	2625
4	Sikka TPS	3020	2914	3020
5	KLTPS 1-3	3300	3085	3300
6	KLTPS 4	3000	2909	3000
7	Dhuvaran CCPP 2	1950	1957	1950
8	Ukai Extn. 6*	2385	2507	2385
9	Gandhinagar 5*	2460	2522	2460
10	Wanakbori 7 TPS*	2460	2518	2460
11	Sikka Extn. (3-4)*	2398	3238	2398
12	Dhuvaran CCPP 1*	1950	2084	1950
13	Dhuvaran CCPP 3*	1850	0	1850
14	Utran (Gas)*	2150	0	2150
15	Utran Extension*	1850	1726	1850

* PPA based stations

4.2.5 Secondary Fuel Oil Consumption (Specific Oil Consumption)

Petitioner's Submission

GSECL has furnished the actual secondary fuel oil consumption for different stations during the FY 2015-16. The secondary fuel oil consumption (i) approved by the



Commission in the MYT order dated 11th April, 2011 and (ii) the actuals as furnished by GSECL in the petition for the period are given in Table below:

Table 4.11: Secondary Fuel Oil Consumption for FY 2015-16

(ml/kWh)			
Sr. No.	Power stations	Approved for 2015-16	Actuals for 2015-16
1	Ukai (1-5)	2.00	0.81
2	Gandhinagar (1-4)	1.50	1.40
3	Wanakbori 1-6 TPS	1.00	0.99
4	Sikka TPS	4.00	2.04
5	KLTPS 1-3	3.00	4.47
6	KLTPS 4	3.00	2.14
7	Ukai Extn. 6*	1.00	0.79
8	Gandhinagar 5*	3.50	0.18
9	Wanakbori 7 TPS*	3.50	0.59
10	Sikka Extn. (3-4)*	1.00	9.56

* PPA based stations

GSECL has submitted that the Specific Oil Consumption is calculated in terms of percentage of total calorific requirement of the power generating unit and has relation with the size of the generating unit. For the lower size units, the Specific Oil Consumption remains higher in comparison to the larger size units, because certain amount of Specific Oil consumption remains fixed irrespective of the size of the generating unit. As most of the units of GSECL power stations are smaller in size, Specific Oil Consumption of these plants is generally high.

GSECL has stated following reasons for higher specific oil consumption in respective stations for FY 2015-16:

- **Sikka Extn 3-4:** Unit No. 3 & 4 were declared under Commercial operation from 14.09.2016 & 28.12.2016 respectively and were under stabilization phase
- **KLTPS 1-3:** Forced outages

Commission's Analysis

For PPA governed stations, the secondary fuel oil consumption is approved as per the terms of the respective PPAs.

Except in case of Sikka Extn. 3 & 4 and for KLTPS 1-3, all other plants have much less SFO consumption. As submitted by GSECL, the high consumption of SFO in Sikka



Extn. 3 & 4 is due to regular start and shut down of the plant as the plant was in stabilization phase. For KLTPS 1-3, GSECL has submitted that the plant had undergone forced outages during FY 2015-16, hence SFO consumption is slightly higher than approved value.

The Commission has analyzed and noted the reasons submitted by GSECL for higher secondary oil consumption for above stations. However, as SFO consumption is a controllable parameter, for all non-PPA stations and for the purpose of truing up for FY 2015-16, the Commission approves the specific oil consumption as considered in the respective order for FY 2015-16.

Accordingly, the secondary fuel oil consumption approved for FY 2015-16 for various stations is as given in Table below:

Table 4.12: Secondary Fuel Oil Consumption approved for FY 2015-16 for Truing up
(ml/kWh)

Sr. No.	Power stations	Approved for 2015-16	Actuals for 2015-16	Approved for Truing up of 2015-16
1	Ukai (1-5)	2.00	0.81	2.00
2	Gandhinagar (1-4)	1.50	1.40	1.50
3	Wanakbori 1-6 TPS	1.00	0.99	1.00
4	Sikka TPS	4.00	2.04	4.00
5	KLTPS 1-3	3.00	4.47	3.00
6	KLTPS 4	3.00	2.14	3.00
7	Ukai Extn. 6*	1.00	0.79	1.00
8	Gandhinagar 5*	3.50	0.18	3.50
9	Wanakbori 7 TPS*	3.50	0.59	3.50
10	Sikka Extn. (3-4)*	1.00	9.56	1.00

* PPA based stations

4.2.6 Transit Loss

Petitioner's Submission

GSECL has furnished the actual transit loss of coal for different stations for the FY 2015-16.



The transit loss (i) approved by the Commission in the MYT order dated 11th April, 2011 and (ii) the actuals as furnished by GSECL in the petition for the period are given in the Table below:

Table 4.13: Transit Loss for FY 2015-16

(%)			
Sr. No.	Power stations	Approved for 2015-16	Actuals for 2015-16
1	Ukai (1-5)	0.80	1.08
2	Wanakbori 1-6 TPS	0.80	0.15
3	Gandhinagar (1-4)	0.80	0.14
4	Sikka TPS	0.80	0.28
5	KLTPS 1-3	0.20	0.20
6	KLTPS 4	0.20	0.20
7	Ukai Extn. 6*	0.80	0.24
8	Gandhinagar 5*	0.80	0.14
9	Wanakbori 7 TPS*	0.80	0.04
10	Sikka Extn. (3-4)*	0.80	0.00

* PPA based stations

Commission's Analysis

The transit loss as per actuals is less than that approved in the respective order for FY 2015-16 except Ukai (1-5) station. For the PPA governed stations, the transit loss is approved as per PPA terms. In case of Ukai 1-5, the transit loss is marginally more than that approved in the respective order for FY 2015-16.

The Commission approves the transit loss for all stations for truing up purpose for FY 2015-16 as given in the Table below:

Table 4.14: Transit Loss approved for FY 2015-16 for truing up

(%)				
Sr. No.	Power stations	Approved for 2015-16	Actuals for 2015-16	Approved for Truing up of 2015-16
1	Ukai (1-5)	0.80	1.08	0.80
2	Wanakbori 1-6 TPS	0.80	0.15	0.80
3	Gandhinagar (1-4)	0.80	0.14	0.80
4	Sikka TPS	0.80	0.28	0.80
5	KLTPS 1-3	0.20	0.20	0.20
6	KLTPS 4	0.20	0.20	0.20
7	Ukai Extn. 6*	0.80	0.24	0.80
8	Gandhinagar 5*	0.80	0.14	0.80
9	Wanakbori 7 TPS*	0.80	0.04	0.80
10	Sikka Extn. (3-4)*	0.80	0.00	0.00



* PPA based stations

The transit loss is considered only for indigenous coal, washed coal and lignite, but not for imported coal as mentioned in the GERC (MYT) Regulations, 2011.

4.2.7 Summary of Performance Parameters Approved for FY 2015-16

The performance parameters, approved for different stations for FY 2015-16 after the analysis in the preceding paras for the purpose of truing up for FY 2015-16, are listed in the Table below:

Table 4.15: Performance parameters approved for truing up purpose for the FY 2015-16

Sr. No.	Power stations	PAF (%)	PLF (%)	Auxiliary consumption (%)	SHR (Kcal/kWh)	SFO consumption (ml/kWh)	Transit loss (%)
1	Ukai (1-5)	75.00	41.56	9.00	2750	2.00	0.80
2	Gandhinagar (1-4)	79.00	22.67	10.00	2782	1.50	0.80
3	Wanakbori 1-6	85.00	41.58	9.00	2625	1.00	0.80
4	Sikka TPS	75.00	15.99	11.00	3020	4.00	0.80
5	KLTPS 1-3	75.00	68.00	12.00	3300	3.00	0.20
6	KLTPS 4	80.00	48.96	12.00	3000	3.00	0.20
7	Dhuvaran CCPP 2	85.00	32.94	3.00	1950	-	-
8	Ukai Hydro	80.00	18.55	0.70	-	-	-
9	Kadana Hydro	80.00	13.39	1.19	-	-	-
10	Ukai Extn. 6*	85.00	55.83	6.00	2385	1.00	0.80
11	Gandhinagar 5*	80.00	76.84	9.00	2460	3.50	0.80
12	Wanakbori 7*	80.00	58.57	9.00	2460	3.50	0.80
13	Sikka Extn.(3-4)*	85.00	31.36	9.00	2398	1.00	0.80
14	Dhuvaran CCPP 1*	80.00	9.78	3.00+0.77 % (GBC)	1950	-	-
15	Dhuvaran CCPP 3*	85.00	0.00	3.00	1850	-	-
16	Utran (Gas)*	80.00	0.00	4.00	2150	-	-
17	Utran Extn.*	80.00	38.66	3.00	1850	-	-

* PPA based stations

4.3 Gross and Net Generation

The gross and net generation of different stations, as per actual, as furnished by GSECL and as approved for truing up purpose for the FY 2015-16, are given in Table below:



Table 4.16: Gross and net generation for FY 2015-16 for truing up purpose

Sr. No.	Power stations	As per actuals submitted by GSECL				As approved by the Commission			
		Gross generation (MU)	Aux Cons. (%)	Aux. cons. (MU)	Net generation (MU)	Gross generation (MU)	Aux Cons. (%)	Aux. cons. (MU)	Net generation (MU)
1	Ukai (1-5)	3102.74	9.48	294.23	2808.51	3102.74	9.00	279.25	2823.49
2	Gandhinagar (1-4)	1314.42	11.43	150.20	1164.22	1314.42	10.00	131.44	1182.98
3	Wanakbori 1-6 TPS	4602.47	9.14	420.85	4181.62	4602.47	9.00	414.22	4188.25
4	Sikka TPS	337.10	13.92	46.92	290.18	337.10	11.00	37.08	300.02
5	KLTPS 1-3	1284.18	12.64	162.37	1121.81	1284.18	12.00	154.10	1130.08
6	KLTPS 4	322.52	21.39	68.98	253.54	322.52	12.00	38.70	283.82
7	Dhuvaran CCPP 2	325.33	4.89	15.92	309.41	325.33	3.00	9.76	315.57
8	Ukai Hydro	496.90	0.58	2.86	494.04	496.90	0.70	3.48	493.42
9	Kadana Hydro	284.55	3.84	10.92	273.63	284.55	1.19	3.39	281.16
10	Ukai Extn. 6*	2452.27	6.61	162.13	2290.14	2452.27	6.00	147.14	2305.13
11	Gandhinagar 5*	1417.49	9.91	140.50	1276.99	1417.49	9.00	127.57	1289.92
12	Wanakbori 7 TPS*	1080.47	9.74	105.26	975.21	1080.47	9.00	97.24	983.23
13	Sikka Extn. (3-4)*	555.11	12.16	67.48	487.63	555.11	9.00	49.96	505.15
14	Dhuvaran CCPP 1*	91.60	10.36	9.49	82.11	91.60	3.77%(GBC)	3.45	88.15
15	Dhuvaran CCPP 3*	0.00	0.00	0.00	0.00	0.00	3.00	0.00	0.00
16	Utran (Gas)*	0.00	0.00	0.00	0.00	0.00	4.00	0.00	0.00
17	Utran Extension*	1271.97	2.70	34.38	1237.59	1271.97	3.00	38.16	1233.81
	Total	18939.12		1692.49	17246.63	18939.12		1534.95	17404.2

* PPA based stations



4.4 Cost Parameters

The cost parameters include GCV of fuel, mix of fuel, and price of fuel. GSECL generating stations run on coal, lignite, oil, and gas as base fuel. For some coal based stations, a mix of indigenous, washed and imported coal is used.

GSECL has submitted the details of actual weighted average GCV, mix of coal and weighted average price of fuel for different stations as discussed below:

4.4.1 Wt. Av. Gross Calorific Value (GCV) of fuels

GSECL has furnished the actual Wt. Av. Gross Calorific Values of different fuels (as fed into the boiler in the case of usage of mix of coal) for FY 2015-16 as given in the Table below:

Table 4.17: Wt. Av. Gross Calorific Value (GCV) of fuels for different stations for FY 2015-16

Sr. No.	Power stations	Wt Av GCV of coal, lignite or mix of coal (Kcal/kg)	Wt Av GCV of Secondary fuel (Kcal/liter)	Wt Av GCV of gas (Kcal/SCM)
1	Ukai (1-5)	3902	10426	-
2	Gandhinagar (1-4)	3970	10427	-
3	Wanakbori 1-6 TPS	3851	10403	-
4	Sikka TPS	4137	10436	-
5	KLTPS 1-3	2837	10237	-
6	KLTPS 4	2841	10606	-
7	Dhuvaran CCPP 2	-	-	9564
8	Ukai Hydro	-	-	-
9	Kadana Hydro	-	-	-
10	Ukai Extn. 6*	3925	10423	-
11	Gandhinagar 5*	3968	10355	-
12	Wanakbori 7 TPS*	3909	10396	-
13	Sikka Extn. (3-4)*	5230	10250	-
14	Dhuvaran CCPP 1*	-	-	9581
15	Dhuvaran CCPP 3*	-	-	0
16	Utran (Gas)*	-	-	0
17	Utran Extension*	-	-	9549

* PPA based stations



4.4.2 Mix of Coal

GSECL has furnished the actual percentage of the mix of different types of coal used for the stations during the FY 2015-16 as given in Table below:

Table 4.18: The Mix of Different Types of Coal for FY 2015-16

Sr. No.	Power stations	Indigenous (%)	Washed (%)	Imported (%)
1	Ukai (1-5)	25%	70%	5%
2	Gandhinagar (1-4)	5%	90%	5%
3	Wanakbori 1-6 TPS	1%	97%	2%
4	Sikka TPS	0%	89%	11%
5	KLTPS 1-3	-	-	-
6	KLTPS 4	-	-	-
7	Ukai Extn. 6*	8%	88%	4%
8	Gandhinagar 5*	6%	89%	5%
9	Wanakbori 7 TPS*	2%	96%	2%
10	Sikka Extn. (3-4)*	0%	0%	100%

* PPA based stations

4.4.3 Wt. Av. Prices of Fuel

GSECL has furnished the actual Wt. Av. price per unit of different fuels for different stations, for FY 2015-16, as per the Table below:

Table 4.19: Wt. Av. Price / Unit of Fuels for 2015-16 (Actual)

Sr. No.	Power stations	Wt Av cost of indigenous coal (Rs./Mt)	Wt Av cost of washed coal (Rs./Mt)	Wt Av cost of imported coal (Rs./Mt)	Wt Av cost of lignite coal (Rs./Mt)	Wt Av cost of gas (Rs./S CM)	Wt Av cost of oil (Rs./KI)
1	Ukai (1-5)	3,407	3,701	6,227	-	-	33,170
2	Gandhinagar (1-4)	5,075	4,575	6,817	-	-	31,793
3	Wanakbori 1-6 TPS	5,650	4,615	6,750	-	-	31,022
4	Sikka TPS	-	5,603	3,409	-	-	34,658
5	KLTPS 1-3	-	-	-	1,072	-	28,419
6	KLTPS 4	-	-	-	1,088	-	44,459
7	Dhuvaran CCPP 2	-	-	-	-	19.26	-
8	Ukai Hydro	-	-	-	-	-	-
9	Kadana Hydro	-	-	-	-	-	-
10	Ukai Extn. 6*	3,527	3,820	6,222	-	-	32,950
11	Gandhinagar 5*	5,110	4,507	7,187	-	-	32,221
12	Wanakbori 7 TPS*	5,703	4,636	6,819	-	-	31,536
13	Sikka Extn. (3-4)*	-	-	4,819	-	-	23,936



Sr. No.	Power stations	Wt Av cost of indigenous coal (Rs./Mt)	Wt Av cost of washed coal (Rs./Mt)	Wt Av cost of imported coal (Rs./Mt)	Wt Av cost of lignite coal (Rs./Mt)	Wt Av cost of gas (Rs./S CM)	Wt Av cost of oil (Rs./Kl)
14	Dhuvaran CCPP 1*	-	-	-	-	18.25	-
15	Dhuvaran CCPP 3*	-	-	-	-	-	-
16	Utran (Gas)*	-	-	-	-	-	-
17	Utran Extension*	-	-	-	-	21.73	-

* PPA based stations

The Commission, after due validation, approved the Wt. Av. GCVs of fuels, percentage of mix of coal and prices of fuel (actuals), as furnished by GSECL for truing up purpose for FY 2015-16 as they are uncontrollable items.

4.5 Fuel Costs

Based on the performance and cost parameters, the approved fuel costs for each of the stations for FY 2015-16 for truing up purpose, along with the actuals furnished by GSECL, are given in Table below:



Table 4.20: Fuel Cost of different stations for FY 2015-16 Truing up

Sr. No.	Power Station	As per Actuals furnished by GSECL				As Approved by the Commission			
		Gross Generation (MUs)	Net Generation (MUs)	Fuel cost (Rs. Cr.)	Fuel Cost per unit Net (Rs./kWh)	Gross Generation (MUs)	Net Generation (MUs)	Fuel cost (Rs. Cr.)	Fuel Cost per unit Net (Rs./kWh)
1	2	3	4	5	6=5/4	7	8	9	10=9/8
1	Ukai (1-5)	3102.74	2808.51	828.61	2.95	3102.74	2823.49	838.58	2.97
2	Gandhinagar (1-4)	1314.42	1164.22	406.35	3.49	1314.42	1182.98	441.31	3.73
3	Wanakbori 1-6 TPS	4602.47	4181.62	1,512.93	3.62	4602.47	4188.25	1484.32	3.54
4	Sikka TPS	337.10	290.18	129.18	4.45	337.10	300.02	135.86	4.53
5	KLTPS 1-3	1284.18	1121.81	163.81	1.46	1284.18	1130.08	169.61	1.50
6	KLTPS 4	322.52	253.54	38.71	1.53	322.52	283.82	40.95	1.44
7	Dhuvaran CCPP 2	325.33	309.41	128.18	4.14	325.33	315.57	127.72	4.05
8	Ukai Hydro	496.90	494.04	-	-	496.90	493.42	-	-
9	Kadana Hydro	284.55	273.63	-	-	284.55	281.16	-	-
10	Ukai Extn. 6*	2452.27	2290.14	614.67	2.68	2452.27	2305.13	589.18	2.56
11	Gandhinagar 5*	1417.49	1276.99	422.21	3.31	1417.49	1289.92	423.76	3.29
12	Wanakbori 7 TPS*	1080.47	975.21	328.99	3.37	1080.47	983.23	329.75	3.35
13	Sikka Extn. (3-4)*	555.11	487.63	173.30	3.55	555.11	505.15	123.45	2.44
14	Dhuvaran CCPP 1*	91.60	82.11	36.37	4.43	91.60	88.15	34.03	3.86
15	Dhuvaran CCPP 3*	0.00	0.00	0.24	-	0.00	0.00	-	-
16	Utran (Gas)*	0.00	0.00	0.05	-	0.00	0.00	-	-
17	Utran Extension*	1271.97	1237.59	499.53	4.04	1271.97	1233.81	535.42	4.34
	Total	18939.12	17246.63	5283.13	3.06	18939.12	17404.2	5273.95	3.03

* PPA based stations



The detailed calculations for each station for arriving at the above costs are given in Annexures 4.1 to 4.14.

4.5.1 Variation between Actual Costs and Approved Costs

The approved fuel costs, for most of the stations are more than actuals, as GSECL has done better in comparison to performance parameters approved by the Commission. The reasons for the actual fuel costs being less than the approved costs are discussed below:

- **Ukai (1-5):** The actual SHR (2738 kcal/kWh) and SFO (0.81 ml/kWh) consumption is better than the approved one (2782 kcal/kWh and 2.0 ml/kWh)
- **Gandhinagar 1-4:** The actual SHR (2577 kcal/kWh) is better than the approved one (2782 kcal/kWh).
- **Sikka TPS:** The actual SHR (2914 kcal/kWh) is better than the approved one (3020 kcal/kWh).
- **KLTPS (1-3):** The actual SHR (3085 kcal/kWh) is better than the approved one (3300 kcal/kWh).
- **Utran extension:** The actual SHR (1726 kcal/kWh) is better than the approved one (1850 kcal/kWh)

The comparison between the fuel costs of all stations put together as per audited annual accounts for FY 2015-16 and the cost approved for truing up purpose is given in Table below:

Table 4.21: Cost of different fuels as per audited annual accounts and as approved for Truing up for FY 2015-16

(Rs. Crore)		
Item	Cost as per annual accounts	Cost as approved
Total Fuel Cost	5283.13	5273.95

The station-wise fuel costs are not provided in the audited annual accounts. The Commission has taken note of the submission made by GSECL, but for truing up purpose, the Commission has considered the fuel cost as computed, based on the approved performance parameters.



4.5.2 Gains and Losses in fuel costs due to controllable factors

Petitioner's Submission

GSECL has submitted that it has derived fuel expenses, considering performance parameters, such as auxiliary consumption, station heat rate, specific oil consumption and transit loss, as approved in the MYT Order dated 11th April, 2011 for truing up for FY 2015-16 and considering the actual fuel-related parameters, such as GCV of fuel and price of fuels, etc. For new generating stations namely Ukai-6, Sikka 3-4 and Dhuvaran CCPP 3, the approved values as per the Commission's True-up order for FY 2013-14 and tariff determination for FY 2015-16, dated 31st March, 2015 and order on Petition No. 1508/2015 dated 10th February, 2016, have been considered.

The fuel expenses so derived have been compared with the fuel expenses actually incurred with actual performance parameters of GSCEL for identification of the gain / (loss) on account of efficiency of these performance parameters. Thus, based on the same, GSECL's gain / (loss) is Rs.30.59 Crore in fuel expenses on account of operational efficiencies during FY 2015-16. The same is to be treated appropriately in line with the provisions of the GERC (MYT) Regulations, 2011/2016.

Commission's Analysis

The Commission has compared the fuel expenses so derived by GSECL with the fuel expenses arrived considering the now approved operational performance parameters for identification of gains / (losses) on account of variation in these parameters. The Commission accordingly approves the station-wise gains / losses for non-PPA stations as given in Table below:

Table 4.22: Approved Gains / (losses) from Fuel Expenses for FY 2015-16

(Rs. Crore)				
Sr. No.	Power Station	Actual Fuel cost	Fuel cost arrived with approved parameters for actual net generation for 2015-16	Gains / (losses) due to controllable factors
1	Ukai (1-5)	828.61	834.13	5.52
2	Gandhinagar (1-4)	406.35	434.31	27.96
3	Wanakbori 1-6 TPS	1,512.93	1,481.98	(30.96)
4	Sikka TPS	129.18	131.40	2.22
5	KLTPS 1-3	163.81	168.37	4.56
6	KLTPS 4	38.71	36.59	(2.12)
7	Dhuvaran CCPP 2	128.18	125.23	(2.95)



Sr. No.	Power Station	Actual Fuel cost	Fuel cost arrived with approved parameters for actual net generation for 2015-16	Gains / (losses) due to controllable factors
8	Ukai Hydro	-	-	
9	Kadana Hydro	-	-	
10	Ukai Extn. 6*	614.67	585.35	
11	Gandhinagar 5*	422.21	419.52	
12	Wanakbori 7 TPS*	328.99	327.06	
13	Sikka Extn. (3-4)*	173.30	119.17	
14	Dhuvaran CCPP 1*	36.37	31.70	
15	Dhuvaran CCPP 3*	0.24	0.24	
16	Utran (Gas)*	0.05	0.05	
17	Utran Extension*	499.53	537.06	
	Total	5,283.13	5,232.14	4.23

* PPA based stations

4.6 Fixed Charges

4.6.1 Depreciation for FY 2015-16

Petitioner's Submission

GSECL has claimed Rs. 904.76 Crore towards depreciation charges in the Truing up for FY 2015-16. The depreciation approved for FY 2015-16 by the Commission in the respective order and now claimed by GSECL are as given in the Table below

Table 4.23: Depreciation for FY 2015-16

(Rs. Crore)

Particulars	Approved for 2015-16	Claimed by GSECL for 2015-16
Depreciation	964.72	904.76

GSECL has proposed Rs. 79.01 Crore towards loss attributed to uncontrollable factors because of difference in the actual capitalization during FY 2015-16.

GSECL has mentioned that depreciation has been charged in accordance with the applicable GERC MYT Regulations. Petitioner has further mentioned that for GTPS 1-4, depreciation is charged higher as Unit 1 & 2 of the GTPS are phased out in



Septemebr, 2016. Balance depreciation for Ukai Hydro, up to 90% of GFA value, is charged in FY 2015-16 since the station has completed its useful life.

The station-wise depreciation claimed by GSECL as actual and the computation of gains / (losses) on account of controllable and uncontrollable factors are given in the Table below:

Table 4.24: Gains / Losses from Depreciation claimed for FY 2015-16

(Rs. Crore)

Sr. No.	Power Station	Depreciation (Approved)	Depreciation (Actual)	Gain / (Loss) due to controllable factor	Gain / (Loss) due to uncontrollable factor
1	Ukai (1-5)	74.88	72.09		2.79
2	Gandhinagar (1-4)	66.38	117.16		(50.78)
3	Wanakbori 1-6 TPS	107.05	101.88		5.17
4	Sikka TPS	30.50	33.90		(3.40)
5	KLTPS 1-3	60.10	66.30		(6.20)
6	KLTPS 4	35.17	35.50		(0.33)
7	Dhuvaran CCPP 2	21.64	20.04		1.60
8	Ukai Hydro	7.42	32.18		(24.76)
9	Kadana Hydro	15.07	18.18		(3.11)
10	Ukai Extn. 6*	123.00	147.15		-
11	Gandhinagar 5*	32.70	1.79		-
12	Wanakbori 7 TPS*	31.75	1.59		-
13	Sikka Extn. (3-4)*	159.14	68.28		-
14	Dhuvaran CCPP 1*	16.50	19.00		-
15	Dhuvaran CCPP 3*	83.16	79.53		-
16	Utran (Gas)*	20.70	24.00		-
17	Utran Extension*	79.56	66.18		-
	Total	964.72	904.76		(79.01)

* PPA based stations

Commission's Analysis

The Commission has noted from the audited annual accounts FY 2015-16 that the actual depreciation is Rs. 916.07 Crore as per P&L account, out of which Rs. 11.32 Crore is due to RE related assets. It is found that GSECL has claimed higher depreciation rate for Ukai Hydro and Gandhinagar 1-4 than the average depreciation



rate due to decommissioning of GTPS Unit 1&2 and completion of useful life of Ukai Hydro.

The Commission has computed the depreciation for all the stations, including Ukai Hydro station, taking into consideration the closing GFA of FY 2014-15 as the opening GFA for FY 2015-16, and adding the assets capitalized during FY 2015-16, adopting the actual weighted average rate of depreciation of FY 2011-12 as considered in the truing up for FY 2011-12 in the tariff order dated 30th March, 2013 (except GTPS 5 and Wanakbori 7, since the assets of these two stations have been depreciated up to 90% of its GFA value). The depreciation on the asset additions is allowed for these two stations. For GTPS 1-4, higher depreciation is not allowed by the Commission on account of retirement of GTPS 1-2. The balance depreciation out of 90% of GFA of GTPS 1 & 2 is to be adjusted against the sale proceeds of retired assets of these two units and to be claimed in true-up of the respective Financial Years in which these assets are sold.

Depreciation for Sikka 3 & 4 and Dhuvaran CCPP 3 is not computed by the Commission in the truing up of FY 2015-16 since the capital costs of these two stations are yet to be approved by the Commission.

Gains / Losses

As per GERC (MYT) Regulations, 2011, depreciation is considered to be a controllable expense. However, the Commission is of the view that the amount of depreciation is dependent on the quantum of capitalization, rate of depreciation, and disposal of existing assets, if any. The Commission is, therefore, of the view that the parameters that impact depreciation should be treated as uncontrollable. The loss calculated for non-PPA plants is Rs. 4.03 Crore.

GSECL has not claimed any gain / (loss) in respect of PPA governed stations.

The Commission, accordingly approves the station-wise depreciation charges and the gain / (loss) on account of depreciation in the Truing up for FY 2015-16 as detailed in the Table below:



Table 4.25: Approved station-wise depreciation charges and gains/(losses) from Depreciation for FY 2015-16

(Rs. Crore)						
Sr. No.	Power Station	Depreciation (Approved)	Depreciation (Actual)	Depreciation approved in Truing up 2015-16	Gain / (Loss) due to controllable factor	Gain / (Loss) due to uncontrollable factor
1	Ukai (1-5)	74.88	72.09	74.08		0.80
2	Gandhinagar (1-4)	66.38	117.16	81.81		(15.43)
3	Wanakbori 1-6 TPS	107.05	101.88	89.19		17.86
4	Sikka TPS	30.50	33.90	33.03		(2.53)
5	KLTPS 1-3	60.10	66.30	64.61		(4.51)
6	KLTPS 4	35.17	35.50	35.71		(0.54)
7	Dhuvaran CCPP 2	21.64	20.04	20.12		1.52
8	Ukai Hydro	7.42	32.18	8.29		(0.87)
9	Kadana Hydro	15.07	18.18	15.40		(0.33)
	Sub Total A	418.21	497.22	422.24		(4.03)
10	Ukai Extn. 6*	123.00	147.15	144.72		
11	Gandhinagar 5*	32.70	1.79	1.79		
12	Wanakbori 7 TPS*	31.75	1.59	1.59		
13	Sikka Extn. (3-4)*	-	-	-		
14	Dhuvaran CCPP 1*	16.50	19.00	18.76		
15	Dhuvaran CCPP 3*	-	-	-		
16	Utran (Gas)*	20.70	24.00	23.49		
17	Utran Extension*	79.56	66.18	65.55		
	Sub Total B	304.21	259.71	255.88		
	Total (A+B)	722.42	756.93	678.12		(4.03)

* PPA based stations

4.6.2 Interest and Finance charges for FY 2015-16

Petitioner's Submission

GSECL has claimed Rs. 509.21 Crore towards interest and finance charges in the Truing up for FY 2015-16. The interest and finance charges, approved for FY 2015-16 by the Commission in the respective order, and now claimed by GSECL as actual, are tabulated in Table below:



Table 4.26: Interest and Finance Charges claimed in truing up for FY 2015-16

(Rs. Crore)

Particulars	Approved for 2015-16	Claimed by GSECL 2015-16
Interest and Finance charges	774.42	509.21

GSECL submitted that the Commission has not considered the normative loan for Dhuvaran CCPP – 2 & only actual loan from PFC was considered. While making the balance payment, GSECL has availed a loan of Rs. 100 Crore from Union Bank of India (UBI). The same was not considered by the Commission from FY 2012-13 and GSECL requested the Commission to consider the same in FY 2015-16 to enable it to service the debt.

In addition, to reduce the interest cost for the loan period for Utran Extension GSECL had earlier incurred an expense of Rs. 48.60 Crores towards pre-payment charges paid to REC for swapping of loan with commercial banks at a cheaper rate. However, the Commission in its Tariff order dated 30th March, 2013 did not consider the claim stating that detailed information on net savings was not provided by GSECL. The Commission, on submission of details, agreed to consider this claim vide letter dated 30th March, 2013 after prudence check in the true-up and tariff order. Accordingly, GSECL requested the Commission to consider the same in the Tariff order for FY 2017-18.

GSECL has claimed Rs.149.10 Crore towards gain attributed to uncontrollable factor owing to the difference in the actual capitalization. The station-wise interest and finance charges claimed by GSECL in the truing for FY 2015-16 and the gains / losses are given in the table below:

Table 4.27: Gains / Losses from Interest & Finance charges claimed for FY 2015-16

(Rs. Crore)

Sr. No.	Power Station	Interest & Finance charges (Approved)	Interest & Finance charges (Actual)	Gain / (Loss) due to controllable factor	Gain / (Loss) due to uncontrollable factor
1	Ukai (1-5)	61.56	7.11		54.45
2	Gandhinagar (1-4)	12.39	3.12		9.27
3	Wanakbori 1-6 TPS	68.94	1.16		67.78
4	Sikka TPS	3.91	0.00		3.91
5	KLTPS 1-3	15.05	0.19		14.86



Sr. No.	Power Station	Interest & Finance charges (Approved)	Interest & Finance charges (Actual)	Gain / (Loss) due to controllable factor	Gain / (Loss) due to uncontrollable factor
6	KLTPS 4	27.19	26.59		0.60
7	Dhuvaran CCPP 2	3.54	9.62		(6.08)
8	Ukai Hydro	2.40	0.22		2.18
9	Kadana Hydro	2.12	0.00		2.12
10	Ukai Extn. 6*	182.12	179.54		
11	Gandhinagar 5*	-	-		
12	Wanakbori 7 TPS*	-	-		
13	Sikka Extn. (3-4)*	213.17	110.86		
14	Dhuvaran CCPP 1*	3.94	0.00		
15	Dhuvaran CCPP 3*	102.66	111.32		
16	Utran (Gas)*	5.22	0.00		
17	Utran Extension*	70.21	59.49		
	Total	774.42	509.21		149.10

* PPA based stations

Commission's Analysis

Commission has obtained the audited annual accounts of GSECL for FY 2015-16 as well as loans outstanding and the rate of interest for different stations. During examination it was found that there is a difference in opening loan considered by GSECL and that considered by Commission. Commission has considered the closing loan of 2014-15 as opening loan for 2015-16 and repayment is considered to be the depreciation approved by Commission. For the stations for which depreciation allowed is lower than the opening GFA plus addition in GFA during FY 2015-16 and for the stations for which depreciation is higher than opening GFA plus addition in GFA for FY 2015-16, lower amount of these two is considered for repayment as depreciation of asset cannot be more than closing GFA making closing GFA a negative figure. The weighted average rate of interest is considered as 10.49% as per the data provided by GSECL in additional submissions. Further, the Commission has considered the plea of GSECL to consider opening loan of Rs. 100 Crore in respect of Dhuvaran CCPP 2 and pre payment premium of Rs. 48.60 Crore for swapping of higher cost debt with low cost debt with respect to Utran extension.



Interest and Finance charges for Sikka 3 & 4 and Dhuvaran CCPP 3 are not computed by the commission in the truing up of FY 2015-16 since the capital costs of these two stations are yet to be approved by the Commission.

Gains / Losses

The GERC (MYT) Regulations, 2011 consider variation in interest rates as an uncontrollable parameter but variation in Interest and Finance charges as controllable. However, the Commission is of the view that amount of interest and finance charges are dependent on the quantum of capitalization, and the extent of borrowing considered during the financial year. The Commission is, therefore, of the view that the parameters which impact interest and finance charges should be treated as uncontrollable.

GSECL has not claimed any gain / (loss) in respect of PPA governed stations.

The Commission, accordingly approves the station-wise interest and finance charges and the gain / (loss) on account of interest and finance charges in the Truing up for FY 2015-16 as detailed in the Table below:

Table 4.28: Approved interest and finance charges and gain / (loss) for FY 2015-16

(Rs. Crore)

Sr. No.	Power Station	Interest & Finance charges (Approved)	Interest & Finance charges (Actual)	Interest & Finance charges approved in Truing up	Gain / (Loss) due to controllable factor	Gain / (Loss) due to uncontrollable factor
1	Ukai (1-5)	61.56	7.11	22.04		39.52
2	Gandhinagar (1-4)	12.39	3.12	25.99		(13.60)
3	Wanakbori 1-6 TPS	68.94	1.16	20.94		48.00
4	Sikka TPS	3.91	0.00	3.98		(0.07)
5	KLTPS 1-3	15.05	0.19	11.11		3.94
6	KLTPS 4	27.19	26.59	27.62		(0.43)
7	Dhuvaran CCPP 2	3.54	9.62	12.28		(8.74)
8	Ukai Hydro	2.40	0.22	3.03		(0.63)
9	Kadana Hydro	2.12	0.00	1.00		1.12
	Subtotal A	197.10	48.00	127.99		69.11
10	Ukai Extn. 6*	182.12	179.54	182.04		
11	Gandhinagar 5*	-	-	0.00		
12	Wanakbori 7 TPS*	-	-	0.00		



Sr. No.	Power Station	Interest & Finance charges (Approved)	Interest & Finance charges (Actual)	Interest & Finance charges approved in Truing up	Gain / (Loss) due to controllable factor	Gain / (Loss) due to uncontrollable factor
13	Sikka Extn. (3-4)*	-	-	-		
14	Dhuvaran CCPP 1*	3.94	0.00	0.00		
15	Dhuvaran CCPP 3*	-	-	-		
16	Utran (Gas)*	5.22	0.00	0.00		
17	Utran Extension*	70.21	59.49	117.99		
	Subtotal B	261.49	239.03	300.03		
	Total (A+B)	458.59	287.03	428.03		69.11

* PPA based stations

4.6.3 Return on Equity for FY 2015-16

Petitioner's Submission

GSECL has claimed Rs. 680.45 Crore towards RoE in the Truing up for FY 2015-16. The RoE approved for FY 2015-16 by the Commission in the March, 2015 Tariff Order for FY 2015-16, and now claimed by GSECL as actual are given in Table below:

Table 4.29: Return on Equity for FY 2015-16

(Rs. Crore)		
Particulars	Approved for 2015-16	Claimed by GSECL for 2015-16
Return on Equity	724.53	680.45

GSECL has submitted that the comparison of actual value for return on equity, computed on the basis of opening equity for FY 2015-16 and addition to equity during the year on account of funding of capital expenditure, against the return on equity approved in the respective order for FY 2015-16 resulted in a loss of Rs. 8.87 Crore. This variation of Rs. 8.87 Crore has been attributed to uncontrollable factors. The station-wise RoE claimed by GSECL in the truing for FY 2015-16 and the controllable gains / (losses) are given in the Table below:



Table 4.30: Gains / Losses from Return on equity claimed for FY 2015-16

(Rs. Crore)

Sr. No.	Power Station	Return on equity (Approved)	Return on equity (Claimed)	Gain / (Loss) due to controllable factor	Gain / (Loss) due to uncontrollable factor
1	Ukai (1-5)	33.67	27.64		6.03
2	Gandhinagar (1-4)	30.66	40.77		(10.11)
3	Wanakbori 1-6 TPS	68.81	64.24		4.57
4	Sikka TPS	20.44	22.94		(2.50)
5	KLTPS 1-3	43.68	47.52		(3.84)
6	KLTPS 4	28.42	28.70		(0.28)
7	Dhuvaran CCPP 2	15.40	16.11		(0.71)
8	Ukai Hydro	8.12	9.78		(1.66)
9	Kadana Hydro	28.00	28.37		(0.37)
10	Ukai Extn. 6*	121.84	127.66		
11	Gandhinagar 5*	26.78	26.86		
12	Wanakbori 7 TPS*	26.00	26.05		
13	Sikka Extn. (3-4)*	126.59	68.77		
14	Dhuvaran CCPP 1*	12.87	11.17		
15	Dhuvaran CCPP 3*	66.15	65.70		
16	Utran (Gas)*	10.40	10.94		
17	Utran Extension*	56.70	57.23		
	Total	724.53	680.45		(8.87)

* PPA based stations

Commission's Analysis

The Commission has observed that GSECL has compared the actual RoE of Rs. 680.45 Crore for FY 2015-16 with the RoE considered in the respective order for FY 2015-16 and arrived at a loss of Rs. 8.87 Crore. The RoE approved for FY 2015-16 was Rs. 724.53 Crore and has resulted in a gain of Rs. 3.98 Crore but not a loss of Rs. 8.87 Crore as mentioned by GSECL. The Commission has taken the closing equity of FY 2014-15 as the opening equity of FY 2015-16. Furthermore, the Commission has negated the RoE due to PSDF Scheme for two plants namely Utran Extn. and Dhuvaran CCPP 2, as the PSDF Scheme mandated the generator to forgo the RoE. Thus, it has resulted in a gain of Rs. 3.98 Crore.



Return on Equity for Sikka 3 & 4 and Dhuvaran CCPP 3 is not computed by the Commission in the truing up of FY 2015-16 since the capital costs of these two stations are yet to be approved by the Commission.

Gains / (Losses)

The GERC (MYT) Regulations, 2011 considers the parameters impacting the variance in the return on equity as controllable. However, the Commission is of the view that the return on equity depends on the amount of capitalisation and the debt equity ratio considered during the financial year, and these parameters are uncontrollable in nature. The variance in the amount of return on equity is therefore treated as uncontrollable.

The Commission, accordingly approves the station-wise return on equity and gain / (loss) on account of return on equity in the truing up for FY 2015-16 as detailed in the Table below:

Table 4.31: Approved return on equity and gain / (loss) for FY 2015-16

(Rs. Crore)						
Sr. No.	Power Station	Return on equity (Approved)	ROE (Claimed)	ROE approved for Truing up	Gain / (Loss) due to controllable factor	Gain / (Loss) due to uncontrollable factor
1	Ukai (1-5)	33.67	27.64	27.35		6.32
2	Gandhinagar (1-4)	30.66	40.77	38.50		(7.84)
3	Wanakbori 1-6 TPS	68.81	64.24	63.85		4.96
4	Sikka TPS	20.44	22.94	22.89		(2.45)
5	KLTPS 1-3	43.68	47.52	47.47		(3.79)
6	KLTPS 4	28.42	28.70	28.76		(0.34)
7	Dhuvaran CCPP 2	15.40	16.11	6.24 [#]		9.16
8	Ukai Hydro	8.12	9.78	9.77		(1.65)
9	Kadana Hydro	28.00	28.37	28.40		(0.40)
	Subtotal A	277.20	286.07	273.22		3.98
10	Ukai Extn. 6*	121.84	127.66	122.05		
11	Gandhinagar 5*	26.78	26.86	28.67		
12	Wanakbori 7 TPS*	26.00	26.05	26.02		
13	Sikka Extn. (3-4)*	-	-	-		
14	Dhuvaran CCPP 1*	12.87	11.17	10.25		
15	Dhuvaran CCPP 3*	-	-	-		



Sr. No.	Power Station	Return on equity (Approved)	ROE (Claimed)	ROE approved for Truing up	Gain / (Loss) due to controllable factor	Gain / (Loss) due to uncontrollable factor
16	Utran (Gas)*	10.40	10.94	10.94		
17	Utran Extension*	56.70	57.23	10.08 [#]		
	Subtotal B	254.59	259.91	208.03		
	Total (A+B)	531.79	545.98	481.24		3.98

* PPA based stations

[#] ROE reduced after considering the period for which stations operated under PSDF scheme of GoI.

4.6.4 O&M Expenses for FY 2015-16

Petitioner's Submission

GSECL has claimed Rs. 841.72 Crore towards actual O&M expenses in the Truing up for FY 2015-16. GSECL has submitted that these O&M expenses include 7th Pay Commission provision of Rs. 27.6 Crore. The O&M charges approved for FY 2015-16 by the Commission in the respective order, and now claimed by GSECL are as given in Table below:

Table 4.32: O&M expenses for FY 2015-16

(Rs. Crore)		
Particulars	Approved for 2015-16	Claimed by GSECL (Truing up) 2015-16
O&M expenses	1044.51	841.72

GSECL has categorized O&M expenses as controllable. GSECL has indicated a net loss of Rs. 11.14 Crore. The station-wise O&M expenses claimed by GSECL in the truing for FY 2015-16 and the controllable gains / losses are given in the table below:



Table 4.33: Gains / Losses from O&M expenses for FY 2015-16

(Rs. Crore)

Sr. No.	Power Station	O&M expenses (Approved)	O&M expenses (Actual)	Gain / (Loss) due to controllable factor	Gain / (Loss) due to uncontrollable factor
1	Ukai (1-5)	160.99	160.93	0.06	
2	Gandhinagar (1-4)	114.02	98.60	15.42	
3	Wanakbori 1-6 TPS	164.74	179.55	(14.81)	
4	Sikka TPS	57.75	58.55	(0.80)	
5	KLTPS 1-3	90.53	98.66	(8.13)	
6	KLTPS 4	20.27	16.18	4.09	
7	Dhuvaran CCPP 2	22.29	27.25	(4.96)	
8	Ukai Hydro	14.34	14.30	0.04	
9	Kadana Hydro	16.49	18.55	(2.06)	
10	Ukai Extn. 6*	77.14	32.13		
11	Gandhinagar 5*	29.00	25.31		
12	Wanakbori 7 TPS*	29.00	15.33		
13	Sikka Extn. (3-4)*	86.21	10.85		
14	Dhuvaran CCPP 1*	18.00	25.83		
15	Dhuvaran CCPP 3*	77.74	8.60		
16	Utran (Gas)*	15.00	9.08		
17	Utran Extension*	51.00	42.03		
	Total	1044.51	841.72	(11.15)	

* PPA based stations

Commission's Analysis

The Commission has observed that the actual O&M expenses, as per the audited accounts for FY 2015-16, are Rs. 898.18 Crore. The Commission noticed that GSECL has negated the O & M expenses of Rs. 56.45 Crore related to SSNL and RE assets to arrive at O&M expenses of Rs. 841.73 Crore. Further, since the amount of Rs. 27.6 Crore pertaining to 7th Pay Commission is not actually paid to employees by GSECL yet, the Commission does not consider it as actual expense for FY 2015-16. GSECL has claimed CSR expense of Rs. 4.27 Crore as O&M expense which has to be borne by them. Accordingly, the Commission approves O&M expense at Rs. 791.36 Crore for FY 2015-16.

O&M expenses for Sikka 3 & 4 and Dhuvaran CCPP 3 are not computed by the Commission in the truing up of FY 2015-16 since the capital costs of these two stations are yet to be approved by the Commission.



Gains / (Loss)

The Commission observed that GSECL has computed the losses of Rs. 11.15 Crore due to controllable factors by comparing the actual amount with O&M expenses approved by Commission.

The Commission, approves the station-wise O&M expenses and the gains / (loss) on account of O&M expenses in the truing up for FY 2015-16 as detailed in the Table below:

Table 4.34: Approved O&M expenses gains / losses for FY 2015-16

(Rs. Crore)						
Sr. No.	Power Station	O&M expenses (Approved)	O&M expenses (Actual)	O&M expenses Approved in Truing up	Gain / (Loss) due to controllable factor	Gain / (Loss) due to uncontrollable factor
1	Ukai (1-5)	160.99	160.93	154.06	6.93	
2	Gandhinagar (1-4)	114.02	98.60	94.32	19.70	
3	Wanakbori 1-6 TPS	164.74	179.55	172.98	(8.24)	
4	Sikka TPS	57.75	58.55	56.16	1.59	
5	KLTPS 1-3	90.53	98.66	95.69	(5.16)	
6	KLTPS 4	20.27	16.18	15.71	4.56	
7	Dhuvaran CCPP 2	22.29	27.25	26.33	(4.04)	
8	Ukai Hydro	14.34	14.30	13.69	0.65	
9	Kadana Hydro	16.49	18.55	17.75	(1.26)	
	Subtotal A	661.42	672.56	646.70	14.72	
10	Ukai Extn. 6*	77.14	32.13	31.03		
11	Gandhinagar 5*	29.00	25.31	24.21		
12	Wanakbori 7 TPS*	29.00	15.33	14.78		
13	Sikka Extn. (3-4)*	-	-	-		
14	Dhuvaran CCPP 1*	18.00	25.83	24.96		
15	Dhuvaran CCPP 3*	-	-	-		
16	Utran (Gas)*	15.00	9.08	8.73		
17	Utran Extension*	51.00	42.03	40.96		
	Subtotal B	219.14	149.71	144.67		
	Total (A+B)	880.56	822.27	791.36	14.72	

* PPA based stations

4.6.5 Interest on Working Capital for FY 2015-16

Petitioner's Submission

GSECL has claimed Rs. 417.96 Crore towards interest on working capital in the Truing up for FY 2015-16. The interest on working capital approved for FY 2015-16 in the



respective order and as claimed by GSECL in the Truing up are given in the Table below:

Table 4.35: Interest on Working Capital Claimed by GSECL in Truing up for FY 2015-16

(Rs. Crore)

Particulars	Approved for 2015-16	Claimed by GSECL (Truing up) 2015-16
Interest on working capital	253.80	417.96

GSECL has submitted that they have taken 14.75% (SBI PLR as on 01.04.2015) as the interest rate for calculating Working Capital interest charges. GSECL has further submitted that the Interest on Working Capital computed in the Truing up for FY 2015-16 indicates a loss of Rs. 128.45 Crore as shown in the Table below:

Table 4.36: Gains / Losses from Interest on working capital claimed for FY 2015-16

(Rs. Crore)

Sr. No.	Power Station	Interest on working capital (Approved)	Interest on working capital (Actual)	Gain / (Loss) due to controllable factor	Gain / (Loss) due to uncontrollable factor
1	Ukai (1-5)	27.40	55.93		(28.53)
2	Gandhinagar (1-4)	28.65	53.28		(24.63)
3	Wanakbori 1-6 TPS	52.24	107.74		(55.50)
4	Sikka TPS	9.31	22.95		(13.64)
5	KLTPS 1-3	12.08	12.54		(0.46)
6	KLTPS 4	9.08	5.33		3.75
7	Dhuvaran CCPP 2	3.13	10.85		(7.72)
8	Ukai Hydro	0.55	1.32		(0.77)
9	Kadana Hydro	1.10	2.04		(0.94)
10	Ukai Extn. 6*	28.92	44.02		
11	Gandhinagar 5*	9.35	16.74		
12	Wanakbori 7 TPS*	8.88	16.69		
13	Sikka Extn. (3-4)*	32.40	18.01		
14	Dhuvaran CCPP 1*	2.81	9.46		
15	Dhuvaran CCPP 3*	14.84	5.80		
16	Utran (Gas)*	3.28	1.90		
17	Utran Extension*	9.78	33.35		
	Total	253.80	417.96		(128.45)

* PPA based stations



Commission's Analysis

The Commission has examined the interest on working capital claimed by GSECL as per actuals. The Commission has observed that the working capital and the interest on working capital have been worked out as per the GERC Tariff Regulations, including maintenance spares, but since approved O&M costs, fuel costs, ARR and SFO cost in truing up of FY 2015-16 are different than those claimed by GSECL, Commission has calculated working capital based on approved values. Further, while allowing coal cost for working capital, the Commission has excluded the penalty for lower off-take paid by GSECL during FY 2015-16.

Regarding 1% Maintenance spares, Regulation 41.1 (a) (v) of GERC (MYT) Regulations, 2011, specifies maintenance spares as 1% of the historical cost, escalated at 6% from the date of commercial operation. However, the Commission has been considering the maintenance spares at 1% of the opening GFA for the respective year. The Commission has, therefore, considered maintenance spares at 1% of the opening GFA (Historical cost), since there has been substantial increase in the GFA year on year.

Interest on working capital for Sikka 3 & 4 and Dhuvaran CCPP 3 is not computed by the Commission in the truing up of FY 2015-16 since the capital costs of these two stations are yet to be approved by the Commission.

The interest on working capital is calculated at Rs.300.38 Crore based on the expenses approved in the truing up for FY 2015-16.



Gain / (Loss)

With regard to GSECL's submission that interest on working capital should be considered as uncontrollable, the Commission is also of the view that interest on working capital, being normative, should be considered as uncontrollable.

The Commission accordingly approves the station-wise Interest on Working Capital and the gains / (losses) on account of Interest on Working Capital in the truing up for FY 2015-16 as detailed in the Table below:

Table 4.37: Approved Gains / (Losses) from Interest on Working Capital for FY 2015-16

(Rs. Crore)

Sr. No.	Power Station	Approved for 2015-16	Claimed in truing up of 2015-16	Approved in truing up of 2015-16	Deviation +/-	Gain / (Loss) due to controllable factor	Gain / (Loss) due to uncontrollable factor
1	Ukai (1-5)	27.40	55.93	45.68			(18.28)
2	Gandhinagar (1-4)	28.65	53.28	39.61			(10.96)
3	Wanakbori 1-6 TPS	52.24	107.74	80.07			(27.83)
4	Sikka TPS	9.31	22.95	15.09			(5.78)
5	KLTPS 1-3	12.08	12.54	10.34			1.74
6	KLTPS 4	9.08	5.33	3.98			5.10
7	Dhuvaran CCPP 2	3.13	10.85	7.44			(4.31)
8	Ukai Hydro	0.55	1.32	0.80			(0.25)
9	Kadana Hydro	1.10	2.04	1.46			(0.36)
	Sub total A	143.54	271.99	204.48			(60.94)
10	Ukai Extn. 6*	28.92	44.02	34.40			
11	Gandhinagar 5*	9.35	16.74	15.21			
12	Wanakbori 7 TPS*	8.88	16.69	13.70			
13	Sikka Extn. (3-4)*	-	-	-			
14	Dhuvaran CCPP 1*	2.81	9.46	5.46			
15	Dhuvaran CCPP 3*	-	-	-			
16	Utran (Gas)*	3.28	1.90	1.23			
17	Utran Extension*	9.78	33.35	25.91			
	Sub total B	63.02	122.16	95.90			
	Total (A+B)	206.56	394.15	300.38			(60.94)

* PPA based stations



4.6.6 SLDC Charges for FY 2015-16

Petitioner's Submission

GSECL has claimed Rs.1.32 Crore towards SLDC charges in the Truing up for FY 2015-16.

The SLDC charges approved for FY 2015-16 by the Commission in the respective order for FY 2015-16, and now claimed by GSECL as actual are tabulated below:

Table 4.38: SLDC charges for FY 2015-16

(Rs. Crore)

Particulars	Approved for 2015-16	Claimed in Truing up for 2015-16
SLDC charges	3.07	1.32

GSECL has submitted that it has considered the Gains / (Losses) on account of SLDC charges as “uncontrollable” factors. The station wise SLDC charges claimed by GSECL in the Truing up for FY 2015-16 and the uncontrollable Gains / (Losses) are given in the Table below:

Table 4.39: Gain / (loss) for SLDC charges claimed for FY 2015-16

(Rs. Crore)

Sr. No.	Power Station	SLDC (Approved)	SLDC (Actual)	Gain / (Loss) due to controllable factor	Gain / (Loss) due to uncontrollable factor
1	Ukai (1-5)	0.46	0.19		0.27
2	Gandhinagar (1-4)	0.36	0.20		0.16
3	Wanakbori 1-6 TPS	0.68	0.31		0.37
4	Sikka TPS	0.13	0.06		0.07
5	KLTPS 1-3	0.12	0.06		0.06
6	KLTPS 4	0.04	0.01		0.03
7	Dhuvaran CCPP 2	0.06	0.03		0.03
8	Ukai Hydro	0.16	0.07		0.09
9	Kadana Hydro	0.13	0.06		0.07
10	Ukai Extn. 6*	-	0.12		
11	Gandhinagar 5*	0.11	0.00		
12	Wanakbori 7 TPS*	0.11	0.03		
13	Sikka Extn. (3-4)*	0.22	0.05		
14	Dhuvaran CCPP 1*	0.06	0.02		



Sr. No.	Power Station	SLDC (Approved)	SLDC (Actual)	Gain / (Loss) due to controllable factor	Gain / (Loss) due to uncontrollable factor
15	Dhuvaran CCPP 3*	0.16	0.00		
16	Utran (Gas)*	0.07	0.05		
17	Utran Extension*	0.20	0.07		
	Total	3.07	1.32		1.15

* PPA based stations

Commission's Analysis

The SLDC charges are not published separately in the annual accounts. On a query by the Commission, GSECL submitted that SLDC charges of Rs. 1.32 Crore are clubbed with A&G expenses. The Commission has therefore reduced this amount from A&G Expenses and dealt with SLDC charge separately.

SLDC charges for Sikka 3 & 4 and Dhuvaran CCPP 3 are not computed in the truing up of FY 2015-16 since the capital costs of these two stations are yet to be approved by the Commission.

The Commission, therefore, approves Rs. 1.27 Crore towards SLDC charges in the truing up for FY 2015-16 as claimed by GSECL against Rs. 3.07 Crore approved in the respective order for FY 2015-16.

Gains / (Losses):

The parameters, which impact SLDC charges, are uncontrollable. The Commission accordingly approves the Gains / (Losses) on account of SLDC charges in the Truing up as detailed in the Table below:

Table 4.40: Approved SLDC charges gains / (losses) for FY 2015-16

(Rs. Crore)							
Sr. No.	Power Station	Approved for 2015-16	Claimed in truing up of 2015-16	Approved in truing up of 2015-16	Deviation +/-	Gain / (Loss) due to controllable factor	Gain / (Loss) due to uncontrollable factor
1	Ukai (1-5)	0.46	0.19	0.19	0.27		0.27
2	Gandhinagar (1-4)	0.36	0.20	0.20	0.16		0.16
3	Wanakbori 1-6 TPS	0.68	0.31	0.31	0.37		0.37
4	Sikka TPS	0.13	0.06	0.06	0.07		0.07
5	KLTPS 1-3	0.12	0.06	0.06	0.06		0.06



Sr. No.	Power Station	Approved for 2015-16	Claimed in truing up of 2015-16	Approved in truing up of 2015-16	Deviation +/-	Gain / (Loss) due to controllable factor	Gain / (Loss) due to uncontrollable factor
6	KLTPS 4	0.04	0.01	0.01	0.03		0.03
7	Dhuvaran CCPP 2	0.06	0.03	0.03	0.03		0.03
8	Ukai Hydro	0.16	0.07	0.07	0.09		0.09
9	Kadana Hydro	0.13	0.06	0.06	0.07		0.07
	Sub Total A	2.14	0.99	0.99			1.15
10	Ukai Extn. 6*	-	0.12	0.12			
11	Gandhinagar 5*	0.11	0.00	0.00			
12	Wanakbori 7 TPS*	0.11	0.03	0.03			
13	Sikka Extn. (3-4)*	-	-	-			
14	Dhuvaran CCPP 1*	0.06	0.02	0.02			
15	Dhuvaran CCPP 3*	-	-	-			
16	Utran (Gas)*	0.07	0.05	0.05			
17	Utran Extension*	0.20	0.07	0.07			
	Sub Total B	0.71	0.28	0.28			
	Total (A+B)	2.85	1.27	1.27	1.15		1.15

* PPA based stations

4.6.7 Water charges for FY 2015-16

GSECL has claimed Rs. 75.77 Crore towards water charges in the Truing up for FY 2015-16 against Rs. 94.56 Crore approved in the respective Order. The water charges, approved for FY 2015-16 in the respective Order and claimed by GSECL, are given in the Table below:

Table 4.41: Water charges for FY 2015-16

(Rs. Crore)		
Particulars	Approved for 2015-16	Claimed in Truing up for 2015-16
Water charges	94.56	75.77

Petitioner's Submission

GSECL has submitted that it has considered the Gains / (Losses) on account of water charges as "uncontrollable" factors. The station wise water charges claimed by GSECL in the Truing up for FY 2015-16 and the uncontrollable Gains / (Losses) are given in the Table below:



Table 4.42: Gain / (loss) for Water charges claimed for FY 2015-16

(Rs. Crore)

Sr. No.	Power Station	Water Charges (Approved)	Water Charges (Actual)	Gain / (Loss) due to controllable factor	Gain / (Loss) due to uncontrollable factor
1	Ukai (1-5)	-	0.13		(0.13)
2	Gandhinagar (1-4)	30.47	11.01		19.46
3	Wanakbori 1-6 TPS	40.57	35.76		4.81
4	Sikka TPS	3.89	2.28		1.61
5	KLTPS 1-3	0.60	0.43		0.17
6	KLTPS 4	-	0.13		(0.13)
7	Dhuvaran CCPP 2	-	0.76		(0.76)
8	Ukai Hydro	-	-		-
9	Kadana Hydro	-	-		-
10	Ukai Extn. 6*	-	0.10		
11	Gandhinagar 5*	7.62	11.87		
12	Wanakbori 7 TPS*	7.12	8.18		
13	Sikka Extn. (3-4)*		1.19		
14	Dhuvaran CCPP 1*	-	0.21		
15	Dhuvaran CCPP 3*		-		
16	Utran (Gas)*	2.70	0.06		
17	Utran Extension*	1.59	3.64		
	Total	94.56	75.77		25.02

* PPA based stations

Commission's Analysis

The actual water charges station wise are given in the Appendix A of the petition. The actual water charges aggregate to Rs. 75.77 Crore for GSECL stations as against Rs. 94.56 Crore approved for FY 2015-16 in the respective Order for FY 2015-16. The water charges as per audited accounts are Rs. 75.77 Crore.

Water charges for Sikka 3 & 4 and Dhuvaran CCPP 3 are not computed by the Commission in the truing up of FY 2015-16 since the capital costs of these two stations are yet to be approved by the Commission.

The Commission therefore approves the water charges as claimed by GSECL excluding water charges for Sikka 3&4 and Dhuvaran CCPP 3.



Gains / (Losses):

As provided in the GERC (MYT) Regulations, 2011, as well as in the respective Order for FY 2015-16, the Commission is of the opinion that the water charges should be considered as per actuals. Accordingly, the Commission approves the Gains / (Losses) on account of water charges as uncontrollable in the Truing up as detailed in the Table below:

Table 4.43: Approved Water charges gain / (loss) for FY 2015-16

(Rs. Crore)

Sr. No.	Power Station	Approved for 2015-16	Claimed in truing up of 2015-16	Approved in truing up of 2015-16	Deviation +/-	Gain / (Loss) due to controllable factor	Gain / (Loss) due to uncontrollable factor
1	Ukai (1-5)	-	0.13	0.13	(0.13)		(0.13)
2	Gandhinagar (1-4)	30.47	11.01	11.01	19.46		19.46
3	Wanakbori 1-6 TPS	40.57	35.76	35.76	4.81		4.81
4	Sikka TPS	3.89	2.28	2.28	1.61		1.61
5	KLTPS 1-3	0.60	0.43	0.43	0.17		0.17
6	KLTPS 4	-	0.13	0.13	(0.13)		(0.13)
7	Dhuvaran CCPP 2	-	0.76	0.76	(0.76)		(0.76)
8	Ukai Hydro	-	-	-	-		-
9	Kadana Hydro	-	-	-	-		-
	Sub Total A	75.53	50.51	50.51			25.02
10	Ukai Extn. 6*	-	0.10	0.10			
11	Gandhinagar 5*	7.62	11.87	11.87			
12	Wanakbori 7 TPS*	7.12	8.18	8.18			
13	Sikka Extn. (3-4)*	-	-	-			
14	Dhuvaran CCPP 1*	-	-	-			
15	Dhuvaran CCPP 3*	-	-	-			
16	Utran (Gas)*	2.70	0.06	0.06			
17	Utran Extension*	1.59	3.64	3.64			
	Sub Total B	19.03	23.86	23.86			
	Total (A+B)	94.56	74.37	74.37	25.02		25.02

* PPA based stations



4.6.8 Income Tax for FY 2015-16

Petitioner's Submission

GSECL has claimed Rs. 41.08 Crore towards income tax in the Truing up for FY 2015-16. The income tax approved for FY 2015-16 by the Commission in the respective order, and now claimed by GSECL as actual are tabulated in Table below:

Table 4.44: Income Tax for FY 2015-16

(Rs. Crore)		
Particulars	Approved for 2015-16	Claimed in Truing up for 2015-16
Income Tax	49.37	41.08

GSECL has claimed tax of Rs. 41.08 Crore as against the approved tax of Rs. 49.37 Crore in respect of all stations. However, there is a loss of Rs. 8.52 Crore in respect of generating stations other than PPA governed stations and this is uncontrollable. The station wise details claimed by GSECL are given in the Table below:

Table 4.45: Gain / (loss) for Income Tax claimed for FY 2015-16

(Rs. Crore)					
Sr. No.	Power Station	Tax (Approved)	Tax (Actual)	Gain / (Loss) due to controllable factor	Gain / (Loss) due to uncontrollable factor
1	Ukai (1-5)	1.00	5.48		(4.48)
2	Gandhinagar (1-4)	2.00	4.25		(2.25)
3	Wanakbori 1-6 TPS	4.00	8.12		(4.12)
4	Sikka TPS	2.00	1.55		0.45
5	KLTPS 1-3	3.00	1.39		1.61
6	KLTPS 4	1.00	0.48		0.52
7	Dhuvaran CCPP 2	1.00	0.72		0.28
8	Ukai Hydro	1.00	1.97		(0.97)
9	Kadana Hydro	2.00	1.56		0.44
10	Ukai Extn. 6*	24.37	3.22		
11	Gandhinagar 5*	2.00	1.35		
12	Wanakbori 7 TPS*	2.00	1.35		
13	Sikka Extn. (3-4)*		3.22		
14	Dhuvaran CCPP 1*	1.00	0.69		
15	Dhuvaran CCPP 3*		2.42		



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Sr. No.	Power Station	Tax (Approved)	Tax (Actual)	Gain / (Loss) due to controllable factor	Gain / (Loss) due to uncontrollable factor
16	Utran (Gas)*	1.00	0.87		
17	Utran Extension*	2.00	2.41		
	Total	49.37	41.08		(8.52)

* PPA based stations

Commission's Analysis

The Commission has observed that the actual income tax as verified from the annual accounts for FY 2015-16 is Rs. 36.24 Crore. GSECL has submitted that in addition to tax for FY 2015-16. Rs. 4.83 Crore has also been claimed as prior period income tax paid in FY 2015-16. As per the additional queries raised by Commission, GSECL submitted copies of challans and year wise break up of Rs. 4.83 Crore tax paid in FY 2015-16. The details have been verified.

Income tax for Sikka 3 & 4 and Dhuvaran CCPP 3 is not computed by the Commission in the truing up of FY 2015-16 since the capital costs of these two stations are yet to be approved by the Commission.

Hence, Commission accordingly approves income tax for FY 2015-16.

The station-wise approved income tax and gains / (losses) are given in the table below:

Table 4.46: Approved Income tax and gains / (losses) for FY 2015-16

(Rs. Crore)

Sr. No.	Power Station	Approved for 2015-16	Claimed in truing up of 2015-16	Approved in truing up of 2015-16	Deviation +/-	Gain / (Loss) due to controllable factor	Gain / (Loss) due to uncontrollable factor
1	Ukai (1-5)	1.00	5.48	5.48	(4.48)		(4.48)
2	Gandhinagar (1-4)	2.00	4.25	4.25	(2.25)		(2.25)
3	Wanakbori 1-6 TPS	4.00	8.12	8.12	(4.12)		(4.12)
4	Sikka TPS	2.00	1.55	1.55	0.45		0.45
5	KLTPS 1-3	3.00	1.39	1.39	1.61		1.61
6	KLTPS 4	1.00	0.48	0.48	0.52		0.52
7	Dhuvaran CCPP 2	1.00	0.72	0.72	0.28		0.28
8	Ukai Hydro	1.00	1.97	1.97	(0.97)		(0.97)
9	Kadana Hydro	2.00	1.56	1.56	0.44		0.44
	Sub Total A	17.00	25.52	25.52			(8.52)



Sr. No.	Power Station	Approved for 2015-16	Claimed in truing up of 2015-16	Approved in truing up of 2015-16	Deviation +/-	Gain / (Loss) due to controllable factor	Gain / (Loss) due to uncontrollable factor
10	Ukai Extn. 6*	24.37	3.22	3.22			
11	Gandhinagar 5*	2.00	1.35	1.35			
12	Wanakbori 7 TPS*	2.00	1.35	1.35			
13	Sikka Extn. (3-4)*	-	-	-			
14	Dhuvaran CCPP 1*	1.00	0.69	0.69			
15	Dhuvaran CCPP 3*	-	-	-			
16	Utran (Gas)*	1.00	0.87	0.87			
17	Utran Extension*	2.00	2.41	2.41			
	Sub Total B	32.37	9.90	9.90			
	Total (A+B)	49.37	35.43	35.43	(8.52)		(8.52)

* PPA based stations

4.6.11 Non-Tariff Income for FY 2015-16

GSECL has claimed Rs. 105.55 Crore towards non-tariff income in the Truing up FY 2015-16 as against Rs. 155.83 Crore approved for the year in the respective Order. The non-tariff income approved for FY 2015-16 in the respective Order and as claimed by GSECL are given in the Table below:

Table 4.47: Non-Tariff Income claimed for FY 2015-16

(Rs. Crore)		
Particulars	Approved for 2015-16	Claimed in Truing up for 2015-16
Non-Tariff Income	155.83	105.55

Petitioner's Submission

The petitioner has submitted that the station wise non-tariff income claimed by GSECL in the Truing up for FY 2015-16 and the Gains/ (Losses) are given in the Table below:



Table 4.48: Gain / (loss) for Non-Tariff Income claimed for FY 2015-16

(Rs. Crore)

Sr. No.	Power Station	Non-Tariff Income (Approved)	Non-Tariff Income (Actual)	Gain / (Loss) due to controllable factor	Gain / (Loss) due to uncontrollable factor
1	Ukai (1-5)	25.27	13.45		(11.82)
2	Gandhinagar (1-4)	19.62	11.62		(8.00)
3	Wanakbori 1-6 TPS	37.45	26.31		(11.14)
4	Sikka TPS	7.13	5.20		(1.93)
5	KLTPS 1-3	6.39	4.83		(1.56)
6	KLTPS 4	2.23	1.65		(0.58)
7	Dhuvaran CCPP 2	3.33	1.81		(1.52)
8	Ukai Hydro	9.07	3.51		(5.56)
9	Kadana Hydro	7.19	3.06		(4.13)
10	Ukai Extn. 6*	7.33	6.48		
11	Gandhinagar 5*	6.24	3.42		
12	Wanakbori 7 TPS*	6.24	2.42		
13	Sikka Extn. (3-4)*	-	8.19		
14	Dhuvaran CCPP 1*	3.18	1.74		
15	Dhuvaran CCPP 3*	-	4.32		
16	Utran (Gas)*	4.01	1.85		
17	Utran Extension*	11.15	5.69		
	Total	155.83	105.55		(46.24)

* PPA based stations

Commission's Analysis

Commission observed that GSECL has not considered the fly-ash income as Non-Tariff income. As indicated in the public hearing, GSECL has been asked to maintain separate account for income generated from fly-ash. However, for regulatory purpose the Commission decides to consider fly-ash income as non-tariff income. Any expenditure in future that shall be incurred by GSECL for disposal of fly-ash and related activities, shall be allowed by the Commission as per the provisions of GERC (MYT) Regulations, 2016 after prudence check.

Non-Tariff income for Sikka 3 & 4 and Dhuvaran CCPP 3 is not computed by the Commission in the truing up of FY 2015-16 since the capital costs of these two stations are yet to be approved by the Commission.



Gains / (Losses):

The parameters, which impact non-tariff income, are considered uncontrollable. The Commission accordingly approves the Gains/(Losses) on account of non-tariff income in the Truing up as detailed in the Table below:

Table 4.49: Approved Non-Tariff Income and gain / (loss) for FY 2015-16

(Rs. Crore)

Sr. No.	Power Station	Approved for 2015-16	Claimed in truing up of 2015-16	Approved in truing up of 2015-16	Deviation +/-	Gain / (Loss) due to controllable factor	Gain / (Loss) due to uncontrollable factor
1	Ukai (1-5)	25.27	13.45	22.11	(3.16)		(3.16)
2	Gandhinagar (1-4)	19.62	11.62	19.64	0.02		0.02
3	Wanakbori 1-6 TPS	37.45	26.31	46.29	8.84		8.84
4	Sikka TPS	7.13	5.20	6.20	(0.93)		(0.93)
5	KLTPS 1-3	6.39	4.83	4.84	(1.55)		(1.55)
6	KLTPS 4	2.23	1.65	1.65	(0.58)		(0.58)
7	Dhuvaran CCPP 2	3.33	1.81	1.81	(1.52)		(1.52)
8	Ukai Hydro	9.07	3.51	3.51	(5.56)		(5.56)
9	Kadana Hydro	7.19	3.06	3.06	(4.13)		(4.13)
	Sub Total A	117.68	71.44	109.11	(8.57)		(8.57)
10	Ukai Extn. 6*	7.33	6.48	12.71			
11	Gandhinagar 5*	6.24	3.42	11.93			
12	Wanakbori 7 TPS*	6.24	2.42	6.75			
13	Sikka Extn. (3-4)*	-	-	-			
14	Dhuvaran CCPP 1*	3.18	1.74	1.74			
15	Dhuvaran CCPP 3*	-	-	-			
16	Utran (Gas)*	4.01	1.85	1.85			
17	Utran Extension*	11.15	5.69	5.69			
	Sub Total B	38.15	21.60	40.67			
	Total (A+B)	155.83	93.04	149.77	(8.57)		(8.57)

* PPA based stations

4.7 Approved Fixed Charges

The Commission has reviewed the performance of GSECL under Regulation 22 of GERC (MYT) Regulations, 2011 with reference to audited annual accounts for FY 2015-16.



The Commission has discussed and approved various components of fixed charges for approval of trued up ARR in above paragraphs.

The fixed charges approved for FY 2015-16 in the respective Order for FY 2011-16, charges now approved by the Commission, and deviation (gain / (loss)) with reference to approved values are given in the Table below:

Table 4.50: Fixed Charges Approved in the Truing up for FY 2015-16

(Rs. Crore)

Sr. No.	Fixed Charges	Approved for 2015-16	Claimed in truing up of 2015-16	Approved in truing up of 2015-16	Deviation +/-
1	2	3	4	5	6=3-5
Non-PPA based Stations (A)					
1	Depreciation	418.21	497.22	422.24	(4.03)
2	Interest & Finance charges	197.10	48.00	127.99	69.11
3	Return on equity	277.20	286.07	273.22	3.98
4	Interest on working capital	143.54	271.99	204.48	(60.94)
5	O&M expenses	661.42	672.56	646.70	14.72
6	Water charges	75.53	50.51	50.51	25.02
7	SLDC Charges	2.14	0.99	0.99	1.15
8	Income Tax	17.00	25.52	25.52	(8.52)
9	Total Fixed Charges	1792.15	1852.87	1751.64	40.49
10	Less: Non-Tariff Income	117.68	71.44	109.11	(8.57)
11	Net Fixed Charges	1674.47	1781.43	1642.53	31.92
PPA Based Stations (B)					
1	Depreciation	304.21	259.72	255.88	
2	Interest & Finance charges	261.49	239.03	300.03	
3	Return on equity	254.59	259.91	208.03	
4	Interest on working capital	63.02	122.16	95.90	
5	O&M expenses	219.14	149.71	144.67	
6	Water charges	19.03	23.86	23.86	
7	SLDC Charges	0.71	0.28	0.28	
8	Income Tax	32.37	9.90	9.90	
9	Total Fixed Charges	1154.56	1064.57	1038.56	
10	Less: Non-Tariff Income	38.15	21.61	40.67	
11	Net Fixed Charges	1116.41	1042.97	997.89	
	TOTAL Net Fixed Charges (A+B)	2790.87	2824.40	2640.42	



The station wise approved fixed charges are given in the Table below:

Table 4.51: Approved Station-wise Fixed Charges for FY 2015-16

(Rs. Crore)												
Sr. No.	Power Station	Depreciation	Interest & Finance Charges	Return on Equity	Interest on Working Capital	O&M Expenses	Water Charges	SLDC Charges	Income Tax	Total Fixed Cost	Less Non-Tariff Income	Net Fixed Charges
A	Non-PPA based Stations											
1	Ukai (1-5)	74.08	22.04	27.35	45.68	154.06	0.13	0.19	5.48	329.01	22.11	306.90
2	Gandhinagar (1-4)	81.81	25.99	38.50	39.61	94.32	11.01	0.20	4.25	295.70	19.64	276.06
3	Wanakbori 1-6 TPS	89.19	20.94	63.85	80.07	172.98	35.76	0.31	8.12	471.23	46.29	424.94
4	Sikka TPS	33.03	3.98	22.89	15.09	56.16	2.28	0.06	1.55	135.04	6.20	128.84
5	KLTPS 1-3	64.61	11.11	47.47	10.34	95.69	0.43	0.06	1.39	231.10	4.84	226.25
6	KLTPS 4	35.71	27.62	28.76	3.98	15.71	0.13	0.01	0.48	112.40	1.65	110.74
7	Dhuvaran (CCPP 2)	20.12	12.28	6.24	7.44	26.33	0.76	0.03	0.72	73.92	1.81	72.11
8	Ukai Hydro	8.29	3.03	9.77	0.80	13.69	-	0.07	1.97	37.62	3.51	34.12
9	Kadana Hydro	15.40	1.00	28.40	1.46	17.75	-	0.06	1.56	65.62	3.06	62.56
	Sub Total (A)	422.24	127.99	273.22	204.48	646.70	50.51	0.99	25.52	1751.64	109.11	1642.53
B	PPA based Stations											
1	Ukai Extn 6*	144.72	182.04	122.05	34.40	31.03	0.10	0.12	3.22	517.68	12.71	504.97
2	Gandhinagar 5*	1.79	0.00	28.67	15.21	24.21	11.87	0.00	1.35	83.12	11.93	71.19
3	Wanakbori 7*	1.59	0.00	26.02	13.70	14.78	8.18	0.03	1.35	65.66	6.75	58.91
4	Sikka Extn. 3 & 4 *	-	-	-	-	-	-	-	-	-	-	-
5	Dhuvaran(CCPP 1)*	18.76	0.00	10.25	5.46	24.96	-	0.02	0.69	60.14	1.74	58.40
6	Dhuvaran(CCPP 3)*	-	-	-	-	-	-	-	-	-	-	-
7	Utran Gas*	23.49	0.00	10.94	1.23	8.73	0.06	0.05	0.87	45.36	1.85	43.51
8	Utran Extension*	65.55	117.99	10.08	25.91	40.96	3.64	0.07	2.41	266.61	5.69	260.92
	Sub Total (B)	255.88	300.03	208.03	95.90	144.67	23.86	0.28	9.90	1038.56	40.67	997.89
	Total (A+B)	678.12	428.03	481.24	300.38	791.36	74.37	1.27	35.43	2790.20	149.77	2640.42

* PPA based stations



Sharing of Gains or Losses for FY 2015-16

The Commission has analyzed the gains / losses on account of controllable and uncontrollable factors.

The relevant Regulations of GERC (MYT) Regulations, 2011 are extracted below

Regulation 24. Mechanism for pass through of gains or losses on account of uncontrollable factors

24.1 The approved aggregate gain or loss to the Generating Company or Transmission Licensee or Distribution Licensee on account of uncontrollable factors shall be passed through as an adjustment in the Tariff of the Generating Company or Transmission Licensee or Distribution Licensee over such period as may be specified in the Order of the Commission passed under these Regulations.

24.2 The Generating Company or Transmission Licensee or Distribution Licensee shall submit such details of the variation between expenses incurred and revenue earned and figures approved by the Commission, in the prescribed format to the Commission, along with detailed computations and supporting documents as may be required for verification by the Commission.

24.3 Nothing contained in this Regulation 24 shall apply in respect of any gain or loss arising out of variations in the price of fuel and power purchase which shall be dealt with as specified by the Commission from time to time.

Regulation 25. Mechanism for sharing of gains or losses on account of controllable factors

25.1 The approved aggregate gain to the Generating Company or Transmission Licensee or Distribution Licensee on account of controllable factors shall be dealt with in the following manner:

- (a) One-third of the amount of such gain shall be passed on as a rebate in Tariffs over such period as may be specified in the Order of the Commission under Regulation 22.6;*
- (b) The balance amount, which will amount to two-thirds of such gain, may be utilized at the discretion of the Generating Company or Transmission Licensee or Distribution Licensee.*



25.2 The approved aggregate loss to the Generating Company or Transmission Licensee or Distribution Licensee on account of controllable factors shall be dealt with in the following manner:

- (a) *One-third of the amount of such loss may be passed on as an additional charge in Tariffs over such period as may be specified in the Order of the Commission under Regulation 22.6; and*
- (b) *The balance amount, which will amount to two-thirds of such loss, shall be absorbed by the Generating Company or Transmission Licensee or Distribution Licensee.”*

The Gains / (Losses) due to controllable factors in respect of O&M charges and fuel charges approved to be passed through to their beneficiaries are given in the Table below:

Table 4.52: Approved Gains/ (losses) due to controllable factors for FY 2015-16
(Rs. Crore)

Sr. No.	Power Station	Approved for 2015-16			Gains / (Losses) to be passed through 1/3
		O&M Charges	Fuel Charges	Total	
A	Non-PPA based Stations				
1	Ukai (1-5)	6.93	5.52	12.45	4.15
2	Gandhinagar (1-4)	19.70	27.96	47.66	15.89
3	Wanakbori 1-6 TPS	(8.24)	(30.96)	(39.2)	(13.07)
4	Sikka TPS	1.59	2.22	3.81	1.27
5	KLTPS 1-3	(5.16)	4.56	(0.6)	(0.20)
6	KLTPS 4	4.56	(2.12)	2.44	0.81
7	Dhuvaran (CCPP 2)	(4.04)	(2.95)	(6.99)	(2.33)
8	Ukai Hydro	0.65	-	0.65	0.22
9	Kadana Hydro	(1.26)	-	(1.26)	(0.42)
	Sub Total (A)	14.72	4.23	18.95	6.32
B	PPA based Stations				
1	Ukai Extn 6				
2	Gandhinagar 5				
3	Wanakbori 7				
4	Sikka Extn. 3 & 4				
5	Dhuvaran (CCPP 1)				
6	Dhuvaran (CCPP 3)				



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Sr. No.	Power Station	Approved for 2015-16			Gains / (Losses) to be passed through 1/3
		O&M Charges	Fuel Charges	Total	
7	Utran Gas				
8	Utran Extension				
	Sub Total (B)				
	Total (A+B)	14.72	4.23	18.95	6.32

The Gains / (Losses) due to uncontrollable factors in respect of depreciation, interest & finance charges, return on equity, interest on working capital, SLDC, water charges, income tax and non-tariff income approved to be passed through to the beneficiaries are given in the Table below:



Table 4.53: Approved Gains / (Losses) due to Uncontrollable Factors for FY 2015-16

Sr. No.	Power Station	Approved for 2015-16								Total Gains / (Losses) to be passed through
		Depreciation	Interest & Finance	Return on Equity	Interest on Working Capital	SLDC	Water Charges	Income Tax	Non - Tariff Income	
A	Non-PPA based Stations									
1	Ukai (1-5)	0.80	39.52	6.32	(18.28)	0.27	(0.13)	(4.48)	(3.16)	20.86
2	Gandhinagar (1-4)	(15.43)	(13.60)	(7.84)	(10.96)	0.16	19.46	(2.25)	0.02	(30.45)
3	Wanakbori 1-6 TPS	17.86	48.00	4.96	(27.83)	0.37	4.81	(4.12)	8.84	52.88
4	Sikka TPS	(2.53)	(0.07)	(2.45)	(5.78)	0.07	1.61	0.45	(0.93)	(9.63)
5	KLTPS 1-3	(4.51)	3.94	(3.79)	1.74	0.06	0.17	1.61	(1.55)	(2.32)
6	KLTPS 4	(0.54)	(0.43)	(0.34)	5.10	0.03	(0.13)	0.52	(0.58)	3.63
7	Dhuvaran (CCPP 2)	1.52	(8.74)	9.16	(4.31)	0.03	(0.76)	0.28	(1.52)	(4.35)
8	Ukai Hydro	(0.87)	(0.63)	(1.65)	(0.25)	0.09	-	(0.97)	(5.56)	(9.84)
9	Kadana Hydro	(0.33)	1.12	(0.40)	(0.36)	0.07	-	0.44	(4.13)	(3.58)
	Sub Total (A)	(4.03)	69.11	3.98	(60.94)	1.15	25.02	(8.52)	(8.57)	17.20
B	PPA based Stations									
1	Ukai Extn 6									
2	Gandhinagar 5									
3	Wanakbori 7									
4	Sikka Extn. 3 & 4									
5	Dhuvaran (CCPP 1)									
6	Dhuvaran (CCPP 3)									
7	Utran Gas									
8	Utran Extension									
	Sub Total (B)									
	Total (A+B)	(4.03)	69.11	3.98	(60.94)	1.15	25.02	(8.52)	(8.57)	17.20



The consolidated Gains / (Losses) approved in the Truing up for FY 2015-16 are given in the Table below:

Table 4.54: Total Consolidated Gains / (Losses) Approved for FY 2015-16

(Rs. Crore)				
Sr. No.	Power Station	Gains / (Losses) of controllable factors (a)	Gains / (Losses) of Uncontrollable factors to be passed through (b)	Total Gains / (Losses) c = a/3+b
A	Non-PPA based Stations			
1	Ukai (1-5)	12.45	20.86	25.01
2	Gandhinagar (1-4)	47.66	(30.45)	(14.57)
3	Wanakbori 1-6 TPS	(39.20)	52.88	39.82
4	Sikka TPS	3.81	(9.63)	(8.36)
5	KLTPS 1-3	(0.60)	(2.32)	(2.52)
6	KLTPS 4	2.44	3.63	4.45
7	Dhuvaran (CCPP 2)	(6.99)	(4.35)	(6.67)
8	Ukai Hydro	0.65	(9.84)	(9.63)
9	Kadana Hydro	(1.26)	(3.58)	(4.00)
	Sub Total (A)	18.95	17.20	23.52
B	PPA based Stations			
1	Ukai Extn 6			
2	Gandhinagar 5			
3	Wanakbori 7			
4	Sikka Extn. 3 & 4			
5	Dhuvaran (CCPP 1)			
6	Dhuvaran (CCPP 3)			
7	Utran Gas			
8	Utran Extension			
	Sub Total (B)			
	Total (A+B)	18.95	17.20	23.52

The Commission thus approves the net gain of Rs. 23.52 Crore in the Truing up for FY 2015-16. The net gain of Rs. 23.52 Crore approved in the truing up for FY 2015-16 is to be passed on to the DISCOMs in 12 equal monthly installments through GUVNL.



Approved fuel costs for 2015-16 for true-up
Fuel costs(Coal, Lignite &Secondary oil) - Ukai TPS 1 to 5

Sr. No.	Item	Derivation	Unit	2015-16
1	Gross Generation	A	MUs	3102.74
2	Auxiliary Consumption	C	%	9.00%
3	Auxiliary Consumption	B	MUs	279.25
4	Net Generation	$Y=A-B$	MUs	2823.49
5	Station Heat Rate	D	Kcal/kWh	2750
6	Sp. Oil Consumption	E	ml/kWh	2.00
7	Gross calorific value of coal	F	Kcal/Kg	3902
8	Calorific value of oil	G	Kcal/l	10426.46
9	Overall Heat	$H= A \times D$	Gcal	8532535.00
10	Heat from Oil	$I= (A \times E \times G)/1000$	Gcal	64701.17
11	Heat from Coal	$J = H-I$	Gcal	8467833.83
12	Transit losses	K	%	0.80%
13	Coal Blend			
14	(A) Indigenous coal	X1	%	25%
15	(B) Washed Coal	X2	%	70%
16	(c) Imported Coal	X3	%	5%
17	Actual oil consumption	$L= A \times E$	Kl	6205.48
18	Actual Coal consumption	$M= (J \times 1000)/F$	MT	2170126.56
19	(A) Indigenous coal	$Q1=M^* \times X1/(1-K)$	MT	549632.81
20	(B) Washed Coal	$Q2=M^* \times X2 / (1-K)$	MT	1539171.41
21	(c) Imported Coal	$Q3=M^* \times X3$	MT	98032.77
22	Price of coal			
23	(A) Indigenous coal	P1	Rs./MT	3407.44
24	(B) Washed Coal	P2	Rs./MT	3701.11
25	(c) Imported Coal	P3	Rs./MT	6227.10
26	Price of oil	P4	Rs./Kl	33170.19
27	Coal Cost			
28	(A) Indigenous coal	$N1=Q1 \times P1/10^5$	Rs.Lakh	18728.42
29	(B) Washed Coal	$N2=Q2 \times P2/10^5$	Rs.Lakh	56966.48
30	(c) Imported Coal	$N3=Q3 \times P3/10^5$	Rs.Lakh	6104.59
31	Total coal cost	$N4= N1+N2+N3$	Rs.Lakh	81799.49
32	Oil Cost	$N5=P4 \times L/10^5$	Rs.Lakh	2058.37
33	Total fuel cost	$O= N4+N5$	Rs.Lakh	83857.86
34	Fuel cost/Unit (Gross)	$P= O/(A^*10)$	Rs/kWh	2.70
35	Fuel cost/Unit (Net)	$Q=O/(Y^*10)$	Rs/kWh	2.97
36	Cost of fuel/G.Cal	$R=(O/H)^*10^5$	Rs./Gcal	982.80
37	Actual Auxiliary Consumption	C1	%	9.48%
38	Actual Auxiliary Consumption	$B1=A^*C1$	MUs	294.23
39	Actual net generation	$S= A - B1$	MUs	2808.51
40	Normative Fuel Cost for actual Net Generation	$T=S^*Q/10$	Rs. Crore	834.13



Approved fuel costs for 2015-16 for true-up
Fuel costs(Coal, Lignite &Secondary oil) - Ukai 6

Sr. No.	Item	Derivation	Unit	2015-16
1	Gross Generation	A	MUs	2452.27
2	Auxiliary Consumption	C	%	6.00%
3	Auxiliary Consumption	B	MUs	147.14
4	Net Generation	$Y=A-B$	MUs	2305.13
5	Station Heat Rate	D	Kcal/kWh	2385
6	Sp. Oil Consumption	E	ml/kWh	1.00
7	Gross calorific value of coal	F	Kcal/Kg	3925
8	Calorific value of oil	G	Kcal/l	10423.13
9	Overall Heat	$H= A \times D$	Gcal	5848663.95
10	Heat from Oil	$I= (A \times E \times G)/1000$	Gcal	25560.33
11	Heat from Coal	$J = H-I$	Gcal	5823103.62
12	Transit losses	K	%	0.80%
13	Coal Blend			
14	(A) Indigenous coal	X1	%	8%
15	(B) Washed Coal	X2	%	89%
16	(c) Imported Coal	X3	%	4%
17	Actual oil consumption	$L= A \times E$	Kl	2452.27
18	Actual Coal consumption	$M= (J \times 1000)/F$	MT	1483593.28
19	(A) Indigenous coal	$Q1=M* \times X1/(1-K)$	MT	113664.78
20	(B) Washed Coal	$Q2=M* \times X2 / (1-K)$	MT	1326259.31
21	(c) Imported Coal	$Q3=M* \times X3$	MT	55188.58
22	Price of coal			
23	(A) Indigenous coal	P1	Rs./MT	3527.49
24	(B) Washed Coal	P2	Rs./MT	3820.26
25	(c) Imported Coal	P3	Rs./MT	6221.72
26	Price of oil	P4	Rs./Kl	32949.92
27	Coal Cost			
28	(A) Indigenous coal	$N1=Q1 \times P1/10^5$	Rs.Lakh	4009.52
29	(B) Washed Coal	$N2=Q2 \times P2/10^5$	Rs.Lakh	50666.57
30	(c) Imported Coal	$N3=Q3 \times P3/10^5$	Rs.Lakh	3433.68
31	Total coal cost	$N4= N1+N2+N3$	Rs.Lakh	58109.76
32	Oil Cost	$N5=P4 \times L/10^5$	Rs.Lakh	808.02
33	Total fuel cost	$O= N4+N5$	Rs.Lakh	58917.79
34	Fuel cost/Unit (Gross)	$P= O/(A*10)$	Rs/kWh	2.40
35	Fuel cost/Unit (Net)	$Q=O/(Y*10)$	Rs/kWh	2.56
36	Cost of fuel/G.Cal	$R=(O/H)*10^5$	Rs./Gcal	1007.37
37	Actual Auxiliary Consumption	C1	%	6.61%
38	Actual Auxiliary Consumption	$B1=A*C1$	MUs	162.13
39	Actual net generation	$S= A - B1$	MUs	2290.14
40	Normative Fuel Cost for actual Net Generation	$T=S*Q/10$	Rs. Crore	585.35



Approved fuel costs for 2015-16 for true-up
Fuel costs(Coal, Lignite &Secondary oil) - Gandhinagar 1-4

Sr. No.	Item	Derivation	Unit	2015-16
1	Gross Generation	A	MUs	1314.42
2	Auxiliary Consumption	C	%	10.00%
3	Auxiliary Consumption	B	MUs	131.44
4	Net Generation	$Y=A-B$	MUs	1182.98
5	Station Heat Rate	D	Kcal/kWh	2782
6	Sp. Oil Consumption	E	ml/kWh	1.50
7	Gross calorific value of coal	F	Kcal/Kg	3970.00
8	Calorific value of oil	G	Kcal/l	10427.44
9	Overall Heat	$H= A \times D$	Gcal	3656716.44
10	Heat from Oil	$I= (A \times E \times G)/1000$	Gcal	20559.04
11	Heat from Coal	$J = H-I$	Gcal	3636157.40
12	Transit losses	K	%	0.80%
13	Coal Blend			
14	(A) Indigenous coal	X1	%	5%
15	(B) Washed Coal	X2	%	90%
16	(c) Imported Coal	X3	%	5%
17	Actual oil consumption	$L= A \times E$	Kl	1971.63
18	Actual Coal consumption	$M= (J \times 1000)/F$	MT	915908.66
19	(A) Indigenous coal	$Q1=M^* \times X1/(1-K)$	MT	46263.60
20	(B) Washed Coal	$Q2=M^* \times X2 / (1-K)$	MT	829878.41
21	(c) Imported Coal	$Q3=M^* \times X3$	MT	46775.79
22	Price of coal			
23	(A) Indigenous coal	P1	Rs./MT	5074.84
24	(B) Washed Coal	P2	Rs./MT	4575.06
25	(c) Imported Coal	P3	Rs./MT	6817.29
26	Price of oil	P4	Rs./Kl	31792.72
27	Coal Cost			
28	(A) Indigenous coal	$N1=Q1 \times P1$	Rs.Lakh	2347.80
29	(B) Washed Coal	$N2=Q2 \times P2$	Rs.Lakh	37967.43
30	(c) Imported Coal	$N3=Q3 \times P3$	Rs.Lakh	3188.84
31	Total coal cost	$N4= N1+N2+N3$	Rs.Lakh	43504.07
32	Oil Cost	$N5=P4 \times L/10^5$	Rs.Lakh	626.83
33	Total fuel cost	$O= N4+N5$	Rs.Lakh	44130.91
34	Fuel cost/Unit (Gross)	$P= O/(A*10)$	Rs/kWh	3.36
35	Fuel cost/Unit (Net)	$Q=O/(Y*10)$	Rs/kWh	3.73
36	Cost of fuel/G.Cal	$R=(O/H)*10^5$	Rs./Gcal	1206.85
37	Actual Auxiliary Consumption	C1	%	11.43%
38	Actual Auxiliary Consumption	$B1=A*C1$	MUs	150.20
39	Actual net generation	$S= A - B1$	MUs	1164.22
40	Normative Fuel Cost for actual Net Generation	$T=S*Q/10$	Rs. Crore	434.31



Approved fuel costs for 2015-16 for true-up
Fuel costs(Coal, Lignite &Secondary oil) - Gandhinagar 5

Sr. No.	Item	Derivation	Unit	2015-16
1	Gross Generation	A	MUs	1417.49
2	Auxiliary Consumption	C	%	9.00%
3	Auxiliary Consumption	B	MUs	127.57
4	Net Generation	$Y=A-B$	MUs	1289.92
5	Station Heat Rate	D	Kcal/kWh	2460
6	Sp. Oil Consumption	E	ml/kWh	3.50
7	Gross calorific value of coal	F	Kcal/Kg	3968.00
8	Calorific value of oil	G	Kcal/l	10355.08
9	Overall Heat	$H= A \times D$	Gcal	3487025.40
10	Heat from Oil	$I= (A \times E \times G)/1000$	Gcal	51373.79
11	Heat from Coal	$J = H-I$	Gcal	3435651.61
12	Transit losses	K	%	0.80%
13	Coal Blend			
14	(A) Indigenous coal	X1	%	6%
15	(B) Washed Coal	X2	%	89%
16	(c) Imported Coal	X3	%	5%
17	Actual oil consumption	$L= A \times E$	Kl	4961.22
18	Actual Coal consumption	$M= (J \times 1000)/F$	MT	865839.62
19	(A) Indigenous coal	$Q1=M* X X1/(1-K)$	MT	49495.14
20	(B) Washed Coal	$Q2=M* X X2 / (1-K)$	MT	779842.44
21	(c) Imported Coal	$Q3=M* X X3$	MT	43136.74
22	Price of coal			
23	(A) Indigenous coal	P1	Rs./MT	5110.00
24	(B) Washed Coal	P2	Rs./MT	4507.13
25	(c) Imported Coal	P3	Rs./MT	7186.85
26	Price of oil	P4	Rs./Kl	32220.88
27	Coal Cost			
28	(A) Indigenous coal	$N1=Q1 \times P1$	Rs.Lakh	2529.20
29	(B) Washed Coal	$N2=Q2 \times P2$	Rs.Lakh	35148.48
30	(c) Imported Coal	$N3=Q3 \times P3$	Rs.Lakh	3100.17
31	Total coal cost	$N4= N1+N2+N3$	Rs.Lakh	40777.86
32	Oil Cost	$N5=P4 \times L/10^5$	Rs.Lakh	1598.55
33	Total fuel cost	$O= N4+N5$	Rs.Lakh	42376.40
34	Fuel cost/Unit (Gross)	$P= O/(A*10)$	Rs/kWh	2.99
35	Fuel cost/Unit (Net)	$Q=O/(Y*10)$	Rs/kWh	3.29
36	Cost of fuel/G.Cal	$R=(O/H)*10^5$	Rs./Gcal	1215.26
37	Actual Auxiliary Consumption	C1	%	9.91%
38	Actual Auxiliary Consumption	$B1=A*C1$	MUs	140.50
39	Actual net generation	$S= A - B1$	MUs	1276.99
40	Normative Fuel Cost for actual Net Generation	$T=S*Q/10$	Rs. Crore	419.52



Approved fuel costs for 2015-16 for true-up
Fuel costs(Coal, Lignite &Secondary oil) - Wanakbori 1-6

Sr. No.	Item	Derivation	Unit	2015-16
1	Gross Generation	A	MUs	4602.47
2	Auxiliary Consumption	C	%	9.00%
3	Auxiliary Consumption	B	MUs	414.22
4	Net Generation	$Y=A-B$	MUs	4188.25
5	Station Heat Rate	D	Kcal/kWh	2625
6	Sp. Oil Consumption	E	ml/kWh	1.00
7	Gross calorific value of coal	F	Kcal/Kg	3851.00
8	Calorific value of oil	G	Kcal/l	10403.25
9	Overall Heat	$H= A \times D$	Gcal	12081483.75
10	Heat from Oil	$I= (A \times E \times G)/1000$	Gcal	47880.65
11	Heat from Coal	$J = H-I$	Gcal	12033603.10
12	Transit losses	K	%	0.80%
13	Coal Blend			
14	(A) Indigenous coal	X1	%	1%
15	(B) Washed Coal	X2	%	97%
16	(c) Imported Coal	X3	%	2%
17	Actual oil consumption	$L= A \times E$	Kl	4602.47
18	Actual Coal consumption	$M= (J \times 1000)/F$	MT	3124799.56
19	(A) Indigenous coal	$Q1=M^* \times X1/(1-K)$	MT	38007.23
20	(B) Washed Coal	$Q2=M^* \times X2 / (1-K)$	MT	3052764.97
21	(c) Imported Coal	$Q3=M^* \times X3$	MT	58753.54
22	Price of coal			
23	(A) Indigenous coal	P1	Rs./MT	5649.74
24	(B) Washed Coal	P2	Rs./MT	4615.21
25	(c) Imported Coal	P3	Rs./MT	6750.21
26	Price of oil	P4	Rs./Kl	31021.56
27	Coal Cost			
28	(A) Indigenous coal	$N1=Q1 \times P1$	Rs.Lakh	2147.31
29	(B) Washed Coal	$N2=Q2 \times P2$	Rs.Lakh	140891.38
30	(c) Imported Coal	$N3=Q3 \times P3$	Rs.Lakh	3965.99
31	Total coal cost	$N4= N1+N2+N3$	Rs.Lakh	147004.67
32	Oil Cost	$N5=P4 \times L/10^5$	Rs.Lakh	1427.76
33	Total fuel cost	$O= N4+N5$	Rs.Lakh	148432.43
34	Fuel cost/Unit (Gross)	$P= O/(A^*10)$	Rs/kWh	3.23
35	Fuel cost/Unit (Net)	$Q=O/(Y^*10)$	Rs/kWh	3.54
36	Cost of fuel/G.Cal	$R=(O/H)^*10^5$	Rs./Gcal	1228.59
37	Actual Auxiliary Consumption	C1	%	9.14%
38	Actual Auxiliary Consumption	$B1=A^*C1$	MUs	420.85
39	Actual net generation	$S= A - B1$	MUs	4181.62
40	Normative Fuel Cost for actual Net Generation	$T=S^*Q/10$	Rs. Crore	1481.98



Approved fuel costs for 2015-16 for true-up
Fuel costs(Coal, Lignite &Secondary oil) - Wanakbori 7

Sr. No.	Item	Derivation	Unit	2015-16
1	Gross Generation	A	MUs	1080.47
2	Auxiliary Consumption	C	%	9.00%
3	Auxiliary Consumption	B	MUs	97.24
4	Net Generation	$Y=A-B$	MUs	983.23
5	Station Heat Rate	D	Kcal/kWh	2460
6	Sp. Oil Consumption	E	ml/kWh	3.50
7	Gross calorific value of coal	F	Kcal/Kg	3909.00
8	Calorific value of oil	G	Kcal/l	10396.00
9	Overall Heat	$H= A \times D$	Gcal	2657956.20
10	Heat from Oil	$I= (A \times E \times G)/1000$	Gcal	39313.98
11	Heat from Coal	$J = H-I$	Gcal	2618642.22
12	Transit losses	K	%	0.80%
13	Coal Blend			
14	(A) Indigenous coal	X1	%	2%
15	(B) Washed Coal	X2	%	96%
16	(c) Imported Coal	X3	%	2%
17	Actual oil consumption	$L= A \times E$	Kl	3781.65
18	Actual Coal consumption	$M= (J \times 1000)/F$	MT	669900.80
19	(A) Indigenous coal	$Q1=M^* \times X1/(1-K)$	MT	11537.47
20	(B) Washed Coal	$Q2=M^* \times X2 / (1-K)$	MT	647320.05
21	(c) Imported Coal	$Q3=M^* \times X3$	MT	16314.14
22	Price of coal			
23	(A) Indigenous coal	P1	Rs./MT	5703.02
24	(B) Washed Coal	P2	Rs./MT	4636.35
25	(c) Imported Coal	P3	Rs./MT	6818.93
26	Price of oil	P4	Rs./Kl	31535.82
27	Coal Cost			
28	(A) Indigenous coal	$N1=Q1 \times P1$	Rs.Lakh	657.98
29	(B) Washed Coal	$N2=Q2 \times P2$	Rs.Lakh	30012.05
30	(c) Imported Coal	$N3=Q3 \times P3$	Rs.Lakh	1112.45
31	Total coal cost	$N4= N1+N2+N3$	Rs.Lakh	31782.49
32	Oil Cost	$N5=P4 \times L/10^5$	Rs.Lakh	1192.57
33	Total fuel cost	$O= N4+N5$	Rs.Lakh	32975.06
34	Fuel cost/Unit (Gross)	$P= O/(A*10)$	Rs/kWh	3.05
35	Fuel cost/Unit (Net)	$Q=O/(Y*10)$	Rs/kWh	3.35
36	Cost of fuel/G.Cal	$R=(O/H)*10^5$	Rs./Gcal	1240.62
37	Actual Auxiliary Consumption	C1	%	9.74%
38	Actual Auxiliary Consumption	$B1=A*C1$	MUs	105.26
39	Actual net generation	$S= A - B1$	MUs	975.21
40	Normative Fuel Cost for actual Net Generation	$T=S*Q/10$	Rs. Crore	327.06



Approved fuel costs for 2015-16 for true-up
Fuel costs(Coal, Lignite &Secondary oil) - Sikka TPS

Sr. No.	Item	Derivation	Unit	2015-16
1	Gross Generation	A	MUs	337.10
2	Auxiliary Consumption	C	%	11.00%
3	Auxiliary Consumption	B	MUs	37.08
4	Net Generation	$Y=A-B$	MUs	300.02
5	Station Heat Rate	D	Kcal/kWh	3020
6	Sp. Oil Consumption	E	ml/kWh	4.00
7	Gross calorific value of coal	F	Kcal/Kg	4137
8	Calorific value of oil	G	Kcal/l	10435.61
9	Overall Heat	$H= A \times D$	Gcal	1018042.00
10	Heat from Oil	$I= (A \times E \times G)/1000$	Gcal	14071.38
11	Heat from Coal	$J = H-I$	Gcal	1003970.62
12	Transit losses	K	%	0.80%
13	Coal Blend			
14	(A) Indigenous coal	X1	%	0%
15	(B) Washed Coal	X2	%	89%
16	(c) Imported Coal	X3	%	11%
17	Actual oil consumption	$L= A \times E$	Kl	1348.40
18	Actual Coal consumption	$M= (J \times 1000)/F$	MT	242680.84
19	(A) Indigenous coal	$Q1=M^* \times X1/(1-K)$	MT	0.00
20	(B) Washed Coal	$Q2=M^* \times X2 / (1-K)$	MT	218119.71
21	(c) Imported Coal	$Q3=M^* \times X3$	MT	26306.08
22	Price of coal			
23	(A) Indigenous coal	P1	Rs./MT	0.00
24	(B) Washed Coal	P2	Rs./MT	5603.10
25	(c) Imported Coal	P3	Rs./MT	3409.48
26	Price of oil	P4	Rs./Kl	34657.60
27	Coal Cost			
28	(A) Indigenous coal	$N1=Q1 \times P1$	Rs.Lakh	0.00
29	(B) Washed Coal	$N2=Q2 \times P2$	Rs.Lakh	12221.47
30	(c) Imported Coal	$N3=Q3 \times P3$	Rs.Lakh	896.90
31	Total coal cost	$N4= N1+N2+N3$	Rs.Lakh	13118.37
32	Oil Cost	$N5=P4 \times L/10^5$	Rs.Lakh	467.32
33	Total fuel cost	$O= N4+N5$	Rs.Lakh	13585.69
34	Fuel cost/Unit (Gross)	$P= O/(A*10)$	Rs/kWh	4.03
35	Fuel cost/Unit (Net)	$Q=O/(Y*10)$	Rs/kWh	4.53
36	Cost of fuel/G.Cal	$R=(O/H)*10^5$	Rs./Gcal	1334.49
37	Actual Auxiliary Consumption	C1	%	13.92%
38	Actual Auxiliary Consumption	$B1=A*C1$	MUs	46.92
39	Actual net generation	$S= A - B1$	MUs	290.18
40	Normative Fuel Cost for actual Net Generation	$T=S*Q/10$	Rs. Crore	131.40



Approved fuel costs for 2015-16 for true-up
Fuel costs(Coal, Lignite &Secondary oil) -KLTPS 1-3

Sr. No.	Item	Derivation	Unit	2015-16
1	Gross Generation	A	MUs	1284.18
2	Auxiliary Consumption	C	%	12.00%
3	Auxiliary Consumption	B	MUs	154.10
4	Net Generation	$Y=A-B$	MUs	1130.08
5	Station Heat Rate	D	Kcal/kWh	3300
6	Sp. Oil Consumption	E	ml/kWh	3.00
7	Gross calorific value of coal	F	Kcal/Kg	2837
8	Calorific value of oil	G	Kcal/l	10237.26
9	Overall Heat	$H= A \times D$	Gcal	4237794.00
10	Heat from Oil	$I= (A \times E \times G)/1000$	Gcal	39439.45
11	Heat from Coal	$J = H-I$	Gcal	4198354.55
12	Transit losses	K	%	0.20%
13	Actual oil consumption	$L= A \times E$	Kl	3852.54
14	Actual Coal consumption	$M= (J \times 1000)/F$	MT	1479857.09
15	Coal consumption incl. transit losses	$N=M/(1-K)$	MT	1482822.73
16	Price of lignite	P1	Rs./MT	1072.14
17	Price of oil	P2	Rs./Kl	28419.47
18	Cost of lignite	$N1= M \times P1$	Rs. Lakh	15866.08
19	Oil cost	$N2=P2 \times L/10^5$	Rs. Lakh	1094.87
20	Total fuel cost	$O= N1 + N2$	Rs. Lakh	16960.96
21	Fuel cost/Unit (Gross)	$P=O/(A*10)$	Rs/kWh	1.32
22	Fuel cost/Unit (Net)	$Q=O/(Y*10)$	Rs/kWh	1.50
23	Cost of fuel/Gcal	$R=(O/H)*10^5$	Rs./Gcal	400.23
24	Actual Auxiliary Consumption	C1	%	12.64%
25	Actual Auxiliary Consumption	$B1=A*C1$	MUs	162.37
26	Actual net generation	$S= A - B1$	MUs	1121.81
27	Normative Fuel Cost for actual Net Generation	$T=S*Q/10$	Rs. Crore	168.37



Approved fuel costs for 2015-16 for true-up
Fuel costs(Coal, Lignite &Secondary oil) -KLTPS 4

Sr. No.	Item	Derivation	Unit	2015-16
1	Gross Generation	A	MUs	322.52
2	Auxiliary Consumption	C	%	12.00%
3	Auxiliary Consumption	B	MUs	38.70
4	Net Generation	$Y=A-B$	MUs	283.82
5	Station Heat Rate	D	Kcal/kWh	3000
6	Sp. Oil Consumption	E	ml/kWh	3.00
7	Gross calorific value of coal	F	Kcal/Kg	2841
8	Calorific value of oil	G	Kcal/l	10606.00
9	Overall Heat	$H= A \times D$	Gcal	967560.00
10	Heat from Oil	$I= (A \times E \times G)/1000$	Gcal	10261.94
11	Heat from Coal	$J = H-I$	Gcal	957298.06
12	Transit losses	K	%	0.20%
13	Actual oil consumption	$L= A \times E$	Kl	967.56
14	Actual Coal consumption	$M= (J \times 1000)/F$	MT	336958.13
15	Coal consumption incl. transit losses	$N=M/(1-K)$	MT	337633.40
16	Price of lignite	P1	Rs./MT	1087.75
17	Price of oil	P2	Rs./Kl	44458.81
18	Cost of lignite	$N1= M \times P1$	Rs. Lakh	3665.26
19	Oil cost	$N2=P2 \times L/10^5$	Rs. Lakh	430.17
20	Total fuel cost	$O= N1 + N2$	Rs. Lakh	4095.42
21	Fuel cost/Unit (Gross)	$P=O/(A*10)$	Rs/kWh	1.27
22	Fuel cost/Unit (Net)	$Q=O/(Y*10)$	Rs/kWh	1.44
23	Cost of fuel/Gcal	$R=(O/H)*10^5$	Rs./Gcal	423.27
24	Actual Auxiliary Consumption	C1	%	21.39%
25	Actual Auxiliary Consumption	$B1=A*C1$	MUs	68.98
26	Actual net generation	$S= A - B1$	MUs	253.54
27	Normative Fuel Cost for actual Net Generation	$T=S*Q/10$	Rs. Crore	36.59



Approved fuel costs for 2015-16 for true-up
Fuel costs(Coal, Lignite &Secondary oil) - Utran Extension

Sr. No.	Item	Derivation	Unit	2015-16
1	Gross Generation	A	MUs	1271.97
2	Auxiliary Consumption	C	%	3.00%
3	Auxiliary Consumption	B	MUs	38.16
4	Net Generation	$Y=A-B$	MUs	1233.81
5	Station Heat Rate	D	Kcal/kWh	1850
6	Calorific value of gas	F	Kcal/Scm	9549
7	Overall heat from gas	$H= A \times D$	Gcal	2353144.50
8	Actual gas consumption	$M= (H \times 1000)/F$	M. scm	246.43
9	Price of gas	P1	Rs/scm	21.73
10	Cost of gas	$N5=P1 \times M$	Rs.M	5354.17
11	Total fuel cost	N5	Rs.M	5354.17
12	Fuel cost/unit (Gross)	$P=N5/(A*10)$	Rs/kWh	4.21
13	Fuel cost/unit (Net)	$Q=N5/(Y*10)$	Rs/kWh	4.34
14	Cost of fuel/G.Cal	$R=(N5/H)*10^5$	Rs/Gcal	2275.33
15	Actual Auxiliary Consumption	C1	%	2.70%
16	Actual Auxiliary Consumption	$B1=A*C1$	MUs	34.38
17	Actual net generation	$S= A - B1$	MUs	1237.59
18	Normative Fuel Cost for actual Net Generation	$T=S*Q/10$	Rs. Crore	537.06



Approved fuel costs for 2015-16 for true-up
Fuel costs(Coal, Lignite &Secondary oil) - Dhuvaran CCPP 1

Sr. No.	Item	Derivation	Unit	2015-16
1	Gross Generation	A	MUs	91.60
2	Auxiliary Consumption	C	%	3.77%
3	Auxiliary Consumption	B	MUs	3.46
4	Net Generation	$Y=A-B$	MUs	88.14
5	Station Heat Rate	D	Kcal/kWh	1950
6	Calorific value of gas	F	Kcal/Scm	9581
7	Overall heat from gas	$H= A \times D$	Gcal	178620.00
8	Actual gas consumption	$M= (H \times 1000)/F$	M. scm	18.64
9	Price of gas	P1	Rs/scm	18.25
10	Cost of gas	$N5=P1 \times M/10^5$	Rs.M	340.31
11	Total fuel cost	N5	Rs.M	340.31
12	Fuel cost/unit (Gross)	$P=N5/(A*10)$	Rs/kWh	3.72
13	Fuel cost/unit (Net)	$Q=N5/(Y*10)$	Rs/kWh	3.86
14	Cost of fuel/G.Cal	$R=(N5/H)*10^6$	Rs/Gcal	1905.24
15	Actual Auxiliary Consumption	C1	%	10.36%
16	Actual Auxiliary Consumption	$B1=A*C1$	MUs	9.49
17	Actual net generation	$S= A - B1$	MUs	82.11
18	Normative Fuel Cost for actual Net Generation	$T=S*Q/10$	Rs. Crore	31.70



Approved fuel costs for 2015-16 for true-up
Fuel costs(Coal, Lignite &Secondary oil) - Dhuvaran CCPP 2

Sr. No.	Item	Derivation	Unit	2015-16
1	Gross Generation	A	MUs	325.33
2	Auxiliary Consumption	C	%	3.00%
3	Auxiliary Consumption	B	MUs	9.76
4	Net Generation	$Y=A-B$	MUs	315.57
5	Station Heat Rate	D	Kcal/kWh	1950
6	Calorific value of gas	F	Kcal/Scm	9564
7	Overall heat from gas	$H= A \times D$	Gcal	634393.50
8	Actual gas consumption	$M= (H \times 1000)/F$	M. scm	66.33
9	Price of gas	P1	Rs/scm	19.26
10	Cost of gas	$N5=P1 \times M/10^5$	Rs.M	1277.22
11	Total fuel cost	N5	Rs.M	1277.22
12	Fuel cost/unit (Gross)	$P=N5/(A*10)$	Rs/kWh	3.93
13	Fuel cost/unit (Net)	$Q=N5/(Y*10)$	Rs/kWh	4.05
14	Cost of fuel/G.Cal	$R=(N5/H)*10^5$	Rs/Gcal	2013.29
15	Actual Auxiliary Consumption	C1	%	4.89%
16	Actual Auxiliary Consumption	$B1=A*C1$	MUs	15.92
17	Actual net generation	$S= A - B1$	MUs	309.41
18	Normative Fuel Cost for actual Net Generation	$T=S*Q/10$	Rs. Crore	125.23



Approved fuel costs for 2015-16 for true-up
Fuel costs(Coal, Lignite &Secondary oil) - Sikka 3 & 4

Sr. No.	Item	Derivation	Unit	2015-16
1	Gross Generation	A	MUs	555.11
2	Auxiliary Consumption	C	%	9.00%
3	Auxiliary Consumption	B	MUs	49.96
4	Net Generation	$Y=A-B$	MUs	505.15
5	Station Heat Rate	D	Kcal/kWh	2398
6	Sp. Oil Consumption	E	ml/kWh	1.00
7	Gross calorific value of coal	F	Kcal/Kg	5230
8	Calorific value of oil	G	Kcal/l	10249.72
9	Overall Heat	$H= A \times D$	Gcal	1331152.90
10	Heat from Oil	$I= (A \times E \times G)/1000$	Gcal	5689.72
11	Heat from Coal	$J = H-I$	Gcal	1325463.18
12	Transit losses	K	%	0.00%
13	Coal Blend			
14	(A) Indigenous coal	X1	%	0.00%
15	(B) Washed Coal	X2	%	0.00%
16	(c) Imported Coal	X3	%	100%
17	Actual oil consumption	$L= A \times E$	Kl	555.10
18	Actual Coal consumption	$M= (J \times 1000)/F$	MT	253434.64
19	(A) Indigenous coal	$Q1=M^* \times X1/(1-K)$	MT	0.00
20	(B) Washed Coal	$Q2=M^* \times X2 / (1-K)$	MT	0.00
21	(c) Imported Coal	$Q3=M^* \times X3$	MT	253434.64
22	Price of coal			
23	(A) Indigenous coal	P1	Rs./MT	0.00
24	(B) Washed Coal	P2	Rs./MT	0.00
25	(c) Imported Coal	P3	Rs./MT	4818.71
26	Price of oil	P4	Rs./Kl	23936.01
27	Coal Cost			
28	(A) Indigenous coal	$N1=Q1 \times P1$	Rs.Lakh	0.00
29	(B) Washed Coal	$N2=Q2 \times P2$	Rs.Lakh	0.00
30	(c) Imported Coal	$N3=Q3 \times P3$	Rs.Lakh	12212.27
31	Total coal cost	$N4= N1+N2+N3$	Rs.Lakh	12212.27
32	Oil Cost	$N5=P4 \times L/10^5$	Rs.Lakh	132.87
33	Total fuel cost	$O= N4+N5$	Rs.Lakh	12345.14
34	Fuel cost/Unit (Gross)	$P= O/(A*10)$	Rs/kWh	2.22
35	Fuel cost/Unit (Net)	$Q=O/(Y*10)$	Rs/kWh	2.44
36	Cost of fuel/G.Cal	$R=(O/H)*10^5$	Rs./Gcal	927.40
37	Actual Auxiliary Consumption	C1	%	12.16%
38	Actual Auxiliary Consumption	$B1=A*C1$	MUs	67.48
39	Actual net generation	$S= A - B1$	MUs	487.63
40	Normative Fuel Cost for actual Net Generation	$T=S*Q/10$	Rs. Crore	119.17



Approved fuel costs for 2015-16 for true-up
Fuel costs(Coal, Lignite &Secondary oil) - Dhuvaran CCPP 3

Sr. No.	Item	Derivation	Unit	2015-16
1	Gross Generation	A	MUs	0.00
2	Auxiliary Consumption	C	%	3%
3	Auxiliary Consumption	B	MUs	0.00
4	Net Generation	$Y=A-B$	MUs	0.00
5	Station Heat Rate	D	Kcal/kWh	1850
6	Calorific value of gas	F	Kcal/Scm	9700
7	Overall heat from gas	$H= A \times D$	Gcal	0.00
8	Actual gas consumption	$M= (H \times 1000)/F$	M. scm	0.00
9	Price of gas	P1	Rs/scm	11.62
10	Cost of gas	$N5=P1 \times M/10^5$	Rs.M	0.00
11	Total fuel cost	N5	Rs.M	0.00
12	Fuel cost/unit (Gross)	$P=N5/(A*10)$	Rs/kWh	0.00
13	Fuel cost/unit (Net)	$Q=N5/(Y*10)$	Rs/kWh	0.00
14	Cost of fuel/G.Cal	$R=(N5/H)*10^5$	Rs/Gcal	0.00
15	Actual Auxiliary Consumption	C1	%	0.00%
16	Actual Auxiliary Consumption	$B1=A*C1$	MUs	0.00
17	Actual net generation	$S= A - B1$	MUs	0.00
18	Normative Fuel Cost for actual Net Generation	$T=S*Q/10$	Rs. Crore	0.00



5 GSECL Generating Stations and their Performance for MYT Period FY 2016-17 to FY 2020-21

5.1 Generating Stations of GSECL

The details of the existing stations of GSECL along with their capacities and date of commissioning are given in Table 5.1 below:

Table 5.1: Capacity, COD & Age of GSECL generating stations as on 1st April, 2016

Name of station	Unit No.	Capacity of the unit (MW)	Date of Commissioning	Age as on 01/04/2016 (Years)
Ukai	1	120	19/03/1976	40
	2	120	23/06/1976	40
	3	200	21/01/1979	37
	4	200	11/09/1979	37
	5	210	30/01/1985	32
Sub total		850		
Gandhinagar	1	120	13/03/1977	39
	2	120	10/04/1977	39
	3	210	20/03/1990	26
	4	210	20/07/1991	25
	5	210	17/03/1998	18
Sub total		870		
Wanakbori	1	210	25/03/1982	34
	2	210	15/01/1983	33
	3	210	15/03/1984	32
	4	210	09/03/1986	30
	5	210	23/09/1986	30
	6	210	18/11/1987	28
	7	210	31/12/1998	17
Sub total		1470		
Sikka	1	120	26/03/1988	29
	2	120	31/03/1993	23
Sub total		240		
KLTPS	1	70	29/03/1990	26
	2	70	25/03/1991	25
	3	75	31/03/1997	19
	4	75	20/12/2009	7
Sub total		290		



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Name of station	Unit No.	Capacity of the unit (MW)	Date of Commissioning	Age as on 01/04/2016 (Years)
Dhuvaran	7 – Gas	106.617	28/01/2004	12
	8 - Gas	112.45	01/11/2007	8
Sub total		219.067		
Utran	GT - 1	30	17/12/1992	23
	GT - 2	30	28/12/1992	23
	GT - 3	30	07/05/1993	23
	STG	45	17/07/1993	23
Sub total		135		
Utran Extension	GT - 1	375	08/11/2009	7
Sikka TPS 3&4	3	250	14/9/2015	1
	4	250	28/12/2015	1
		500		
Dhuvaran (Gas)	3	376		
Sub Total GSECL (Coal + Lignite)		4720		
Sub Total GSECL (Gas)		1105		
Total GSECL (Thermal)		5825		
Ukai Hydro	1	75	08/017/1974	42
	2	75	13/12/1974	41
	3	75	22/04/1975	41
	4	75	04/03/1976	40
Sub total		300		
Ukai LBC	1	2.5	08/12/1987	22
	2	2.5	19/02/1988	22
Sub total		5		
Kadana Hydro	1	60	31/03/1990	20
	2	60	02/09/1990	20
	3	60	03/01/1998	12
	4	60	27/05/1998	12
Sub total		240		
Panam	1	1	24/03/1994	16
	2	1	31/03/1994	16
Sub total		2		
Sub Total GSECL (Hydro)		547		
Wind Mills		10		1
Solar	Plant at GTPS (Ash Dyke)	1	27/03/2012	4



Name of station	Unit No.	Capacity of the unit (MW)	Date of Commissioning	Age as on 01/04/2016 (Years)
	Plant at Sanand branch Canal	1	29/03/2012	4
	Charanka	10	23/03/2015	1
Total capacity of GSECL		6393.74		

As per GERC (MYT) Regulations, 2016, GSECL has to file a separate petition for approval of ARR and Tariff for units / stations commissioned during the MYT period.

The performance parameters for the existing stations are discussed in the following paras.

Among the existing stations, it is stated by GSECL that the GTPS Unit 1&2 are decommissioned in FY 2016-17.

5.2 Performance of Generating Stations, GSECL's projections for the MYT period and Commission's Analysis and Decisions

The actual performance of the stations for the FY 2015-16 as provided by GSECL and the Commission's analysis and decisions are already discussed in Chapters 4 in the truing up for FY 2015-16.

Power generating stations are broadly governed by the following operational parameters:

- Station heat rate
- Plant availability factor
- Plant load factor
- Specific fuel oil consumption
- Auxiliary consumption

The above operating parameters are dependent on various technical factors like design, level of operation (low/partial load operation), ageing etc. The justification for the operational parameters has been discussed in detail in the subsequent sections.



Low PLF: The performance of generating stations depends on the generation level of the units as well as plant load factor. In Gujarat, the Intra State ABT / Merit order Despatch System is followed. In Gujarat, a power surplus state, the despatch instructions for a generating station depend upon the merit order (low cost generation is given priority) as per the Indian Electricity Grid Code. Accordingly, GSECL stations are advised to back down or put under Reserve Shut Down depending upon system requirements. This results in lower plant load factor (PLF) of GSECL stations which is beyond the control of GSECL.

Effects of low load operation/back down: Partial load / low load operation results in deterioration in overall performance of the units and lowers efficiency of power stations. Following performance issues can be attributed to the low load operation of generating stations:

- Increase in station heat rate (SHR)
- Increase in fuel consumption
- Increase in specific fuel oil consumption (increase in no. of hot/cold start ups increases the fuel oil consumption)
- Increase in auxiliary consumption

GSECL claimed that these factors are beyond its control and it pleaded the Commission for approval of the operating parameters as projected in the petition for the MYT period FY 2016-17 to FY 2020-21 taking into consideration all the factors mentioned above.

GSECL submitted that minor R&M projects are taken up to improve the automatic control systems and instrumentation of the old plants for replacing obsolete system to sustain performance.

The Commission has considered the vintage of GSECL thermal plant, constraints in the operation of the plant etc., and fixed certain operation parameters for each of the stations for the control period FY 2016-17 to FY 2020-21 in the GERC (MYT) Regulations, 2016. These parameters are considered in determining the tariff during the control period.

The projections of GSECL for the control period and the analysis of the Commission are discussed hereunder, parameter wise.



5.2.1 Plant Availability

Petitioner's Submission

GSECL has submitted the plant availability factor for all the stations for the control period as given in the Table below:

Table 5.2: Projected Plant Availability Factors for FY 2016-17 to FY 2020-21 (%)

Sr. No.	Power station	2016-17	2017-18	2018-19	2019-20	2020-21
1	Ukai (1-5)	54.60%	80.00%	80.00%	77.00%	77.00%
2	Gandhinagar (1-4)	81.90%	80.00%	80.00%	80.00%	80.00%
3	Wanakbori 1-6 TPS	85.00%	85.00%	85.00%	75.00%	82.00%
4	Sikka TPS	80.00%	80.00%	-	-	-
5	KLTPS 1-3	75.00%	75.00%	75.00%	75.00%	75.00%
6	KLTPS 4	75.60%	80.00%	80.00%	80.00%	80.00%
7	Dhuvaran CCPP 2	80.00%	80.00%	80.00%	80.00%	80.00%
8	Ukai Hydro	80.00%	80.00%	80.00%	80.00%	80.00%
9	Kadana Hydro	80.00%	80.00%	80.00%	80.00%	80.00%
10	Ukai Extn. 6*	85.00%	85.00%	85.00%	85.00%	85.00%
11	Gandhinagar 5*	80.00%	80.00%	80.00%	80.00%	80.00%
12	Wanakbori 7 TPS*	77.00%	80.00%	80.00%	80.00%	80.00%
13	Dhuvaran CCPP 1*	80.00%	80.00%	80.00%	80.00%	80.00%
14	Dhuvaran CCPP 3*	80.00%	85.00%	85.00%	85.00%	85.00%
15	Utran (Gas)*	80.00%	-	-	-	-
16	Utran Extension*	80.00%	80.00%	80.00%	80.00%	80.00%
17	Sikka Extn. (3-4)*	80.40%	85.00%	85.00%	85.00%	85.00%
18	Wanakbori 8 TPS*	-	-	85.00%	85.00%	85.00%
19	Dhuvaran STPS*	-	-	-	-	85.00%

* PPA based stations

PAF for PPA based stations for recovery of full fixed cost will be as per Terms and Conditions of PPA.

Commission's Analysis

The Commission has analyzed the submission made by the petitioner, the vintage of the machines, past performance etc. For PPA based stations the PAF will be approved as per the PPA signed. For other stations, PAF is approved better of the GERC (MYT) Regulations, 2016 or as submitted by petitioner. The approved PAF for different stations, taking into account the GERC (MYT) Regulations, 2016 and submission by petitioner, is as given in Table below:



**Table 5.3: Approved Plant Availability Factors for control period
FY 2016-17 to FY 2020-21**

						(%)
Sr. No.	Power station	2016-17	2017-18	2018-19	2019-20	2020-21
1	Ukai (1-5)	80.00%	80.00%	80.00%	80.00%	80.00%
2	Gandhinagar (1-4)	84.00%	84.00%	84.00%	84.00%	84.00%
3	Wanakbori 1-6 TPS	85.00%	85.00%	85.00%	85.00%	85.00%
4	Sikka TPS	80.0%	80.00%	-	-	-
5	KLTPS 1-3	75.00%	75.00%	75.00%	75.00%	75.00%
6	KLTPS 4	80.00%	80.00%	80.00%	80.00%	80.00%
7	Dhuvaran CCPP 2	85.00%	85.00%	85.00%	85.00%	85.00%
8	Ukai Hydro	80.00%	80.00%	80.00%	80.00%	80.00%
9	Kadana Hydro	80.00%	80.00%	80.00%	80.00%	80.00%
10	Ukai Extn. 6*	85.00%	85.00%	85.00%	85.00%	85.00%
11	Gandhinagar 5*	85.00%	85.00%	85.00%	85.00%	85.00%
12	Wanakbori 7 TPS*	85.00%	85.00%	85.00%	85.00%	85.00%
13	Dhuvaran CCPP 1*	85.00%	85.00%	85.00%	85.00%	85.00%
14	Dhuvaran CCPP 3*	85.00%	85.00%	85.00%	85.00%	85.00%
15	Utran (Gas)*	85.00%	00.00%	00.00%	00.00%	00.00%
16	Utran Extension*	85.00%	85.00%	85.00%	85.00%	85.00%
17	Sikka Extn. (3-4)*	85.00%	85.00%	85.00%	85.00%	85.00%
18	Wanakbori 8 TPS*	-	-	85.00%	85.00%	85.00%
19	Dhuvaran STPS*	-	-	-	-	85.00%

* PPA based stations

5.2.2 Plant Load Factor

GSECL has projected the Plant Load Factors for all the stations for the control period as given in Table below:

Table 5.4: Projected Plant Load Factors for control period FY 2016-17 to FY 2020-21

						(%)
Sr. No.	Power station	2016-17	2017-18	2018-19	2019-20	2020-21
1	Ukai (1-5)	39.00%	60.00%	60.00%	56.00%	58.00%
2	Gandhinagar (1-4)	38.00%	45.00%	45.00%	45.00%	45.00%
3	Wanakbori 1-6 TPS	42.00%	55.00%	52.00%	50.00%	50.00%
4	Sikka TPS	27.00%	40.00%	-	-	-
5	KLTPS 1-3	75.00%	75.00%	75.00%	75.00%	75.00%
6	KLTPS 4	72.00%	75.00%	75.00%	75.00%	75.00%
7	Dhuvaran CCPP 2	21.00%	25.00%	25.00%	25.00%	25.00%
8	Ukai Hydro	13.00%	13.00%	13.00%	13.00%	13.00%
9	Kadana Hydro	6.00%	6.00%	6.00%	6.00%	6.00%
10	Ukai Extn. 6*	73.00%	77.00%	77.00%	77.00%	77.00%
11	Gandhinagar 5*	70.00%	77.00%	77.00%	77.00%	77.00%



Sr. No.	Power station	2016-17	2017-18	2018-19	2019-20	2020-21
12	Wanakbori 7 TPS*	55.00%	70.00%	70.00%	70.00%	70.00%
13	Dhuvaran CCPP 1*	21.00%	25.00%	25.00%	25.00%	25.00%
14	Dhuvaran CCPP 3*	21.00%	25.00%	25.00%	25.00%	25.00%
15	Utran (Gas)*	21.00%	-	-	-	-
16	Utran Extension*	21.00%	25.00%	25.00%	25.00%	25.00%
17	Sikka Extn. (3-4)*	59.00%	70.00%	70.00%	70.0%	70.0%
18	Wanakbori 8 TPS*	-	-	85.00%	85.0%	85.0%
19	Dhuvaran STPS*	-	-	-	-	85.0%

* PPA based stations

Commission's Analysis

The Commission acknowledges the fact that PLF of a generating station depends upon the schedules given by the Distribution Licensees. The Commission has also noted the performance of the plants in FY 2015-16. Keeping this in mind and considering the PAFs approved, constraints in operation of some of the generating stations, and their past performance, the Commission approves the station-wise PLF as given in Table below:

Table 5.5: Approved Plant Load Factors for control period FY 2016-17 to FY 2020-21

(%)

Sr. No.	Power station	2016-17	2017-18	2018-19	2019-20	2020-21
1	Ukai (1-5)	39.00%	60.00%	60.00%	56.00%	58.00%
2	Gandhinagar (1-4)	38.00%	45.00%	45.00%	45.00%	45.00%
3	Wanakbori 1-6 TPS	42.00%	55.00%	52.00%	50.00%	50.00%
4	Sikka TPS	27.00%	40.00%	-	-	-
5	KLTPS 1-3	75.00%	75.00%	75.00%	75.00%	75.00%
6	KLTPS 4	72.00%	75.00%	75.00%	75.00%	75.00%
7	Dhuvaran CCPP 2	21.00%	25.00%	25.00%	25.00%	25.00%
8	Ukai Hydro	13.00%	13.00%	13.00%	13.00%	13.00%
9	Kadana Hydro	6.00%	6.00%	6.00%	6.00%	6.00%
10	Ukai Extn. 6*	73.00%	77.00%	77.00%	77.00%	77.00%
11	Gandhinagar 5*	70.00%	77.00%	77.00%	77.00%	77.00%
12	Wanakbori 7 TPS*	55.00%	70.00%	70.00%	70.00%	70.00%
13	Dhuvaran CCPP 1*	21.00%	25.00%	25.00%	25.00%	25.00%
14	Dhuvaran CCPP 3*	21.00%	25.00%	25.00%	25.00%	25.00%
15	Utran (Gas)*	21.00%	-	-	-	-
16	Utran Extension*	21.00%	25.00%	25.00%	25.00%	25.00%



Sr. No.	Power station	2016-17	2017-18	2018-19	2019-20	2020-21
17	Sikka Extn. (3-4)*	59.00%	70.00%	70.00%	70.00%	70.00%
18	Wanakbori 8 TPS*	-	-	85.00%	85.00%	85.00%
19	Dhuvaran STPS*	-	-	-	-	85.00%

* PPA based stations

It is to clarify here that for the purpose of incentive calculation during truing up, the PLF shall be considered as per Regulation 53.2 of the GERC (MYT) Regulations, 2016.

5.2.3 Auxiliary Consumption

Petitioner's Submission

GSECL has projected the auxiliary consumption for all the stations for the control period as given in Table below:

Table 5.6: Projected Auxiliary Consumption for the control period FY 2016-17 to FY 2020-21

(%)						
Sr. No.	Power station	2016-17	2017-18	2018-19	2019-20	2020-21
1	Ukai (1-5)	10.00%	10.00%	10.00%	10.00%	10.00%
2	Gandhinagar (1-4)	10.00%	10.00%	10.00%	10.00%	10.00%
3	Wanakbori 1-6 TPS	9.50%	9.50%	9.50%	9.50%	9.50%
4	Sikka TPS	12.50%	12.00%	-	-	-
5	KLTPS 1-3	13.00%	13.00%	13.00%	13.00%	13.00%
6	KLTPS 4	19.00%	16.00%	16.00%	16.00%	16.00%
7	Dhuvaran CCPP 2	6.00%	6.00%	6.00%	6.00%	6.00%
8	Ukai Hydro	0.70%	0.70%	0.70%	0.70%	0.70%
9	Kadana Hydro	1.19%	1.19%	1.19%	1.19%	1.19%
10	Ukai Extn. 6*	6.00%	6.00%	6.00%	6.00%	6.00%
11	Gandhinagar 5*	9.50%	9.50%	9.50%	9.50%	9.50%
12	Wanakbori 7 TPS*	9.50%	9.50%	9.50%	9.50%	9.50%
13	Dhuvaran CCPP 1*	6.00%	6.00%	6.00%	6.00%	6.00%
14	Dhuvaran CCPP 3*	3.00%	3.00%	3.00%	3.00%	3.00%
15	Utran (Gas)*	4.00%	-	-	-	-
16	Utran Extension*	3.00%	3.00%	3.00%	3.00%	3.00%
17	Sikka Extn. (3-4)*	10.00%	9.50%	9.50%	9.50%	9.50%
18	Wanakbori 8 TPS*	-	-	5.25%	5.25%	5.25%
19	Dhuvaran STPS*	-	-	-	-	5.25%

* PPA based stations

GSECL has submitted that the consumption of gas booster compressor is to be considered at actuals as approved by the Commission for Dhuvaran CCPP 1.



Furthermore, the old stations of GSECL, when operated at part load capacities under the constraints as shown, consume more auxiliary power resulting in higher auxiliary consumption.

As per petition submitted by GSECL, the factors impacting auxiliary consumption of GSECL stations & reasons for deviation from norms are as below:

- **Ukai 1-5:** Anticipated Partial load operation due to backing down and Aux. consumption during RSD
- **Wanakbori 1-6:** Anticipated Partial load operation due to backing down and Aux. consumption during RSD
- **Sikka 1-2:** Anticipated Partial load operation due to backing down and Aux. consumption during RSD
- **Sikka 3-4:** Units under stabilization, anticipated Partial load operation due to backing down and Aux. consumption during RSD
- **KLTPS 1-3:** Anticipated partial load operation due to backing down and Aux. consumption during RSD
- **KLTPS 4:** Unit design Aux. consumption is 16%
- **Ukai Hydro:** The units are available but operated as per Irrigation department requirement
- **Kadana Hydro:** The units are available but operated as per Irrigation department requirement

Due to constraints mentioned above, GSECL has pleaded Commission to approve the projected auxiliary consumption.

Commission's Analysis

The Commission has analyzed the auxiliary consumption pattern for all the stations. Though GSECL has requested the commission to consider the vintage of the machine, regular start up and shut down, backing down due to no or low dispatch etc. in approving the auxiliary consumption, the Commission has already considered these factors while deciding aux. consumption for power plants in GERC (MYT) Regulations, 2016.

For GTPS station, as Unit 1 & 2 are already decommissioned in FY17, the remaining machines are comparable to Wanakbori station. Hence, the Commission is of the view



that the auxiliary consumption of GTPS and Wanakbori should be equivalent post FY17.

The auxiliary consumption for PPA governed stations is approved based on respective PPAs. In the case of other stations, auxiliary consumption is approved based on the GERC (MYT) Regulations, 2016 or as submitted by petitioner.

The consumption by gas booster compressor in case of Dhuvaran CCPP 1 is to be allowed as per actuals during true-up. However, for projections 1% over and above as allowed under MYT Regulations, 2016 is approved. GSECL should submit the actual consumption during the truing up.

The auxiliary consumption for different stations is approved for the control period FY 2016-17 to FY 2020-21 as given in Table below:

Table 5.7: Approved Auxiliary Consumption for the control period FY 2016-17 to FY 2020-21

						(%)
Sr. No.	Power station	2016-17	2017-18	2018-19	2019-20	2020-21
1	Ukai (1-5)	9.00%	9.00%	9.00%	9.00%	9.00%
2	Gandhinagar (1-4)	9.50%	9.00%	9.00%	9.00%	9.00%
3	Wanakbori 1-6 TPS	9.00%	9.00%	9.00%	9.00%	9.00%
4	Sikka TPS	11.00%	11.00%	-	-	-
5	KLTPS 1-3	12.00%	12.00%	12.00%	12.00%	12.00%
6	KLTPS 4	12.00%	12.00%	12.00%	12.00%	12.00%
7	Dhuvaran CCPP 2	3.00%	3.00%	3.00%	3.00%	3.00%
8	Ukai Hydro	0.60%	0.60%	0.60%	0.60%	0.60%
9	Kadana Hydro	1.00%	1.00%	1.00%	1.00%	1.00%
10	Ukai Extn. 6*	6.00%	6.00%	6.00%	6.00%	6.00%
11	Gandhinagar 5*	9.50%	9.50%	9.50%	9.50%	9.50%
12	Wanakbori 7 TPS*	9.50%	9.50%	9.50%	9.50%	9.50%
13	Dhuvaran CCPP 1*	4.00%	4.00%	4.00%	4.00%	4.00%
14	Dhuvaran CCPP 3*	3.00%	3.00%	3.00%	3.00%	3.00%
15	Utran (Gas)*	2.90%	-	-	-	-
16	Utran Extension*	3.00%	3.00%	3.00%	3.00%	3.00%
17	Sikka Extn. (3-4)*	9.00%	9.00%	9.00%	9.00%	9.00%
18	Wanakbori 8 TPS*	-	-	5.25%	5.25%	5.25%
19	Dhuvaran STPS*	-	-	-	-	5.25%

* PPA governed stations



5.2.4 Station Heat Rate (SHR)

Petitioner's Submission

GSECL projected the SHR of different stations for the control period FY 2016-17 to FY 2020-21 as given in the Table below:

Table 5.8: Projected Station Heat Rates for the control period FY 2016-17 to FY 2020-21

(Kcal/kWh)						
Sr. No.	Power station	2016-17	2017-18	2018-19	2019-20	2020-21
1	Ukai (1-5)	2750	2715	2715	2675	2625
2	Gandhinagar (1-4)	2679	2679	2679	2679	2679
3	Wanakbori 1-6 TPS	2675	2675	2650	2650	2600
4	Sikka TPS	3050	3015	-	-	-
5	KLTPS 1-3	3250	3250	3250	3250	3250
6	KLTPS 4	3100	3050	3050	3050	3050
7	Dhuvaran CCPP 2	2000	2000	2000	2000	2000
8	Ukai Hydro	-	-	-	-	-
9	Kadana Hydro	-	-	-	-	-
10	Ukai Extn. 6*	2500	2500	2500	2500	2500
11	Gandhinagar 5*	2525	2525	2525	2525	2525
12	Wanakbori 7 TPS*	2520	2500	2500	2500	2500
13	Dhuvaran CCPP 1*	2100	2075	2075	2075	2075
14	Dhuvaran CCPP 3*	1850	1850	1850	1850	1850
15	Utran (Gas)*	2150	-	-	-	-
16	Utran Extension*	1850	1850	1850	1850	1850
17	Sikka Extn. (3-4)*	2650	2600	2550	2550	2550
18	Wanakbori 8 TPS*	-	-	2248	2248	2248
19	Dhuvaran STPS*	-	-	-	-	2248

* PPA governed stations

The projections for PPA governed stations are based on the respective PPAs.

In case of other stations, GSECL submitted that it has considered the past performance of its plants for arriving at the projection of SHR for the control period FY 2016-17 to FY 2020-21.

GSECL has also submitted various reasons for high SHR in projection period as below:

- **Ukai 1-5:** Expected improvement after R & M, however will depend upon the PG test results post R&M



- **Ukai 6:** Anticipated partial load operation due to backing down
- **Wanakbori 1-6:** Backing down, expected improvement after R&M, however actual will depend upon the PG test results post R&M
- **Sikka 1-2:** Anticipated partial load operation due to backing down
- **Sikka 3-4:** Units under stabilization, anticipated low schedule
- **KLTPS 1-3:** Anticipated partial load operation due to backing down
- **KLTPS 4:** Anticipated partial load operation due to backing down
- **Dhuvaran CCPP2:** Anticipated partial load operation due to backing down

Commission's Analysis

In the case of PPA governed stations, the SHR is approved based on the terms of the respective PPAs. In the case of other stations, the heat rate is approved better of the GERC (MYT) Regulations, 2016 or as submitted by petitioner.

For Ukai TPS, GSECL has projected lower SHR as compared to SHR in GERC (MYT) Regulations, 2016 in view of R&M activities planned. The Commission has considered the projection of SHR for Ukai TPS as submitted by the petitioner.

For GTPS station, as Unit 1 & 2 are decommissioned in FY17, the remaining machines are comparable to Wanakbori station. Hence, the Commission is of the view that the SHR of both GTPS and Wanakbori should be equivalent post FY17.

The SHR approved by the Commission for all the stations for the control period FY 2016-17 to FY 2020-21, are given in Table below:

Table 5.9: Approved Station Heat Rates for the control period FY 2016-17 to FY 2020-21 (Kcal/kWh)

Sr. No.	Power station	2016-17	2017-18	2018-19	2019-20	2020-21
1	Ukai (1-5)	2750	2715	2715	2675	2625
2	Gandhinagar (1-4)	2650	2625	2625	2625	2625
3	Wanakbori 1-6 TPS	2625	2625	2625	2625	2600
4	Sikka TPS	3008	3003	-	-	-
5	KLTPS 1-3	3231	3231	3231	3231	3231
6	KLTPS 4	3000	3000	3000	3000	3000
7	Dhuvaran CCPP 2	1950	1950	1950	1950	1950
8	Ukai Hydro	-	-	-	-	-
9	Kadana Hydro	-	-	-	-	-
10	Ukai Extn. 6*	2385	2385	2385	2385	2385
11	Gandhinagar 5*	2460	2460	2460	2460	2460
12	Wanakbori 7 TPS*	2460	2460	2460	2460	2460



Sr. No.	Power station	2016-17	2017-18	2018-19	2019-20	2020-21
13	Dhuvaran CCPP 1*	1950	1950	1950	1950	1950
14	Dhuvaran CCPP 3*	1850	1850	1850	1850	1850
15	Utran (Gas)*	2150	0	0	0	0
16	Utran Extension*	1850	1850	1850	1850	1850
17	Sikka Extn. (3-4)*	2398	2398	2398	2398	2398
18	Wanakbori 8 TPS*	-	-	2248	2248	2248
19	Dhuvaran STPS*	-	-	-	-	2248

* PPA based stations

5.2.5 Secondary Fuel Oil Consumption

Petitioner's Submission

GSECL has projected the Secondary Fuel Oil Consumption (SFC) for the control period FY 2016-17 to FY 2020-21 as given in Table below:

Table 5.10: Projected secondary fuel oil consumption for the control period FY 2016-17 to FY 2020-21

(ml/kWh)						
Sr. No.	Power station	2016-17	2017-18	2018-19	2019-20	2020-21
1	Ukai (1-5)	2.00	1.50	1.50	1.50	1.50
2	Gandhinagar (1-4)	1.50	1.50	1.50	1.50	1.50
3	Wanakbori 1-6 TPS	1.50	1.50	1.50	1.50	1.50
4	Sikka TPS	3.50	3.00	-	-	-
5	KLTPS 1-3	3.70	3.00	3.00	3.00	3.00
6	KLTPS 4	3.00	3.00	3.00	3.00	3.00
7	Dhuvaran CCPP 2	-	-	-	-	-
8	Ukai Hydro	-	-	-	-	-
9	Kadana Hydro	-	-	-	-	-
10	Ukai Extn. 6*	1.50	1.00	1.00	1.00	1.00
11	Gandhinagar 5*	3.50	3.50	3.50	3.50	3.50
12	Wanakbori 7 TPS*	3.50	3.50	3.50	3.50	3.50
13	Dhuvaran CCPP 1*	-	-	-	-	-
14	Dhuvaran CCPP 3*	-	-	-	-	-
15	Utran (Gas)*	-	-	-	-	-
16	Utran Extension*	-	-	-	-	-
17	Sikka Extn. (3-4)*	3.00	2.00	2.00	2.00	2.00
18	Wanakbori 8 TPS*	-	-	0.50	0.50	0.50
19	Dhuvaran STPS*	-	-	-	-	0.50

* PPA based stations



For PPA based stations, the secondary fuel oil consumption is projected based on the terms of the respective PPAs.

Regarding other stations, GSECL pleaded that the Specific Oil Consumption is calculated in terms of percentage of total calorific requirement of the power generating unit and has relation with the size of the generating unit. For the lower size units, the Specific Oil Consumption remains higher as compared to larger units, because certain amount of Specific Oil consumption remains fixed irrespective of the size of the generating unit. As most of the units of GSECL power stations are smaller in size, Specific Oil Consumption of these plants is generally high.

GSECL has submitted the factors impacting SFC of its stations & reasons for deviation from norms for MYT projections as below:

- **Ukai 1-5:** Start / stop due to RSD
- **Gandhinagar 5:** As per PPA
- **Wanakbori 1-6:** Start / stop due to RSD
- **Wanakbori 7:** As per PPA
- **Sikka 1-2:** Start / stop due to RSD
- **Sikka 3-4:** Units under stabilization
- **KLTPS 1-3:** Frequent start/stop due to RSD

Commission's Analysis

The secondary fuel oil consumption for PPA governed stations is approved according to PPA norms. For the other stations, the secondary fuel oil consumption is approved as per the GERC (MYT) Regulations, 2016.

For GTPS station, as Unit 1 & 2 are decommissioned in FY17, the remaining machines are comparable to Wanakbori station. Hence, Commission is of the view that the SFO consumption of both GTPS and Wanakbori should be equivalent post FY17.

The secondary fuel oil consumption for the control period FY 2016-17 to FY 2020-21 as approved by the Commission is given in Table 5.11 below:

Table 5.11: Approved secondary fuel oil consumption for the control period FY 2016-17 to FY 2020-21

(ml/kWh)						
Sr. No.	Power station	2016-17	2017-18	2018-19	2019-20	2020-21
1	Ukai (1-5)	1.00	1.00	1.00	1.00	1.00
2	Gandhinagar (1-4)	1.25	1.00	1.00	1.00	1.00
3	Wanakbori 1-6 TPS	1.00	1.00	1.00	1.00	1.00
4	Sikka TPS	3.00	3.00	0.00	0.00	0.00
5	KLTPS 1-3	3.00	3.00	3.00	3.00	3.00
6	KLTPS 4	3.00	3.00	3.00	3.00	3.00
7	Dhuvaran CCPP 2	-	-	-	-	-
8	Ukai Hydro	-	-	-	-	-
9	Kadana Hydro	-	-	-	-	-
10	Ukai Extn. 6*	1.00	1.00	1.00	1.00	1.00
11	Gandhinagar 5*	3.50	3.50	3.50	3.50	3.50
12	Wanakbori 7 TPS*	3.50	3.50	3.50	3.50	3.50
13	Dhuvaran CCPP 1*	-	-	-	-	-
14	Dhuvaran CCPP 3*	-	-	-	-	-
15	Utran (Gas)*	-	-	-	-	-
16	Utran Extension*	-	-	-	-	-
17	Sikka Extn. (3-4)*	1.00	1.00	1.00	1.00	1.00
18	Wanakbori 8 TPS*	-	-	0.50	0.50	0.50
19	Dhuvaran STPS*	-	-	-	-	0.50

* PPA governed stations

5.2.6 Transit Loss of coal

Petitioner's Submission

GSECL has projected the Transit Loss of coal for different stations for the control period FY 2016-17 to FY 2020-21 as given in Table 5.12 below:

Table 5.12: Projected Transit loss of coal for the FY 2016-17 to FY 2020-21

(%)						
Sr. No.	Power station	2016-17	2017-18	2018-19	2019-20	2020-21
1	Ukai (1-5)	0.80%	0.80%	0.80%	0.80%	0.80%
2	Gandhinagar (1-4)	0.80%	0.80%	0.80%	0.80%	0.80%
3	Wanakbori 1-6 TPS	0.80%	0.80%	0.80%	0.80%	0.80%
4	Sikka TPS	0.80%	0.80%	-	-	-
5	KLTPS 1-3	0.80%	0.80%	0.80%	0.80%	0.80%
6	KLTPS 4	0.80%	0.80%	0.80%	0.80%	0.80%
7	Dhuvaran CCPP 2	-	-	-	-	-



Sr. No.	Power station	2016-17	2017-18	2018-19	2019-20	2020-21
8	Ukai Hydro	-	-	-	-	-
9	Kadana Hydro	-	-	-	-	-
10	Ukai Extn. 6*	0.80%	0.80%	0.80%	0.80%	0.80%
11	Gandhinagar 5*	0.80%	0.80%	0.80%	0.80%	0.80%
12	Wanakbori 7 TPS*	0.80%	0.80%	0.80%	0.80%	0.80%
13	Dhuvaran CCPP 1*	-	-	-	-	-
14	Dhuvaran CCPP 3*	-	-	-	-	-
15	Utran (Gas)*	-	-	-	-	-
16	Utran Extension*	-	-	-	-	-
17	Sikka Extn. (3-4)*	0.00%	0.00%	0.00%	0.00%	0.00%
18	Wanakbori 8 TPS*	-	-	0.80%	0.80%	0.80%
19	Dhuvaran STPS*	-	-	-	-	0.80%

* PPA based stations

GSECL projected the Transit Loss of coal as per Regulations for other than pit head stations at 0.80%. For pit head stations KLTPS 1-3 and KLTPS 4, 0.80% is projected, whereas 0.20% is allowed as per GERC (MYT) Regulations, 2016.

Commission's Analysis

Sikka Extn. 3 & 4 being imported coal station, Petitioner has not claimed any transit loss. The Commission hereby approves the transit loss for all the stations as per GERC (MYT), Regulations, 2016 i.e. 0.80% for non-pit head stations and 0.20% for pithead stations including lignite based stations as given in Table-5.13 below:

Table 5.13: Transit loss of coal Approved for the FY 2016-17 to FY 2020-21

(%)						
Sr. No.	Power station	2016-17	2017-18	2018-19	2019-20	2020-21
1	Ukai (1-5)	0.80%	0.80%	0.80%	0.80%	0.80%
2	Gandhinagar (1-4)	0.80%	0.80%	0.80%	0.80%	0.80%
3	Wanakbori 1-6 TPS	0.80%	0.80%	0.80%	0.80%	0.80%
4	Sikka TPS	0.80%	0.80%	-	-	-
5	KLTPS 1-3	0.20%	0.20%	0.20%	0.20%	0.20%
6	KLTPS 4	0.20%	0.20%	0.20%	0.20%	0.20%
7	Dhuvaran CCPP 2	-	-	-	-	-
8	Ukai Hydro	-	-	-	-	-
9	Kadana Hydro	-	-	-	-	-
10	Ukai Extn. 6*	0.80%	0.80%	0.80%	0.80%	0.80%
11	Gandhinagar 5*	0.80%	0.80%	0.80%	0.80%	0.80%
12	Wanakbori 7 TPS*	0.80%	0.80%	0.80%	0.80%	0.80%
13	Dhuvaran CCPP 1*	-	-	-	-	-
14	Dhuvaran CCPP 3*	-	-	-	-	-
15	Utran (Gas)*	-	-	-	-	-



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Sr. No.	Power station	2016-17	2017-18	2018-19	2019-20	2020-21
16	Utran Extension*	-	-	-	-	-
17	Sikka Extn. (3-4)*	0.00%	0.00%	0.00%	0.00%	0.00%
18	Wanakbori 8 TPS*	-	-	0.80%	0.80%	0.80%
19	Dhuvaran STPS*	-	-	-	-	0.80%

* PPA based stations



Performance parameters approved for the control period FY 2016-17 to FY 2020-21 for different stations are given in the Table below:

Table 5.14: Approved parameters of PAF, PLF, Auxiliary Consumption, Heat Rate, Specific Oil Consumption and Coal Transit Loss for FY 2016-17 to FY 2020-21

Stations	PAF					PLF					Auxiliary consumption				
	2016-17	2017-18	2018-19	2019-20	2020-21	2016-17	2017-18	2018-19	2019-20	2020-21	2016-17	2017-18	2018-19	2019-20	2020-21
Ukai (1-5)	80.0%	80.0%	80.0%	80.0%	80.0%	39.0%	60.0%	60.0%	56.0%	58.0%	9.00%	9.00%	9.00%	9.00%	9.00%
Gandhinagar (1-4)	84.0%	84.0%	84.0%	84.0%	84.0%	38.0%	45.0%	45.0%	45.0%	45.0%	9.50%	9.00%	9.00%	9.00%	9.00%
Wanakbori 1-6 TPS	85.0%	85.0%	85.0%	85.0%	85.0%	42.0%	55.0%	52.0%	50.0%	50.0%	9.00%	9.00%	9.00%	9.00%	9.00%
Sikka TPS	80.0%	80.0%	-	-	-	27.0%	40.0%	-	-	-	11.00%	11.00%	-	-	-
KLTPS 1-3	75.0%	75.0%	75.0%	75.0%	75.0%	75.0%	75.0%	75.0%	75.0%	75.0%	12.00%	12.00%	12.00%	12.00%	12.00%
KLTPS 4	80.0%	80.0%	80.0%	80.0%	80.0%	72.0%	75.0%	75.0%	75.0%	75.0%	12.00%	12.00%	12.00%	12.00%	12.00%
Dhuvaran CCPP 2	85.0%	85.0%	85.0%	85.0%	85.0%	21.0%	25.0%	25.0%	25.0%	25.0%	3.00%	3.00%	3.00%	3.00%	3.00%
Ukai Hydro	80.0%	80.0%	80.0%	80.0%	80.0%	13.0%	13.0%	13.0%	13.0%	13.0%	0.60%	0.60%	0.60%	0.60%	0.60%
Kadana Hydro	80.0%	80.0%	80.0%	80.0%	80.0%	6.0%	6.0%	6.0%	6.0%	6.0%	1.00%	1.00%	1.00%	1.00%	1.00%
Ukai Extn. 6*	85.0%	85.0%	85.0%	85.0%	85.0%	73.0%	77.0%	77.0%	77.0%	77.0%	6.00%	6.00%	6.00%	6.00%	6.00%
Gandhinagar 5*	85.0%	85.0%	85.0%	85.0%	85.0%	70.0%	77.0%	77.0%	77.0%	77.0%	9.50%	9.50%	9.50%	9.50%	9.50%
Wanakbori 7 TPS*	85.0%	85.0%	85.0%	85.0%	85.0%	55.0%	70.0%	70.0%	70.0%	70.0%	9.50%	9.50%	9.50%	9.50%	9.50%
Dhuvaran CCPP 1*	85.0%	85.0%	85.0%	85.0%	85.0%	21.0%	25.0%	25.0%	25.0%	25.0%	4.00%	4.00%	4.00%	4.00%	4.00%
Dhuvaran CCPP 3*	85.0%	85.0%	85.0%	85.0%	85.0%	21.0%	25.0%	25.0%	25.0%	25.0%	3.00%	3.00%	3.00%	3.00%	3.00%
Utran (Gas)*	85.0%	-	-	-	-	21.0%	-	-	-	-	2.90%	-	-	-	-
Utran Extension*	85.0%	85.0%	85.0%	85.0%	85.0%	21.0%	25.0%	25.0%	25.0%	25.0%	3.00%	3.00%	3.00%	3.00%	3.00%
Sikka Extn. (3-4)*	85.0%	85.0%	85.0%	85.0%	85.0%	59.0%	70.0%	70.0%	70.0%	70.0%	9.00%	9.00%	9.00%	9.00%	9.00%
Wanakbori 8 TPS*	-	-	85.0%	85.0%	85.0%	-	-	85.0%	85.0%	85.0%	-	-	5.25%	5.25%	5.25%
Dhuvaran STPS*	-	-	-	-	85.0%	-	-	-	-	85.0%	-	-	-	-	5.25%



Gujarat State Electricity Corporation Limited

Truing Up for FY 2015-16, Determination of Final ARR for FY 2016-17, Approval of MYT ARR for FY 2016-17 to FY 2020-21, and Determination of Tariff for FY 2017-18

	Station Heat Rate					SFO Consumption					Transit Loss				
	2016-17	2017-18	2018-19	2019-20	2020-21	2016-17	2017-18	2018-19	2019-20	2020-21	2016-17	2017-18	2018-19	2019-20	2020-21
Ukai (1-5)	2750	2715	2715	2675	2625	1.00	1.00	1.00	1.00	1.00	0.80%	0.80%	0.80%	0.80%	0.80%
Gandhinagar (1-4)	2650	2625	2625	2625	2625	1.25	1.00	1.00	1.00	1.00	0.80%	0.80%	0.80%	0.80%	0.80%
Wanakbori 1-6 TPS	2625	2625	2625	2625	2600	1.00	1.00	1.00	1.00	1.00	0.80%	0.80%	0.80%	0.80%	0.80%
Sikka TPS	3008	3003	-	-	-	3.00	3.00	0.00	0.00	0.00	0.80%	0.80%	-	-	-
KLTPS 1-3	3231	3231	3231	3231	3231	3.00	3.00	3.00	3.00	3.00	0.20%	0.20%	0.20%	0.20%	0.20%
KLTPS 4	3000	3000	3000	3000	3000	3.00	3.00	3.00	3.00	3.00	0.20%	0.20%	0.20%	0.20%	0.20%
Dhuvaran CCPP 2	1950	1950	1950	1950	1950	-	-	-	-	-	-	-	-	-	-
Ukai Hydro	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Kadana Hydro	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ukai Extn. 6*	2385	2385	2385	2385	2385	1.00	1.00	1.00	1.00	1.00	0.80%	0.80%	0.80%	0.80%	0.80%
Gandhinagar 5*	2460	2460	2460	2460	2460	3.50	3.50	3.50	3.50	3.50	0.80%	0.80%	0.80%	0.80%	0.80%
Wanakbori 7 TPS*	2460	2460	2460	2460	2460	3.50	3.50	3.50	3.50	3.50	0.80%	0.80%	0.80%	0.80%	0.80%
Dhuvaran CCPP 1*	1950	1950	1950	1950	1950	-	-	-	-	-	-	-	-	-	-
Dhuvaran CCPP 3*	1850	1850	1850	1850	1850	-	-	-	-	-	-	-	-	-	-
Utran (Gas)*	2150	0	0	0	0	-	-	-	-	-	-	-	-	-	-
Utran Extension*	1850	1850	1850	1850	1850	-	-	-	-	-	-	-	-	-	-
Sikka Extn. (3-4)*	2398	2398	2398	2398	2398	1.00	1.00	1.00	1.00	1.00	0.00%	0.00%	0.00%	0.00%	0.00%
Wanakbori 8 TPS*	-	-	2248	2248	2248	-	-	0.50	0.50	0.50	-	-	0.80%	0.80%	0.80%
Dhuvaran STPS*	-	-	-	-	2248	-	-	-	-	0.50	-	-	-	-	0.80%

* PPA governed stations.



5.3 Gross and Net Generation

GSECL has projected the gross and net generation for different stations, with the projected PLF and auxiliary consumption for the control period FY 2016-17 to FY 2020-21, as given in the Table below:



Table 5.15: Projected Gross and Net generation for the control period FY 2016-17 to FY 2020-21

(MU)

Sr. No.	Power station	2016-17		2017-18		2018-19		2019-20		2020-21	
		Gross	Net	Gross	Net	Gross	Net	Gross	Net	Gross	Net
1	Ukai (1-5)	2903.94	2613.55	4467.60	4020.84	3206.16	2885.54	2992.42	2693.17	3099.29	2789.36
2	Gandhinagar (1-4)	1730.79	1557.71	1655.64	1490.08	1655.64	1490.08	1655.64	1490.08	1655.64	1490.08
3	Wanakbori 1-6 TPS	4635.79	4195.39	6070.68	5493.97	5739.55	5194.29	5518.80	4994.51	5518.80	4994.51
4	Sikka TPS	567.65	496.69	840.96	740.04	0.00	0.00	0.00	0.00	0.00	0.00
5	KLTPS 1-3	1412.55	1228.92	1412.55	1228.92	1412.55	1228.92	1412.55	1228.92	1412.55	1228.92
6	KLTPS 4	473.04	383.16	492.75	413.91	492.75	413.91	492.75	413.91	492.75	413.91
7	Dhuvaran CCPP 2	206.86	194.45	246.27	231.49	246.27	231.49	246.27	231.49	246.27	231.49
8	Ukai Hydro	347.33	344.90	347.33	344.90	347.33	344.90	347.33	344.90	347.33	344.90
9	Kadana Hydro	127.20	125.68	127.20	125.68	127.20	125.68	127.20	125.68	127.20	125.68
10	Ukai Extn. 6*	3197.40	3005.56	3372.60	3170.24	3372.60	3170.24	3372.60	3170.24	3372.60	3170.24
11	Gandhinagar 5*	1287.72	1165.39	1416.49	1281.93	1416.49	1281.93	1416.49	1281.93	1416.49	1281.93
12	Wanakbori 7 TPS*	1011.78	915.66	1287.72	1165.39	1287.72	1165.39	1287.72	1165.39	1287.72	1165.39
13	Dhuvaran CCPP 1*	196.13	184.36	233.49	219.48	233.49	219.48	233.49	219.48	233.49	219.48
14	Dhuvaran CCPP 3*	691.87	671.12	823.66	798.95	823.66	798.95	823.66	798.95	823.66	798.95
15	Utran (Gas)*	198.00	190.08	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
16	Utran Extension*	689.06	668.39	820.31	795.70	820.31	795.70	820.31	795.70	820.31	795.70
17	Sikka Extn. (3-4)*	2584.20	2325.78	3066.00	2774.73	3066.00	2774.73	3066.00	2774.73	3066.00	2774.73
18	Wanakbori 8 TPS*	0.00	0.00	0.00	0.00	5956.80	5644.07	5956.80	5644.07	5956.80	5644.07
19	Dhuvaran STPS*	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	11913.60	11288.14

* PPA based stations



The Gross and Net generation for different stations as approved by the Commission based on the approved PLF and auxiliary consumption as discussed in the earlier paras are given in the Table below:

Table 5.16: Approved Gross and Net Generation for the control period FY 2016-17 to FY 2020-21

(MU)

Sr. No.	Power station	2016-17		2017-18		2018-19		2019-20		2020-21	
		Gross	Net	Gross	Net	Gross	Net	Gross	Net	Gross	Net
1	Ukai (1-5)	2903.94	2642.59	4467.60	4065.52	3206.16	2917.61	3000.61	2730.56	3099.29	2820.35
2	Gandhinagar (1-4)	1730.98	1566.53	1655.64	1506.63	1655.64	1506.63	1660.18	1510.76	1655.64	1506.63
3	Wanakbori 1-6 TPS	4635.79	4218.57	6070.68	5524.32	5739.55	5222.99	5533.92	5035.87	5518.80	5022.11
4	Sikka TPS	567.65	505.21	840.96	748.45	0.00	0.00	0.00	0.00	0.00	0.00
5	KLTPS 1-3	1412.55	1243.04	1412.55	1243.04	1412.55	1243.04	1416.42	1246.45	1412.55	1243.04
6	KLTPS 4	473.04	416.28	492.75	433.62	492.75	433.62	494.10	434.81	492.75	433.62
7	Dhuvaran CCPP 2	206.86	200.66	246.27	238.88	246.27	238.88	246.94	239.53	246.27	238.88
8	Ukai Hydro	347.33	344.90	347.33	344.90	347.33	344.90	348.29	346.20	347.33	344.90
9	Kadana Hydro	127.20	125.68	127.20	125.68	127.20	125.68	127.54	126.27	127.20	125.68
10	Ukai Extn. 6*	3197.40	3005.56	3372.60	3170.24	3372.60	3170.24	3381.84	3178.93	3372.60	3170.24
11	Gandhinagar 5*	1287.72	1165.39	1416.49	1281.93	1416.49	1281.93	1420.37	1285.44	1416.49	1281.93
12	Wanakbori 7 TPS*	1011.78	915.66	1287.72	1165.39	1287.72	1165.39	1291.25	1168.58	1287.72	1165.39
13	Dhuvaran CCPP 1*	196.13	188.29	233.49	224.15	233.49	224.15	234.13	224.77	233.49	224.15
14	Dhuvaran CCPP 3*	691.87	671.12	823.66	798.95	823.66	798.95	825.92	801.14	823.66	798.95
15	Utran (Gas)*	165.00	160.21	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
16	Utran Extension*	689.06	668.39	820.31	795.70	820.31	795.70	822.56	797.88	820.31	795.70
17	Sikka Extn. (3-4)*	2584.20	2351.62	3066.00	2790.06	3066.00	2790.06	3074.40	2797.70	3066.00	2790.06
18	Wanakbori 8 TPS*	0.00	0.00	0.00	0.00	5956.80	5644.07	5973.12	5659.53	5956.80	5644.07
19	Dhuvaran STPS*	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	11913.60	11288.14

* PPA Governed stations.

For Utran (Gas), as the station is decommissioned from 22nd Jan 2017, the weighted avg. capacity of the station is considered for gross generation calculation



6 Generation Costs for the control period FY 2016-17 to FY 2020-21

6.1 Generation Costs - Variable (Energy) and Capacity (Fixed) Charges

6.2 Variable Costs (Energy Charge)

The performance parameters for different stations are discussed and approved for the control period from FY 2016-17 to FY 2020-21 in Chapter 5. The variable costs (mostly fuel cost) depend on the cost parameters such as GCV of different fuels used, mix of fuel and price of fuel. GSECL generating stations run on coal, lignite, and gas as base fuels. For some of the coal stations, a mix of indigenous, washed, and imported coal is used.

In the case of hydro stations, no fuel costs are involved. However, the energy charge and fixed charge for hydro stations shall be recovered in accordance with the GERC (MYT) Regulations, 2016.

It is decided to adopt the cost parameters (except mix of coal) as actually obtained during FY 2015-16 for the control period FY 2016-17 to FY 2020-21 with the provision to pass on any difference in fuel cost to the consumers due to variation in cost parameters during the MYT period as per the FPPPA formula.

GSECL projections and Commission's analysis on the mix of coal, Wt. Av. GCV of fuels to be consumed and Wt. Av. price of fuels for different stations are discussed below:

6.2.1 Mix of Coal

GSECL has projected the percentage mix of coal for different stations for the control period as given in Table below:

Table 6.1: Projected Percentage of Mix of Coal for the control period FY 2016-17 to FY 2020-21

(%)

Sr. No.	Power station	Indigenous coal	Washed coal	Imported coal
1	Ukai (1-5)	22.00%	78.00%	0.00%
2	Gandhinagar (1-4)	0.00%	100.00%	0.00%
3	Wanakbori 1-6 TPS	0.00%	100.00%	0.00%
4	Sikka TPS	0.00%	100.00%	0.00%
5	Ukai Extn. 6*	22.00%	78.00%	0.00%



Sr. No.	Power station	Indigenous coal	Washed coal	Imported coal
6	Gandhinagar 5*	0.00%	100.00%	0.00%
7	Wanakbori 7 TPS*	0.00%	100.00%	0.00%
8	Sikka Extn. (3-4)*	0.00%	0.00%	100.00%
9	Wanakbori 8 TPS	0.00%	100.00%	0.00%
10	Dhuvaran STPS	0.00%	100.00%	0.00%

* PPA based stations

Commission's Analysis

Commission considers to adopt the mix of coal as projected by GSECL for the control period.

Accordingly, the Commission approves the mix of coal as given in Table below:

**Table 6.2: Approved percentage of mix of coal for the control period
FY 2016-17 to FY 2020-21**

(%)

Sr. No.	Power station	Indigenous coal		Washed coal		Imported coal	
		As projected by GSECL	As approved	As projected by GSECL	As approved	As projected by GSECL	As approved
1	Ukai (1-5)	22.00%	22.00%	78.00%	78.00%	0.00%	0.00%
2	Gandhinagar (1-4)	0.00%	0.00%	100.00%	100.00%	0.00%	0.00%
3	Wanakbori 1-6 TPS	0.00%	0.00%	100.00%	100.00%	0.00%	0.00%
4	Sikka TPS	0.00%	0.00%	100.00%	100.00%	0.00%	0.00%
5	Ukai Extn. 6*	22.00%	22.00%	78.00%	78.00%	0.00%	0.00%
6	Gandhinagar 5*	0.00%	0.00%	100.00%	100.00%	0.00%	0.00%
7	Wanakbori 7 TPS*	0.00%	0.00%	100.00%	100.00%	0.00%	0.00%
8	Sikka Extn. (3-4)*	0.00%	0.00%	0.00%	0.00%	100.00%	100.00%
9	Wanakbori 8 TPS	0.00%	0.00%	100.00%	100.00%	0.00%	0.00%
10	Dhuvaran STPS	0.00%	0.00%	100.00%	100.00%	0.00%	0.00%

* PPA based stations

6.2.2 Wt. Av. Gross Calorific Value (GCV) of fuel

GSECL projected the Wt. Av. GCV of different fuels (as fed into the boiler in the case of coal stations), for the control period FY 2016-17 to FY 2020-21, as given in the Table below:

**Table 6.3: Projected Wt. Av. GCV of different fuels for the control period
FY 2016-17 to FY 2020-21**

Sr. No.	Power station	For all the years from 2016-17 to 2020-21		
		Wt. Av. GCV of coal / lignite (k.cal/kg.)	Wt. Av. GCV of Secondary fuel (k.cal/lit.)	Wt. Av. GCV of gas (k.cal/scm)
1	Ukai (1-5)	3835	10441	-
2	Gandhinagar (1-4)	3918	10368	-
3	Wanakbori 1-6 TPS	3880	10327	-
4	Sikka TPS	4272	10378	-
5	KLTPS 1-3	2786	10285	-
6	KLTPS 4	2786	10285	-
7	Dhuvaran CCPP 2		-	9519



Sr. No.	Power station	For all the years from 2016-17 to 2020-21		
		Wt. Av. GCV of coal / lignite (k.cal/kg.)	Wt. Av. GCV of Secondary fuel (k.cal/lit.)	Wt. Av. GCV of gas (k.cal/scm)
8	Ukai Extn. 6*	3821	10422	
9	Gandhinagar 5*	3934	10440	
10	Wanakbori 7 TPS*	3957	10293	
11	Dhuvaran CCPP 1*			9509
12	Dhuvaran CCPP 3*			9826
13	Utran (Gas)*			9802
14	Utran Extension*			9537
15	Sikka Extn. (3-4)*	5270	10310	
16	Wanakbori 8 TPS	4200	10327	
17	Dhuvaran STPS	4200	10327	

* PPA based stations

Commission's Analysis

As GCV of coal is based on actual FSA signed, the Commission decides to arrive at the fuel costs based on the GCVs of coal, secondary fuel oil, and gas projected by GSECL.

Similarly, as projected mix of coal is based on the annual contracted quantities as per the fuel linkage for indigenous coal, washed coal, and targeted quantities of imported coal, the Commission decides to accept the projections of the petitioner.

GSECL also submitted that the projected Wt.Av. GCVs of individual coal (indigenous, washed, and imported coal) are also based on the annual contracted quantities as per the fuel linkages for indigenous coal and washed coal and targeted quantities of imported coal.

The Commission decides to adopt the Wt. Av. GCVs of the mix of coal as fed into the boiler, based on the GCVs of indigenous, washed, and imported coal as projected by GSECL and approved by the Commission in para above.

Accordingly, the Wt. Av. GCV of coal for different coal stations for the control period FY 2016-17 to FY 2020-21 is computed as given in the Table below:



Table 6.4: Computation of Wt. Av. GCV of coal for the control period FY 2016-17 to FY 2020-21

Thermal station	Coal mix (%), as projected by GSECL and accepted by the Commission, to be adopted for the control period			GCV of coal (Kcal/Kg), as actually obtained during 2020-21, to be adopted for the control period			Wt. Av. GCV of the mix to be adopted for the control period 2016-17 to 2020-21
	Indigenous	Washed	Imported	Indigenous	Washed	Imported	
Ukai (1-5)	22.00%	78.00%	0.00%	3785	3849	0	3835
Gandhinagar (1-4)	0.00%	100.00%	0.00%	0	3918	0	3918
Wanakbori 1-6 TPS	0.00%	100.00%	0.00%	0	3880	0	3880
Sikka TPS	0.00%	100.00%	0.00%	0	4272	0	4272
Ukai Extn. 6*	22.00%	78.00%	0.00%	3785	3849	0	3821
Gandhinagar 5*	0.00%	100.00%	0.00%	0	3934	0	3934
Wanakbori 7 TPS*	0.00%	100.00%	0.00%	0	3957	0	3957
Sikka Extn. (3-4)*	0.00%	0.00%	100.00%	0	0	5270	5270
Wanakbori 8 TPS	0.00%	100.00%	0.00%	0	4200	0	4200
Dhuvaran STPS	0.00%	100.00%	0.00%	0	4200	0	4200

* PPA based stations

The Wt. Av. GCV of different fuels for different stations approved for the control period FY 2016-17 to FY 2020-21 is as given in the Table below:

Table 6.5: Wt. Av. GCV of different fuels approved for the control period FY 2016-17 to FY 2020-21

Sr. No.	Power station	For all the years from 2016-17 to 2020-21		
		Wt. Av. GCV of coal / lignite (k.cal/kg.)	Wt. Av. GCV of Secondary fuel (k.cal/lit.)	Wt. Av. GCV of gas (k.cal/scm)
1	Ukai (1-5)	3835	10441	-
2	Gandhinagar (1-4)	3918	10368	-
3	Wanakbori 1-6 TPS	3880	10327	-
4	Sikka TPS	4272	10378	-
5	KLTPS 1-3	2786	10285	-
6	KLTPS 4	2786	10285	-
7	Dhuvaran CCPP 2		-	9519
8	Ukai Extn. 6*	3821	10422	
9	Gandhinagar 5*	3934	10440	
10	Wanakbori 7 TPS*	3957	10293	
11	Dhuvaran CCPP 1*			9509
12	Dhuvaran CCPP 3*			9826
13	Utran (Gas)*			9802
14	Utran Extension*			9537
15	Sikka Extn. (3-4)*	5270	10310	
16	Wanakbori 8 TPS	4200	10327	
17	Dhuvaran STPS	4200	10327	

* PPA based stations

Any difference in the fuel costs due to the variation in the above values is to be passed on to the consumers based on the approved FPPPA formula.



6.2.3 Wt. Av. Prices of Fuel

GSECL projected the Wt. Av. prices of coal for different stations for the control period as given in Table below:

Table 6.6: Projected Wt. Av. prices of coal for the control period FY 2016-17 to 2020-21

(Rs./MT)

Stations	2016-17			2017-18			2018-19			2019-20			2020-21		
	Indigenous	Washed	Imported	Indigenous	Washed	Imported	Indigenous	Washed	Imported	Indigenous	Washed	Imported	Indigenous	Washed	Imported
Ukai (1-5)	3725	4415	0	3837	4548	0	3952	4684	0	4071	4825	0	4193	4969	0
Gandhinagar (1-4)	0	4891	5650	0	5038	0	0	5189	0	0	5345	0	0	5505	0
Wanakbori 1-6 TPS	0	4861	0	0	5007	0	0	5157	0	0	5312	0	0	5472	0
Sikka TPS	0	5134	0	0	5288	0	0	5447	0	0	5610	0	0	5779	0
KLTPS 1-3	2045	0	0	2106	0	0	2170	0	0	2235	0	0	2302	0	0
KLTPS 4	2045	0	0	2106	0	0	2170	0	0	2235	0	0	2302	0	0
Ukai Extn. 6*	3725	4415	0	3837	4548	0	3952	4684	0	4071	4825	0	4193	4969	0
Gandhinagar 5*	0	4891	5650	0	5038	0	0	5189	0	0	5345	0	0	5505	0
Wanakbori 7 TPS*	0	4861	0	0	5007	0	0	5157	0	0	5312	0	0	5472	0
Sikka Extn. (3-4)*	0	0	5650	0	0	5820	0	0	5994	0	0	6174	0	0	6359
Wanakbori 8 TPS	0	0	0	0	0	0	0	5157	0	0	5157	0	0	5157	0
Dhuvaran STPS	0	0	0	0	0	0	0	0	0	0	0	0	0	5157	0

* PPA based stations



GSECL projected the Wt. Av. cost of secondary fuel oil for different stations for the control period as given in the Table below:

Table 6.7: Projected Wt. Av. price of secondary fuel oil for the control period FY 2016-17 to 2020-21

						(Rs./KI)
Sr. No.	Power Station	2016-17	2017-18	2018-19	2019-20	2020-21
1	Ukai (1-5)	19166	20124	21131	22187	23296
2	Gandhinagar (1-4)	18667	19600	20580	21609	22690
3	Wanakbori 1-6 TPS	19468	20442	21464	22537	23664
4	Sikka TPS	24531	25757	-	-	-
5	KLTPS 1-3	24396	25616	26897	28242	29654
6	KLTPS 4	24396	25616	26897	28242	29654
7	Ukai Extn. 6*	18243	19155	20113	21119	22175
8	Gandhinagar 5*	18667	19600	20580	21609	22690
9	Wanakbori 7 TPS*	19468	20442	21464	22537	23664
10	Sikka Extn. (3-4)*	22554	23682	24866	26110	27415
11	Wanakbori 8 TPS	0	0	21464	21464	21464
12	Dhuvaran STPS	0	0	0	0	21464

* PPA based stations



GSECL projected Wt. Av. prices of gas for different gas stations for the control period, as given in the Table below:

Table 6.8: Projected Wt . Av. price of gas for the control period FY 2016-17 to FY 2020-21

(Rs./SCM)						
Sr. No.	Power station	2016-17	2017-18	2018-19	2019-20	2020-21
1	Dhuvaran Gas 1	10.93	11.48	12.06	12.66	13.29
2	Dhuvaran Gas 2	11.16	11.72	12.31	12.92	13.57
3	Dhuvaran Gas 3	21.75	22.84	23.98	25.18	26.43
4	Utran Gas	21.10	0	0	0	0
5	Utran Extension	21.22	22.28	23.39	24.56	25.79

Commission's Analysis

It is decided to take into consideration the actual prices of different fuels as obtained during FY 2015-16, except for indigenous and washed coal prices. For indigenous and washed coal prices, the Commission has excluded the amount of penalty paid due to lower off take of coal during FY 2015-16 to arrive at coal prices to be considered for the control period. For the imported coal and secondary fuel oil, the prices as per actual paid during FY 2015-16 are considered for the control period which are reproduced in the Table below:

Table 6.9: Approved Wt. Av. Price per unit of different fuels for control period FY 2016-17 to FY 2020-21

Sr. No.	Power stations	Wt Av cost of indigenous coal (Rs./Mt)	Wt Av cost of washed coal (Rs./Mt)	Wt Av cost of imported coal (Rs./Mt)	Wt Av cost of lignite coal (Rs./Mt)	Wt Av cost of gas (Rs./SCM)	Wt Av cost of oil (Rs./KI)
1	Ukai (1-5)	3,396	3,679	6,227	-	-	33170
2	Gandhinagar (1-4)	4,932	4,428	6,817	-	-	31793
3	Wanakbori 1-6 TPS	5,368	4,334	6,750	-	-	31022
4	Sikka TPS	0	4,763	3,409	-	-	34658
5	KLTPS 1-3	-	-	-	1072	-	28419
6	KLTPS 4	-	-	-	1088	-	44459
7	Dhuvaran CCPP 2	-	-	-	-	19.26	-
8	Ukai Hydro	0	0	0	-	-	-
9	Kadana Hydro	0	0	0	-	-	-
10	Ukai Extn. 6*	3,516	3,799	6,222	-	-	32950
11	Gandhinagar 5*	4,824	4,360	7,187	-	-	32221
12	Wanakbori 7 TPS*	5,422	4,355	6,819	-	-	31536
13	Dhuvaran CCPP 1*	-	-	-	-	18.25	-
14	Dhuvaran CCPP 3*	-	-	-	-	11.62	-



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Sr. No.	Power stations	Wt Av cost of indigenous coal (Rs./Mt)	Wt Av cost of washed coal (Rs./Mt)	Wt Av cost of imported coal (Rs./Mt)	Wt Av cost of lignite coal (Rs./Mt)	Wt Av cost of gas (Rs./SCM)	Wt Av cost of oil (Rs./KI)
15	Utran (Gas)*	-	-	-	-	21.10	-
16	Utran Extension*	-	-	-	-	21.73	-
17	Sikka Extn. (3-4)*	0	0	4,819	-	-	23936
18	Wanakbori 8 TPS	0	5157	0	-	-	21464
19	Dhuvaran STPS	0	5157	0	-	-	21464

* PPA based stations

The Commission decides to arrive at the fuel cost for the control period based on the cost parameters approved, as given in the Tables 6.2, 6.5 and 6.9. Any difference in the fuel cost due to variation in cost parameters is to be passed on to the consumers as per the approved FPPPA formula.



6.2.4 Performance Parameters

The performance parameters, approved in Chapter 5 for the control period as per GERC (MYT) Regulations, 2016, are to be adopted for arriving at the fuel cost. The performance parameters approved in Chapter 5 are reproduced in Table below:

Table 6.10: Approved performance parameters for control period FY 2016-17 to FY 2020-21 (%)

STATIONS	PAF(%)					PLF(%)					AUXILIARY CONSUMPTION(%)				
	2016-17	2017-18	2018-19	2019-20	2020-21	2016-17	2017-18	2018-19	2019-20	2020-21	2016-17	2017-18	2018-19	2019-20	2020-21
Ukai (1-5)	80.0%	80.0%	80.0%	80.0%	80.0%	39.0%	60.0%	60.0%	56.0%	58.0%	9.00%	9.00%	9.00%	9.00%	9.00%
Gandhinagar (1-4)	84.0%	84.0%	84.0%	84.0%	84.0%	38.0%	45.0%	45.0%	45.0%	45.0%	9.50%	9.00%	9.00%	9.00%	9.00%
Wanakbori 1-6 TPS	85.0%	85.0%	85.0%	85.0%	85.0%	42.0%	55.0%	52.0%	50.0%	50.0%	9.00%	9.00%	9.00%	9.00%	9.00%
Sikka TPS	80.0%	80.0%	-	-	-	27.0%	40.0%	-	-	-	11.00%	11.00%	-	-	-
KLTPS 1-3	75.0%	75.0%	75.0%	75.0%	75.0%	75.0%	75.0%	75.0%	75.0%	75.0%	12.00%	12.00%	12.00%	12.00%	12.00%
KLTPS 4	80.0%	80.0%	80.0%	80.0%	80.0%	72.0%	75.0%	75.0%	75.0%	75.0%	12.00%	12.00%	12.00%	12.00%	12.00%
Dhuvaran CCPP 2	85.0%	85.0%	85.0%	85.0%	85.0%	21.0%	25.0%	25.0%	25.0%	25.0%	3.00%	3.00%	3.00%	3.00%	3.00%
Ukai Hydro	80.0%	80.0%	80.0%	80.0%	80.0%	13.0%	13.0%	13.0%	13.0%	13.0%	0.60%	0.60%	0.60%	0.60%	0.60%
Kadana Hydro	80.0%	80.0%	80.0%	80.0%	80.0%	6.0%	6.0%	6.0%	6.0%	6.0%	1.00%	1.00%	1.00%	1.00%	1.00%
Ukai Extn. 6*	85.0%	85.0%	85.0%	85.0%	85.0%	73.0%	77.0%	77.0%	77.0%	77.0%	6.00%	6.00%	6.00%	6.00%	6.00%
Gandhinagar 5*	85.0%	85.0%	85.0%	85.0%	85.0%	70.0%	77.0%	77.0%	77.0%	77.0%	9.50%	9.50%	9.50%	9.50%	9.50%
Wanakbori 7 TPS*	85.0%	85.0%	85.0%	85.0%	85.0%	55.0%	70.0%	70.0%	70.0%	70.0%	9.50%	9.50%	9.50%	9.50%	9.50%
Dhuvaran CCPP 1*	85.0%	85.0%	85.0%	85.0%	85.0%	21.0%	25.0%	25.0%	25.0%	25.0%	4.00%	4.00%	4.00%	4.00%	4.00%
Dhuvaran CCPP 3*	85.0%	85.0%	85.0%	85.0%	85.0%	21.0%	25.0%	25.0%	25.0%	25.0%	3.00%	3.00%	3.00%	3.00%	3.00%
Utran (Gas)*	85.0%	0.0%	0.0%	0.0%	0.0%	21.0%	-	-	-	-	2.90%	-	-	-	-
Utran Extension*	85.0%	85.0%	85.0%	85.0%	85.0%	21.0%	25.0%	25.0%	25.0%	25.0%	3.00%	3.00%	3.00%	3.00%	3.00%
Sikka Extn. (3-4)*	85.0%	85.0%	85.0%	85.0%	85.0%	59.0%	70.0%	70.0%	70.0%	70.0%	9.00%	9.00%	9.00%	9.00%	9.00%
Wanakbori 8 TPS*	-	-	85.0%	85.0%	85.0%	-	-	85.0%	85.0%	85.0%	-	-	5.25%	5.25%	5.25%
Dhuvaran STPS*	-	-	-	-	85.0%	-	-	-	-	85.0%	-	-	-	-	5.25%



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STATIONS	Station Heat Rate (kcal/kWh)					SFO Consumption(ml/kWh)					Transit Loss(%)				
	2016-17	2017-18	2018-19	2019-20	2020-21	2016-17	2017-18	2018-19	2019-20	2020-21	2016-17	2017-18	2018-19	2019-20	2020-21
Ukai (1-5)	2750	2715	2715	2675	2625	1.00	1.00	1.00	1.00	1.00	0.80%	0.80%	0.80%	0.80%	0.80%
Gandhinagar (1-4)	2650	2625	2625	2625	2625	1.25	1.00	1.00	1.00	1.00	0.80%	0.80%	0.80%	0.80%	0.80%
Wanakbori 1-6 TPS	2625	2625	2625	2625	2600	1.00	1.00	1.00	1.00	1.00	0.80%	0.80%	0.80%	0.80%	0.80%
Sikka TPS	3008	3003	-	-	-	3.00	3.00	0.00	0.00	0.00	0.80%	0.80%	-	-	-
KLTPS 1-3	3231	3231	3231	3231	3231	3.00	3.00	3.00	3.00	3.00	0.20%	0.20%	0.20%	0.20%	0.20%
KLTPS 4	3000	3000	3000	3000	3000	3.00	3.00	3.00	3.00	3.00	0.20%	0.20%	0.20%	0.20%	0.20%
Dhuvaran CCPP 2	1950	1950	1950	1950	1950	-	-	-	-	-	-	-	-	-	-
Ukai Hydro	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Kadana Hydro	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ukai Extn. 6*	2385	2385	2385	2385	2385	1.00	1.00	1.00	1.00	1.00	0.80%	0.80%	0.80%	0.80%	0.80%
Gandhinagar 5*	2460	2460	2460	2460	2460	3.50	3.50	3.50	3.50	3.50	0.80%	0.80%	0.80%	0.80%	0.80%
Wanakbori 7 TPS*	2460	2460	2460	2460	2460	3.50	3.50	3.50	3.50	3.50	0.80%	0.80%	0.80%	0.80%	0.80%
Dhuvaran CCPP 1*	1950	1950	1950	1950	1950	-	-	-	-	-	-	-	-	-	-
Dhuvaran CCPP 3*	1850	1850	1850	1850	1850	-	-	-	-	-	-	-	-	-	-
Utran (Gas)*	2150	0	0	0	0	-	-	-	-	-	-	-	-	-	-
Utran Extension*	1850	1850	1850	1850	1850	-	-	-	-	-	-	-	-	-	-
Sikka Extn. (3-4)*	2398	2398	2398	2398	2398	1.00	1.00	1.00	1.00	1.00	0.00%	0.00%	0.00%	0.00%	0.00%
Wanakbori 8 TPS*	-	-	2248	2248	2248	-	-	0.50	0.50	0.50	-	-	0.80%	0.80%	0.80%
Dhuvaran STPS*	-	-	-	-	2248	-	-	-	-	0.50	-	-	-	-	0.80%

* PPA governed stations.

The fuel cost for the control period FY 2016-17 to FY 2020-21 is arrived at based on the performance and cost parameters approved as indicated above.



6.2.5 Fuel Costs

The station-wise approved fuel costs for the control period, based on the decisions of the Commission in the earlier paras are given in Table below:

Table 6.11: Approved Fuel Costs for the control period FY 2016-17 to 2020-21 along with projected costs

(Rs. Crore)

Sr. No.	Power station	2016-17		2017-18		2018-19		2019-20		2020-21	
		Proj.	App.	Proj.	App.	Proj.	App.	Proj.	App.	Proj.	App.
1	Ukai (1-5)	899	766	1406	1164	1039	835	985	770	1031	781
2	Gandhinagar (1-4)	585	533	576	498	594	498	612	500	630	498
3	Wanakbori 1-6 TPS	1571	1379	2119	1806	2045	1707	2025	1646	2047	1626
4	Sikka TPS	212	196	320	290	0	0	0	0	0	0
5	KLTPS 1-3	346	186	355	186	366	186	377	187	388	186
6	KLTPS 4	110	61	116	64	120	64	124	64	127	64
7	Dhuvaran CCPP 2	49	82	61	97	64	97	67	97	70	97
8	Ukai Hydro	0	0	0	0	0	0	0	0	0	0
9	Kadana Hydro	0	0	0	0	0	0	0	0	0	0
10	Ukai Extn. 6*	899	756	976	798	1005	798	1036	800	1067	798
11	Gandhinagar 5*	410	529	465	502	479	502	494	503	509	502
12	Wanakbori 7 TPS*	318	283	414	360	427	360	440	361	453	360
13	Dhuvaran CCPP 1*	47	73	58	87	61	87	64	88	68	87
14	Dhuvaran CCPP 3*	283	151	354	180	372	180	390	181	410	180
15	Utran (Gas)*	91	76	0	0	0	0	0	0	0	0
16	Utran Extension*	284	290	355	346	372	346	391	347	410	346
17	Sikka Extn. (3-4)*	743	570	888	677	897	677	925	679	953	677
18	Wanakbori 8 TPS*	0	0	0	0	1660	1660	1660	1665	1660	1660
19	Dhuvaran STPS*	0	0	0	0	0	0	0	0	3320	3320
	Total	6848	5933	8462	7054	9500	7998	9588	7886	13143	11182

* PPA based stations



6.2.6 Fuel costs per unit (kWh)

The fuel costs of different stations per unit gross and net generation as approved by the Commission are given in Table below:

Table 6.12: Approved Fuel costs per unit for the control period FY 2016-17 to 2020-21

(Rs./kWh)

Sr. No.	Name of the Station	2016-17		2017-18		2018-19		2019-20		2020-21	
		Fuel Cost per unit Gross	Fuel cost per unit Net	Fuel Cost per unit Gross	Fuel cost per unit Net	Fuel Cost per unit Gross	Fuel cost per unit Net	Fuel Cost per unit Gross	Fuel cost per unit Net	Fuel Cost per unit Gross	Fuel cost per unit Net
1	Ukai (1-5)	2.638	2.899	2.605	2.862	2.605	2.862	2.567	2.821	2.519	2.768
2	Gandhinagar (1-4)	3.078	3.401	3.010	3.308	3.010	3.308	3.010	3.308	3.010	3.308
3	Wanakbori 1-6 TPS	2.975	3.269	2.975	3.269	2.975	3.269	2.975	3.269	2.947	3.238
4	Sikka TPS	3.450	3.876	3.444	3.870	0.000	0.000	0.000	0.000	0.000	0.000
5	KLTPS 1-3	1.317	1.496	1.317	1.496	1.317	1.496	1.317	1.496	1.317	1.496
6	KLTPS 4	1.293	1.469	1.293	1.469	1.293	1.469	1.293	1.469	1.293	1.469
7	Dhuvaran CCPP 2	3.944	4.066	3.944	4.066	3.944	4.066	3.944	4.066	3.944	4.066
8	Ukai Hydro	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
9	Kadana Hydro	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
10	Ukai Extn. 6*	2.365	2.516	2.365	2.516	2.365	2.516	2.365	2.516	2.365	2.516
11	Gandhinagar 5*	4.109	4.540	3.541	3.912	3.541	3.912	3.541	3.912	3.541	3.912
12	Wanakbori 7 TPS*	2.799	3.093	2.799	3.093	2.799	3.093	2.799	3.093	2.799	3.093
13	Dhuvaran CCPP 1*	3.743	3.899	3.743	3.899	3.743	3.899	3.743	3.899	3.743	3.899
14	Dhuvaran CCPP 3*	2.188	2.256	2.188	2.256	2.188	2.256	2.188	2.256	2.188	2.256
15	Utran (Gas)*	4.628	4.766	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
16	Utran Extension*	4.215	4.345	4.215	4.345	4.215	4.345	4.215	4.345	4.215	4.345
17	Sikka Extn. (3-4)*	2.207	2.425	2.207	2.425	2.207	2.425	2.207	2.425	2.207	2.425
18	Wanakbori 8 TPS*	0.000	0.000	0.000	0.000	2.787	2.941	2.787	2.941	2.787	2.941
19	Dhuvaran STPS*	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	2.787	2.941

* PPA based stations

6.2.7 Fuel Cost per G. Calories

The fuel cost approved per Giga calories (G.cal) for each station for the control period based on FY 2015-16 fuel prices for FY 2016-17 to FY 2020-21 is given in Table below:

Table 6.13: Approved fuel cost per G.Cal for control period for FY 2016-17 to 2020-21

(Rs./G.Cal)

Sr. No.	Power station	2016-17	2017-18	2018-19	2019-20	2020-21
1	Ukai (1-5)	959.32	959.43	959.43	959.55	959.72
2	Gandhinagar (1-4)	1161.58	1146.78	1146.78	1146.78	1146.78
3	Wanakbori 1-6 TPS	1133.32	1133.32	1133.32	1133.32	1133.39
4	Sikka TPS	1146.80	1146.84	0.00	0.00	0.00



Sr. No.	Power station	2016-17	2017-18	2018-19	2019-20	2020-21
5	KLTPS 1-3	407.54	407.54	407.54	407.54	407.54
6	KLTPS 4	430.88	430.88	430.88	430.88	430.88
7	Dhuvaran CCPP 2	2022.80	2022.80	2022.80	2022.80	2022.80
8	Ukai Hydro	0.00	0.00	0.00	0.00	0.00
9	Kadana Hydro	0.00	0.00	0.00	0.00	0.00
10	Ukai Extn. 6*	991.63	991.63	991.63	991.63	991.63
11	Gandhinagar 5*	1670.18	1439.33	1439.33	1439.33	1439.33
12	Wanakbori 7 TPS*	1137.99	1137.99	1137.99	1137.99	1137.99
13	Dhuvaran CCPP 1*	1919.73	1919.73	1919.73	1919.73	1919.73
14	Dhuvaran CCPP 3*	1182.63	1182.63	1182.63	1182.63	1182.63
15	Utran (Gas)*	2152.62	0.00	0.00	0.00	0.00
16	Utran Extension*	2278.29	2278.29	2278.29	2278.29	2278.29
17	Sikka Extn. (3-4)*	920.39	920.39	920.39	920.39	920.39
18	Wanakbori 8 TPS*	0.00	0.00	1239.69	1239.69	1239.69
19	Dhuvaran STPS*	0.00	0.00	0.00	0.00	1239.69

* PPA based stations

The detailed calculations for each station for arriving at the above costs are given in Annexures 6.1 to 6.17.

6.3 Capital Expenditure

6.3.1 Capital Expenditure for New Projects

Petitioner's Submission

GSECL has projected the capital expenditure to the extent of Rs. 1789.48 Crore for the control period FY 2016-17 to 2020-21. The projected Capex is towards major R&M, minor R&M, need based R&M, and other capital works. The CAPEX is expected to be capitalized in the same year as submitted by GSECL.

The actual Capex projections for the control period from FY 2016-17 to FY 2020-21 submitted by GSECL in the petition are given plant-wise and year-wise in the Table below:



**Table 6.14: Capital Expenditure Projected by GSECL for the control period
FY2016- 17 to 2020-21**

(Rs. Crore)

Sr. No.	Station	2016-17	2017-18	2018-19	2019-20	2020-21
1	Ukai (1-5)	236.96	64.52	233.17	202.52	53.72
2	Ukai Extn. 6	-	-	-	-	-
3	Gandhinagar (1-4)	8.79	3.40	3.35	3.29	1.29
4	Gandhinagar 5	-	-	-	-	-
5	Wanakbori 1-6 TPS	150.11	100.04	317.67	112.25	71.94
6	Wanakbori 7 TPS	-	-	-	-	-
7	Sikka TPS	24.30	-	-	-	-
8	Sikka Extn. (3-4)	-	-	-	-	-
9	KLTPS 1-3	6.67	7.50	6.25	6.50	5.00
10	KLTPS 4	8.00	4.76	1.00	3.00	3.00
11	Dhuvaran CCPP 1	-	-	-	-	-
12	Dhuvaran CCPP 2	4.37	29.00	25.00	25.00	50.00
13	Dhuvaran CCPP 3	-	-	-	-	-
14	Utran (Gas)	-	-	-	-	-
15	Utran Extension	5.00	2.50	-	-	-
16	Ukai Hydro	0.90	-	-	-	-
17	Kadana Hydro	1.16	2.55	1.50	2.00	1.50
	Total	446.26	214.27	587.94	354.56	186.45
	Funding					
	Debt	312.38	149.99	411.57	248.19	130.51
	Equity	133.88	64.29	176.39	106.38	55.94

* PPA based stations

GSECL submitted that the plant-wise proposed Capex funding is in the ratio of 70:30 Debt to Equity. Most of the R&M will mainly be used for:

(a) ESP Retrofitting of 200/210 MW old units of Wanakbori TPS and Ukai TPS.

To bring down the ESP emission within limits prescribed by GPCB, Company has carried out Conditional Assessment (CA) of all the ESPs of GSECL through BHEL and further detailed study thereof. Company has also carried out the detailed study for replacement, modification, R&M etc. of ESPs to bring down the emission level within the permissible limit set by GPCB. The old units were designed as per GPCB norms prevailing at the time of commissioning. Hence, in order to meet the present GPCB norms / futuristic norms it is necessary to carryout retrofitting of ESP for old 200/210 MW units of GSECL.

Benefits:

As GSECL's units are old and facilitated with ESP with the consideration of high SPM level norms of that respective time & it is not sufficient to fulfil the requirement of present pollution control norms, which are likely to become more stringent in near future.



To achieve the limit of pollution control prevailing & futuristic norms additional collecting surface area (ESP Fields) is necessary to carryout retrofitting.

Looking to meet the requirement of pollution norms and for Green power GSECL has taken ESP retrofitting work under R&M activity to reduce SPM level at 50mg/NM3

- Efficiency Improvement of Boiler and replacement of Air Pre heater for Ukai TPS & Wanakbori TPS
- Replacement of existing APH by new improved design APH.
- Replacement of existing Economizer by new improved design Economizer,
- Rectification in second pass of boiler is suitable with the new economizer and APH.

Benefits:

- Efficiency of boiler shall be increased by 1.5 to 2% i.e Unit cycle HR shall be improved by 30 kcal/kWh and variable cost shall be reduced. Coal saving done and carbon emission reduced.
- Due to latest design of economizer coils with higher diameter and thickness, BTL of economizer shall be minimized.
- Existing APH are very old and deteriorated. The boilers are operating at 2 to 3% lower than designed efficiency so by replacing existing APH by modified APH with improved design not only restores the efficiency but increases the boiler efficiency.
- Reduction in flue gas temperature improves the ESP performance and reduces stack emission.
- Payback will be 2 to 2 ½ years.

(b) Renovation & Modernization of steam Turbine of Ukai 3,4,5 and Wanakbori 1,2,3 units

At present, there are 6 Nos. 210 MW units with LMZ turbine. As such, majority of these units are more than 30 years old and have completed their service life. Though the maintenance of the turbines of these units is carried out regularly during AOH and COH, their heat rates are higher than the design value. Hence, Company has decided



for the retrofitting of LMZ Turbine in order to improve the efficiency of existing LMZ turbines of the thermal power plants of the company.

Benefits:

- Ukai & Wanakbori LMZ Turbines have already operated for more than 25 years. Its design is now nearly 50 years old.
- Present Turbine Heat Rate: 2269 Kcal/kWh
- Expected Turbine Heat Rate after Retrofitting: Less than 2000 Kcal/kWh.
- Extended Life of 10 is considered after Retrofitting.
- Reduction in coal consumption after Retrofit is 18 TPH
- Cost of coal saved 45 Crore Rupees per year after Retrofit per unit.
- Payback period for capital investment varies from 2.2 yrs. to 3.2 yrs.
- Ukai & Wanakbori LMZ Turbines have already operated for more than 25 years. Its design is now nearly 50 years old.
- Present Turbine Heat Rate: 2269 Kcal/kWh
- Expected Turbine Heat Rate after Retrofitting: Less than 2000 Kcal/kWh.
- Extended Life of 10 years is considered after Retrofitting.
- Reduction in coal consumption after Retrofit is 18 TPH
- Cost of coal saved 45 Crore Rupees per year after Retrofit per unit.
- Payback period for capital investment varies from 2.2 yrs. to 3.2 yrs

(c) Efficiency Improvement of Boiler and replacement of Air Pre heater and FGD

- Replacement of existing APH by new improved design APH.
- Replacement of existing Economizer by new improved design Economizer,
- Rectification in second pass of boiler suitable with the new economizer and APH.
- FGD installation



Benefits:

- Efficiency of boiler shall be increased by 1.5 to 2% i.e Unit cycle HR shall be improved by 30 kcal/kWh and variable cost shall be reduced. Coal saving done and carbon emission reduced.
- Due to latest design of economizer coils with higher diameter and thickness, BTL of economizer shall be minimized.
- Existing APH are of very old and deteriorated. The boilers are operating at 2 to 3% lower than designed efficiency so by replacing existing APH by modified APH with improved design not only restores the efficiency but increased the boiler efficiency.
- Reduction in flue gas temperature improves the ESP performance and reduces stack emission.
- Payback will be 2 to 2 ½ years.
- To meet revised environmental norms for SOx and NOx

6.3.2 Capital Expenditure for New Projects

GSECL has submitted that in addition to the major and minor R&M capital expenditure mentioned above, Capex is also envisaged for new generation projects namely Wanakbori-8 & Dhuvaran STPS.

The proposed Capex and present status for the new projects is given in the Table below:

Table 6.15: Capital Expenditure for New Projects

Sr. No.	Name of project	Capacity in MW	Scheduled CoD	Present Status
1	Wanakbori 8	800	2018-19	<p>Project Cost: Rs. 4465 Cr.</p> <p>GSECL invited the bid for EPC contract through ICB route. BHEL was L1 & was awarded the EPC contract for establishment of supercritical technology at Wanakbori. Zero date is considered as 21st Oct'14 and the time limit for completion of the project is 48 months.</p> <p>Project cost is Rs. 4465 Cr & financial closure with Commercial Banks i.e. SBI, Bank of Baroda & Corporate Bank has been done.</p>



Sr. No.	Name of project	Capacity in MW	Scheduled CoD	Present Status
2	Dhuvaran STPS	1600	2020-21	Project Cost: Rs. 10,330 Cr. GSECL intends for establishment supercritical unit at Dhuvaran District, Anand. Draft feasibility report is received & preparation of DPR, CRZ mapping, EIA consultancy is under progress. On receiving of ToR & MoEF clearance, GSECL will further proceed for implementation of Dhuvaran STPS.

6.3.3 Decommissioning Schedule of Plants

GSECL is planning to decommission few units due to completion of the useful life. The decommissioning schedule of plants is mentioned below:

Table 6.16: De-Commissioning Schedule of Plants

Name of Station	Unit No.	Capacity of the Unit (MW)	Date of Commissioning	Age on	Decommissioning Schedule
				01/04/2016 (Years)	
Ukai	1	120	19/3/1976	40	31 st Mar'18
	2	120	23/6/1976	40	
Gandhinagar	1	120	13/3/1977	39	03 rd Sep'16
	2	120	10/4/1977	39	
Sikka	1	120	26/3/1988	28	31 st Mar'18
	2	120	31/3/1993	23	
Utran	GT - 1	30	17/12/1992	23	22 nd Jan'17
	GT - 2	30	28/12/1992	23	
	GT - 3	30	7/5/1993	23	
	STG	45	17/7/1993	23	

GSECL further submitted that fixed cost for Ukai 1-5, GTPS 1-4 & Utran gas has been proportionately reduced in line with the decommissioning schedule of the units. Also, in the event of decommissioning of Ukai 1-2 and Sikka 1-2 before above shown date, the fixed cost would be recovered only till actual date of decommissioning and balance depreciation would be additionally charged subsequently.

Commission's Analysis

The Commission has noted the capital expenditure and capitalization projections as submitted by GSECL. The Commission is of the view that the capital expenditure outlay for existing projects is for R&M purpose. Moreover, GSECL has projected



lower SHR for respective stations where R&M is expected. The Commission has also noted the capital expenditure envisaged for new projects during the control period. The Commission approves the capital expenditure and capitalisation for existing projects as submitted by the Petitioner. For the new projects, the Commission provisionally approves the capital expenditure and capitalization as submitted by the Petitioner subject to final approval of the capital cost of these projects on completion.

The Commission noted the decommissioning schedule of the petitioner and observed that the petitioner has reduced the fixed cost of these stations on account of retirement from the respective year of decommissioning.

The Commission accordingly approves the Capex and Capitalization along with its funding through a mix of debt and equity as shown in the Table below:

Table 6.17: Approved Capital Expenditure, Capitalization and funding for the control period FY 2016- 17 to 2020-21

(Rs. Crore)						
Sr. No.	Station	2016-17	2017-18	2018-19	2019-20	2020-21
1	Ukai (1-5)	236.96	64.52	233.17	202.52	53.72
2	Ukai Extn. 6	-	-	-	-	-
3	Gandhinagar (1-4)	8.79	3.40	3.35	3.29	1.29
4	Gandhinagar 5	-	-	-	-	-
5	Wanakbori 1-6 TPS	150.11	100.04	317.67	112.25	71.94
6	Wanakbori 7 TPS	-	-	-	-	-
7	Sikka TPS	24.30	-	-	-	-
8	Sikka Extn. (3-4)	-	-	-	-	-
9	KLTPS 1-3	6.67	7.50	6.25	6.50	5.00
10	KLTPS 4	8.00	4.76	1.00	3.00	3.00
11	Dhuvaran CCPP 1	-	-	-	-	-
12	Dhuvaran CCPP 2	4.37	29.00	25.00	25.00	50.00
13	Dhuvaran CCPP 3	-	-	-	-	-
14	Utran (Gas)	-	-	-	-	-
15	Utran Extension	5.00	2.50	-	-	-
16	Ukai Hydro	0.90	-	-	-	-
17	Kadana Hydro	1.16	2.55	1.50	2.00	1.50
	Total	446.26	214.27	587.94	354.56	186.45
	Funding					
	Debt (70%)	312.38	149.99	411.57	248.19	130.51
	Equity (30%)	133.88	64.29	176.39	106.38	55.94

* PPA based stations



6.4 Projected fixed costs for the control period (FY 2016-17 to 2020- 21)

Petitioner's Submission

The petitioner has submitted the projections of fixed charges comprising the following components for FY 2016-17 to FY 2020-21.

- Depreciation
- Interest and Finance charges
- Return on equity
- O&M expenses
- Water charges
- Insurance charges
- Interest on Working Capital
- Tax on Income
- SLDC charges
- Non-Tariff Income

The components of fixed charges mentioned above are discussed in detail in the following paras:

6.4.1 Depreciation

Petitioner's Submission

GSECL has considered Depreciation rates based on actual rate of depreciation in FY 2015-16 and GERC (MYT) Regulations, 2016. For Generating Stations under the transfer scheme, the depreciation has been calculated as per the GERC (MYT) Regulations, 2016.

GSECL submitted that considering the transfer date of stations as 1st April, 2005, twelve years would be completed on 31st March, 2017. Therefore, as per GERC (MYT) Regulations, 2016, GSECL would be entitled to charge balance depreciation in FY 2017-18 since most of the transfer stations have completed their useful life viz. 25 years (thermal) and 35 years (hydro) from the date of commissioning of last unit of respective station in line with PPA.

To avoid such huge burden on consumers, GSECL has spread the depreciation over an extended useful life as per GSECL's policy. As per the policy of GSECL the useful life has been extended to 35 years for thermal and hydro. Accordingly, balance



depreciation as on 01.04.2017 has been spread over remaining useful life for each transferred station.

Therefore, in line with the above mentioned provisions, depreciation for Ukai 1-5, Wanakbori 1-6, GTPS 3-4, Sikka 1-2, KLPTS 1-3, Utran gas, Ukai Hydro & Kadana Hydro has been spread over the balance useful life of the assets from FY 2017-18 onwards by GSECL.

For new R&M expenses to be incurred in the control period, weighted average depreciation rate of 5.28% has been considered in line with the norms. The depreciation calculation of GSECL for transferred stations is as mentioned below:

Table 6.18: Depreciation computation for transfer stations

Plant Name	Unit	2016-17				Balance Useful life of the plant
		Gross Block	Cumulative depreciation (31.03.2016)	90% of GFA	Balance depreciable Value	
Ukai 1-5	1-5	1460.84	1071.24	1314.75	243.52*	3 years
GTPS 1-4**	1-4	1081.90	561.00	973.71	412.71	9 years
Wanakbori 1-6	1-6	1822.11	1095.72	1639.90	544.18	5 years
Sikka 1-2	1-2	660.14	426.54	594.12	167.59	1 year
KLTPS 1-3	1-3	1284.92	796.05	1156.42	360.38	15 years
Ukai Hydro**	1-4	175.05	157.54	157.54	0.00	-
Kadana Hydro	1-4	325.57	178.05	293.02	114.97	16 years

* As Ukai1-2 units are being decommissioned at the end of FY18, the balance depreciation for Ukai1-2 viz. Rs. 108.41 Cr has been charged in FY18 and Rs. 135.10 Cr (=243.52-108.41) has been spread over 3 years.

**Gross block has been considered after negating gross block of GTPS 1-2 due to decommissioning. Gross block of GTPS 1-2 units is Rs. 523.42 Cr.

**Ukai hydro is completing its useful life by 2016-17 & balance depreciation as on 01.04.16 is considered in FY 2016-17.

GSECL has charged higher depreciation for Gandhinagar TPS 1-4 for phasing out of Unit No. 1&2. The Commission had not approved the higher depreciation in true-up of FY 2012-13, 2013-14 & 2014-15. Therefore, GSECL requested to approve Rs. 160.49 Cr in the tariff of FY 2017-18 as GSECL has decommissioned the Gandhinagar Unit 1 & 2 in September, 2016.

For units which are getting decommissioned, the gross block for such units has been negated in line with decommissioning schedule. The details are mentioned as below:



Table 6.19: Gross block of station to be decommissioned

Name of Station	Unit No.	Decommissioning Schedule	Gross block in Rs. Cr
Ukai	1	31 st Mar'18	649.02
	2		
Gandhinagar	1	03 rd Sep'16	523.42
	2		
Sikka	1	31 st Mar'18	684.44
	2		
Utran	GT - 1	22 nd Jan'17	398.99
	GT - 2		
	GT - 3		
	STG		

Table below indicates plant wise depreciation rates considered by GSECL.

Table 6.20: Depreciation rates as considered by GSECL for FY 2016-17 to 2020-21

(%)

Sr. No.	Plant	2016-17	2017-18	2018-19	2019-20	2020-21
1	Ukai (1-5)	5.41%	12.05%	5.96%	5.80%	2.65%
2	Gandhinagar (1-4)	7.31%	4.26%	4.26%	4.26%	4.26%
3	Wanakbori 1-6 TPS	5.49%	6.04%	6.22%	5.92%	5.85%
4	Sikka TPS	6.88%	52.52%	0.00%	0.00%	0.00%
5	KLTPS 1-3	5.23%	1.91%	1.93%	1.94%	1.96%
6	KLTPS 4	5.17%	5.17%	5.17%	5.17%	5.17%
7	Dhuvaran CCPP 2	4.74%	4.74%	4.74%	4.74%	4.74%
8	Ukai Hydro	30.39%	0.00%	0.00%	0.00%	0.00%
9	Kadana Hydro	5.29%	2.25%	2.26%	2.28%	2.29%
10	Ukai Extn. 6*	4.84%	4.84%	4.84%	4.84%	4.84%
11	Gandhinagar 5*	2.09%	0.00%	0.00%	0.00%	0.00%
12	Wanakbori 7 TPS*	1.05%	0.00%	0.00%	0.00%	0.00%
13	Dhuvaran CCPP 1*	5.28%	5.28%	5.28%	5.28%	5.28%
14	Dhuvaran CCPP 3*	4.91%	4.91%	4.91%	4.91%	4.91%
15	Utran (Gas)*	31.39%	0.00%	0.00%	0.00%	0.00%
16	Utran Extension*	4.89%	4.89%	4.89%	4.89%	4.89%
17	Sikka Extn. (3-4)*	5.28%	5.28%	5.28%	5.28%	5.28%
18	Wanakbori 8 TPS	5.28%	5.28%	5.28%	5.28%	5.28%
19	Dhuvaran STPS	5.28%	5.28%	5.28%	5.28%	5.28%

*PPA based stations

Due to decommissioning of Utran gas by FY 2016-17 as mentioned in above sections, balance depreciable value as on 01.04.2016 is considered in the FY 2016-17.



Similarly, as mentioned above, Ukai hydro being a transferred station is completing its useful life by 2016-17 & balance depreciation as on 01.04.16 is considered in FY 2016-17.

The table below indicates the plant wise Depreciation for FY 2016-17 to FY 2020-21 projected on the basis of revised estimates of FY 2015-16, proposed capitalization for the control period and above deprecation rates.

Table 6.21: Depreciation projected by GSECL for FY 2016-17 to 2020-21

(Rs. Crores)

Sr. No.	Power Station	2016-17	2017-18	2018-19	2019-20	2020-21
1	Ukai (1-5)	85.41	169.37	73.26	83.96	41.76
2	Ukai Extn. 6*	147.63	147.63	147.63	147.63	147.63
3	Gandhinagar (1-4)	57.59	46.50	46.68	46.85	46.92
4	Gandhinagar 5*	13.76	-	-	-	-
5	Wanakbori 1-6 TPS	104.13	122.04	138.82	144.74	148.54
6	Wanakbori 7 TPS*	6.68	-	-	-	-
7	Sikka TPS	46.25	179.74	-	-	-
8	KLTPS 1-3	67.36	24.77	25.10	25.45	25.71
9	KLTPS 4	35.71	36.03	36.18	36.29	36.44
10	Dhuvaran CCPP 1*	18.80	18.80	18.80	18.80	18.80
11	Dhuvaran CCPP 2	20.19	20.98	22.26	23.44	25.22
12	Dhuvaran CCPP 3*	79.54	79.54	79.54	79.54	79.54
13	Utran (Gas)*	62.62	-	-	-	-
14	Utran Extension*	66.31	66.49	66.55	66.55	66.55
15	Ukai Hydro	53.34	-	-	-	-
16	Kadana Hydro	17.25	7.38	7.46	7.57	7.65
17	Sikka Extn. (3-4)*	173.05	173.05	173.05	173.05	173.05
18	Wanakbori 8 TPS*	-	-	117.88	235.75	235.75
19	Dhuvaran STPS*	-	-	-	-	272.71
	Total	1055.62	1092.32	953.21	1089.62	1326.27

*PPA based stations

Commission's Analysis

The Commission has analyzed the submission made by the petitioner. It is noted that out of total 7 stations transferred to GSECL under FRP (Financial Restructuring Plan), the stations/Units shown in the Table 6.19 are planned to be decommissioned during FY 2016-17 and FY 2017-18. For the remaining stations received by GSECL under FRP and GSECL owned stations, depreciation has been calculated by the petitioner up to



90% of GFA of the respective stations. The balance depreciation deducting the accumulated depreciation from 90% value of GFA has been spread over the extended life of 35 years from the CoD of the transferred stations to reduce the burden on the consumers.

The petitioner has requested the Commission to allow the balance depreciation of the stations/Units to be decommissioned and Unit which has completed its useful life additionally up to the year of decommissioning or in the year of completion of useful life. In this regard, the Commission has decided to allow the recovery of depreciation till the date of decommissioning or completion of useful life as part of fixed cost recovery at the rate of depreciation considered while truing up of FY 2015-16. The balance depreciation of Ukai (1&2), Gandhinagar (1&2), Sikka (1&2), Utran Gas, and Ukai Hydro is to be adjusted against the sales proceeds of these units/stations and any loss/profit to be claimed in True-up of the Financial Years in which these assets are sold. The Commission shall allow the net gain / (loss) on account of sale of such discarded assets in the respective year(s) True-Up after prudence check. The Commission decided to consider the rate of depreciation as allowed while truing up of FY 2015-16 for Ukai (1-5), Gandhinagar (1-4), Sikka TPS, Wanakbori 1-6, KLTPS 1-3, Utran Gas, Ukai Hydro and Kadana Hydro for calculation of depreciation for the control period since depreciation projected by the petitioner is not in conformity with the MYT Regulations, 2016. For rest of the stations i.e. KLTPS 4, Dhuvaran CCPP 2, Ukai 6, Gandhinagar 5, Wanakbori 7, Dhuvaran CCPP 1 & 2, Utran Extn., Sikka 3 & 4, Wanakbori 8, and Dhuvaran STPS, the Commission has considered the rate of depreciation as projected by the petitioner, which is in conformity with the GERC (MYT) Regulations, 2016, for the calculation of depreciation for the control period. The plant-wise year-wise depreciation, applying the weighted average rate of depreciation as mentioned above, computed by Commission is given in the table below:

Table 6.22: Depreciation approved for FY 2016-17 to FY 2020-21

(Rs. Crores)

Sr. No.	Power station	2016-17	2017-18	2018-19	2019-20	2020-21
1	Ukai (1-5)	81.01	72.06	63.01	74.23	80.83
2	Gandhinagar (1-4)	68.97	55.81	55.98	56.15	56.27
3	Wanakbori 1-6 TPS	95.05	101.36	111.88	122.72	127.36
4	Sikka TPS	33.83	17.22	0.00	0.00	0.00
5	KLTPS 1-3	65.47	65.83	66.18	66.50	66.80
6	KLTPS 4	35.70	36.03	36.18	36.28	36.44
7	Dhuvaran CCPP 2	19.88	20.67	21.95	23.14	24.92
8	Ukai Hydro	9.08	0.00	0.00	0.00	0.00



Sr. No.	Power station	2016-17	2017-18	2018-19	2019-20	2020-21
9	Kadana Hydro	15.54	15.63	15.73	15.81	15.90
10	Ukai Extn. 6*	141.13	141.13	141.13	141.13	141.13
11	Gandhinagar 5*	13.75	0.00	0.00	0.00	0.00
12	Wanakbori 7 TPS*	6.68	0.00	0.00	0.00	0.00
13	Dhuvaran CCPP 1*	21.24	21.24	21.24	21.24	21.24
14	Dhuvaran CCPP 3*	76.43	76.43	76.43	76.43	76.43
15	Utran (Gas)*	11.79	0.00	0.00	0.00	0.00
16	Utran Extension*	66.29	66.47	66.54	66.54	66.54
17	Sikka Extn. (3-4)*	172.90	172.90	172.90	172.90	172.90
18	Wanakbori 8 TPS*	0.00	0.00	117.88	235.75	235.75
19	Dhuvaran STPS*	0.00	0.00	0.00	0.00	272.71
	TOTAL	934.75	862.79	967.03	1108.83	1395.21

* PPA governed stations

The Commission approves the depreciation charges plant-wise for the control period for FY 2016-17 to FY 2020-21 as detailed in the Table above.

Further, Regulation 39 of the GERC (MYT) Regulations, 2016 stipulates the methodology for the calculation of depreciation as under:

“The Generation Company or Transmission Licensee or SLDC or Distribution Licensee shall be permitted to recover depreciation on the value of fixed assets used in their respective Business computed in the following manner:

(a) The approved original cost of the project/fixed assets shall be the value base for calculation of depreciation;

(b) Depreciation shall be computed annually based on the straight line method at the rates specified in the Annexure I to these Regulations:

Provided that the remaining depreciable value as on 31st March of the year closing after a period of 12 years from date of commercial operation shall be spread over the balance useful life of the assets:

Provided further that for a Generating Company or a Transmission Licensee or SLDC or a Distribution Licensee formed as a result of a Transfer Scheme, the depreciation on assets transferred under the Transfer Scheme shall be charged as per rates specified in these Regulations for a period of 12 years from the date of the Transfer Scheme, and thereafter depreciation will be spread over the balance useful life of the assets:

.....”



In view of above, GSECL is hereby directed to calculate the depreciation from FY 2017-18 as per the aforesaid Regulation of the GERC (MYT) Regulations, 2016. For consideration of 12 years, GSECL shall consider 1st April, 2005 as the date of commencement of 12 years period. GSECL shall align its mechanism for calculation of Depreciation with the stipulations of Regulations and the Commission shall consider depreciation calculated as per the MYT Regulations, 2016 for truing up from FY 2017-18.

6.4.2 Interest and Finance charges for FY 2016-17 to FY 2020-21

GSECL has projected the interest and finance charges for the control period FY 2016-17 to FY 2020-21 station-wise as detailed in the Table below:

Table 6.23: Proposed Interest and Finance Charges for FY 2016-17 to 2020-21

(Rs. Crore)

Sr. No.	Power station	2016-17	2017-18	2018-19	2019-20	2020-21
1	Ukai (1-5)	11.22	20.33	28.18	39.67	44.52
2	Gandhinagar (1-4)	0.3	0.11	0.11	0.11	0.04
3	Wanakbori 1-6 TPS	4.69	12.19	24.27	35.67	38.28
4	Sikka TPS	0.82	-	-	-	-
5	KLTPS 1-3	0.23	0.25	0.21	0.22	0.17
6	KLTPS 4	23.03	19.73	16.17	12.48	8.9
7	Dhuvaran CCPP 2	12.91	11.9	11.57	10.93	11.03
8	Ukai Hydro	0.03	-	-	-	-
9	Kadana Hydro	0.04	0.09	0.05	0.07	0.05
10	Ukai Extn. 6*	164.88	150.09	135.33	120.11	105.34
11	Gandhinagar 5*	-	-	-	-	-
12	Wanakbori 7 TPS*	-	-	-	-	-
13	Dhuvaran CCPP 1*	-	-	-	-	-
14	Dhuvaran CCPP 3*	103.04	95.12	87.23	79.03	71.13
15	Utran (Gas)*	-	-	-	-	-
16	Utran Extension*	53.06	46.91	40.59	34.03	27.62
17	Sikka Extn. (3-4)*	214.72	197.41	180.13	162.25	144.97
18	Wanakbori 8 TPS*	-	-	145.12	280.47	257.71
19	Dhuvaran STPS*	-	-	-	-	335.74
	TOTAL	588.97	554.13	668.96	775.04	1045.50

* PPA based stations

GSECL has submitted that for existing loans, the Interest rate is assumed on the basis of estimates of FY 2015-16 and for new loan additions, interest rate of 9.65% has been considered in line with the present market scenario. It is stated that additional loans are assumed considering the proposed major and minor R&M expenditure. It is further stated that GSECL has estimated the other finance charges to be same as FY 2015-16 for entire control period.



GSECL has requested to approve the total interest and finance charges for each of the station for the control period FY 2016-17 to 2020-21 as projected by them in the petition.

Commission's Analysis

The Commission has examined the submission made by GSECL. The Commission has calculated interest charges by considering the closing loan portfolio for true-up year FY 2015-16 as opening portfolio of FY 2016-17 and so on. It is observed that the additional loans proposed for borrowing during the control period FY 2016-17 to FY 2020-21 are in line with the proposed capitalization towards R&M of the respective plants as well as capitalization for new plants (Wanakbori 8 and Dhuvaran STPS)

The Commission has also considered the weighted average rate of interest for each year of the control period for all the stations as given in the Table below:

Table 6.24: Weighted average interest rate for control period 2016-21

Sr. No.	Year	Weighted Avg. Interest Rate %
1	2016-17	9.83%
2	2017-18	9.67%
3	2018-19	9.60%
4	2019-20	9.51%
5	2020-21	9.51%

The other finance charges considered by the Commission are as per actuals of FY 2015-16.

GERC (MYT) Regulations, 2016 specify that repayment for the year during the tariff period from FY 2016-17 to FY 2020-21 shall be deemed to be equal to the depreciation allowed for that year. The year-wise and plant-wise depreciation approved in para 6.4.1 above is taken as repayment of loan.

The Commission, accordingly approves the interest and finance charges as indicated in the Table below:

Table 6.25: Interest and finance charges approved by the Commission for FY 2016-17 to FY 2020-21

(Rs. Crore)						
Sr. No.	Power station	2016-17	2017-18	2018-19	2019-20	2020-21
1	Ukai (1-5)	22.29	24.73	28.08	35.79	36.94
2	Gandhinagar (1-4)	17.80	11.90	6.67	2.07	0.08
3	Wanakbori 1-6 TPS	18.58	17.25	20.92	23.88	18.12



Sr. No.	Power station	2016-17	2017-18	2018-19	2019-20	2020-21
4	Sikka TPS	1.54	0.35	0.00	0.00	0.00
5	KLTPS 1-3	5.18	1.08	0.01	0.01	0.01
6	KLTPS 4	22.66	19.26	15.85	12.39	9.13
7	Dhuvaran CCPP 2	9.74	8.75	8.46	7.90	8.11
8	Ukai Hydro	3.03	2.57	2.55	2.53	2.53
9	Kadana Hydro	0.17	0.00	0.00	0.00	0.00
10	Ukai Extn. 6*	157.34	141.16	126.61	112.02	98.59
11	Gandhinagar 5*	0.00	0.00	0.00	0.00	0.00
12	Wanakbori 7 TPS*	0.00	0.00	0.00	0.00	0.00
13	Dhuvaran CCPP 1*	0.00	0.00	0.00	0.00	0.00
14	Dhuvaran CCPP 3*	96.59	87.63	79.65	71.64	64.37
15	Utran (Gas)*	1.18	0.00	0.00	0.00	0.00
16	Utran Extension*	58.10	50.99	44.32	37.58	31.25
17	Sikka Extn. (3-4)*	217.49	197.24	179.22	161.10	144.66
18	Wanakbori 8 TPS*	0.00	0.00	144.37	274.82	252.40
19	Dhuvaran STPS*	0.00	0.00	0.00	0.00	330.87
	TOTAL	631.70	562.91	656.70	741.72	997.07

* PPA based stations

6.4.3 Return on Equity

Petitioner's Submission

GSECL has projected the return on equity for the control period i.e. FY 2016-17 to FY 2020-21 as detailed in the Table given below:

Table 6.26: Return on equity projected for FY 2016-17 to FY 2020-21

(Rs. Crore)

Sr. No.	Power station	2016-17	2017-18	2018-19	2019-20	2020-21
1	Ukai (1-5)	33.29	33.62	33.87	43.02	48.4
2	Gandhinagar (1-4)	34.62	28.17	28.31	28.45	28.55
3	Wanakbori 1-6 TPS	69.13	74.38	83.15	92.18	96.05
4	Sikka TPS	23.62	12.06	-	-	-
5	KLTPS 1-3	48.23	48.53	48.82	49.09	49.33
6	KLTPS 4	28.87	29.14	29.26	29.34	29.47
7	Dhuvaran CCPP 2	17.4	18.1	19.23	20.28	21.86
8	Ukai Hydro	10.42	10.44	10.44	10.44	10.44
9	Kadana Hydro	28.5	28.58	28.66	28.74	28.81
10	Ukai Extn. 6*	128.08	128.08	128.08	128.08	128.08
11	Gandhinagar 5*	26.85	26.85	26.85	26.85	26.85
12	Wanakbori 7 TPS*	26.05	26.05	26.05	26.05	26.05
13	Dhuvaran CCPP 1*	11.2	11.2	11.2	11.2	11.2
14	Dhuvaran CCPP 3*	65.71	65.71	65.71	65.71	65.71
15	Utran (Gas)*	5.5	-	-	-	-
16	Utran Extension*	57.34	57.5	57.55	57.55	57.55
17	Sikka Extn. (3-4)*	137.53	137.53	137.53	137.53	137.53



Sr. No.	Power station	2016-17	2017-18	2018-19	2019-20	2020-21
18	Wanakbori 8 TPS*	-	-	93.77	187.53	187.53
19	Dhuvaran STPS*	-	-	-	-	216.93
	TOTAL	752.34	735.94	828.48	942.04	1170.34

* PPA based stations

GSECL has submitted that return on equity for the control period of FY 2016-17 to FY 2020-21 has been computed on normative basis at 14% for all transferred stations (non PPA based stations) and for new projects in line with GERC (MYT) Regulations, 2016. GSECL has considered closing equity for FY 2015-16 as the opening equity for FY 2016-17 and addition to the equity expected during the year based on the normative equity contribution towards the projected capital expenditure in FY 2016-17. The same has also been done for the remaining control period. For plants that are decommissioned, equity has been correspondingly reduced by GSECL as given in the Table below:

Table 6.27: Equity reduction for decommissioning units

(Rs. Crore)

Name of Station	Unit No.	Decommissioning Schedule	Equity Contribution in Rs. Cr.
Ukai	1	31 st Mar'18	85.73
	2		
Gandhinagar	1	03 rd Sep'16	95.82
	2		
Sikka	1&2	31 st Mar'18	172.34
Utran	GT - 1	22 nd Jan'17	84.61
	GT - 2		
	GT - 3		
	STG		

Commission's Analysis

The Commission has observed that the equity additions proposed for the control period by GSECL are in line with the proposed capital expenditure during the control period towards major and minor R&M works in the petition.

The Commission has considered the closing equity as per true-up value of FY 2015-16 as opening equity for FY 2016-17 and so on. The equity addition is considered to be the normative equity as per capitalization approved. For plants that are being decommissioned, equity has been reduced to the extent of 30% of GFA vaule of



decommissioned assets. The RoE for the control period computed plant-wise / year-wise as per the approved rates of equity are given in the Table below:

**Table 6.28: Return on equity approved by the Commission for
FY 2016-17 to FY 2020-21**

(Rs. Crore)

Sr. No.	Power station	2016-17	2017-18	2018-19	2019-20	2020-21
1	Ukai (1-5)	33.00	25.70	18.32	27.47	32.86
2	Gandhinagar (1-4)	28.03	17.30	17.44	17.58	17.67
3	Wanakbori 1-6 TPS	68.73	73.98	82.76	91.78	95.65
4	Sikka TPS	23.55	9.74	0.00	0.00	0.00
5	KLTPS 1-3	48.17	48.47	48.76	49.03	49.27
6	KLTPS 4	28.93	29.20	29.32	29.40	29.53
7	Dhuvaran CCPP 2	14.04	14.74	15.87	16.92	18.49
8	Ukai Hydro	10.41	10.42	10.42	10.42	10.42
9	Kadana Hydro	28.53	28.60	28.69	28.76	28.84
10	Ukai Extn. 6*	122.46	122.46	122.46	122.46	122.46
11	Gandhinagar 5*	30.88	30.88	30.88	30.88	30.88
12	Wanakbori 7 TPS*	28.03	28.03	28.03	28.03	28.03
13	Dhuvaran CCPP 1*	11.07	11.07	11.07	11.07	11.07
14	Dhuvaran CCPP 3*	65.36	65.36	65.36	65.36	65.36
15	Utran (Gas)*	3.47	0.00	0.00	0.00	0.00
16	Utran Extension*	57.39	57.55	57.60	57.60	57.60
17	Sikka Extn. (3-4)*	137.53	137.53	137.53	137.53	137.53
18	Wanakbori 8 TPS*	0.00	0.00	93.77	187.53	187.53
19	Dhuvaran STPS*	0.00	0.00	0.00	0.00	216.93
	TOTAL	739.58	711.04	798.28	911.84	1140.13

* PPA based stations

The Commission approves the RoE as detailed in the Table-above for the control period for FY 2016-17 to FY 2020-21.

6.4.4 Operations and Maintenance (O&M) Expenses

Petitioner's Submission

GSECL has projected the O&M expenses for the control period for FY 2016-17 to FY 2020-21 as detailed in the Table below:



Table 6.29: Proposed O&M Expenses for FY 2016-17 to 2020-21

(Rs. Crore)

Sr. No.	Power station	2016-17	2017-18	2018-19	2019-20	2020-21
1	Ukai (1-5)	220.09	232.68	176.54	186.63	197.31
2	Gandhinagar (1-4)	111.05	94.36	99.75	105.46	111.49
3	Wanakbori 1-6 TPS	236.32	249.84	264.13	279.24	295.21
4	Sikka TPS	79.92	84.49	-	-	-
5	KLTPS 1-3	106.45	112.54	118.98	125.79	132.98
6	KLTPS 4	18.9	19.98	21.12	22.33	23.61
7	Dhuvaran CCPP 2	31.96	33.78	35.72	37.76	39.92
8	Ukai Hydro	23.37	24.71	26.12	27.62	29.2
9	Kadana Hydro	25.97	27.46	29.03	30.69	32.44
10	Ukai Extn. 6*	99.07	104.72	110.74	117.05	123.74
11	Gandhinagar 5*	24.53	25.93	27.42	28.98	30.64
12	Wanakbori 7 TPS*	20.98	22.18	23.45	24.79	26.20
13	Dhuvaran CCPP 1*	31.78	33.60	35.52	37.55	39.70
14	Dhuvaran CCPP 3*	68.84	72.79	76.95	81.35	86.00
15	Utran (Gas)*	30.51	0.00	0.00	0.00	0.00
16	Utran Extension*	56.16	59.37	62.77	66.36	70.15
17	Sikka Extn. (3-4)*	99.07	104.72	110.74	117.05	123.74
18	Wanakbori 8 TPS*	-	-	137.43	145.25	153.54
19	Dhuvaran STPS*	-	-	-	-	361.28
	TOTAL	1284.97	1303.15	1356.41	1433.90	1877.15

#O&M Charges are exclusive of Water Charges

* PPA based stations

GSECL has submitted that O&M expenses for the control period of FY 2016-17 to FY 2020-21 have been computed on normative basis in line with provisions mentioned in the GERC (MYT) Regulations, 2016. Further GSECL claimed that in line with the GERC (MYT) Regulations, 2016 norms, multiplication factor of 0.85 has been considered for calculating O&M expenses for Wanakbori-8. GSECL has also taken Rs. 110.54 Crores as 7th Pay Commission impact in FY 2016-17. Furthermore, O&M expenses for Ukai 1-5, GTPS 1-4 & Utran gas have been proportionately reduced due to decommissioning of their units. The O&M expenses consist of Employee cost, A&G expenses, and R&M expenses.

Commission's Analysis

The Commission has examined the O&M expenses for control period submitted by GSECL. GSECL has projected the O&M charges based on the GERC (MYT) Regulations, 2016. These Regulations specified the O&M expenses (Rs. Lakh / MW) with an annual escalation of 5.72%. Further, for existing stations the actual O&M expenses of three years starting FY 2012-13 to FY 2014-15 to be averaged to arrive at the O&M expense of year FY 2013-14. This average of O&M expenses is to be



escalated at 5.72% YoY to arrive at the year wise O&M expense for the complete control period. GSECL has computed the O&M charges for new stations as per the GERC (MYT) Regulations, 2016 excluding the water charges for each station and then added the provision for the 7th Pay Commission impact. Commission is of the view that 7th Pay Commission impact will be approved in the respective true-up year. Hence, Commission has calculated the O&M expenses without considering 7th Pay Commission impact. For the units which are getting decommissioned in the control period, the corresponding O&M has been reduced accordingly.

Based on above, the stationwise O&M expenses computed by the Commission as per the GERC (MYT) Regulations, 2016 excluding water charge for the control period from FY 2016-17 to FY 2020-21 are given in the Table below:

Table 6.30: Approved O&M charges for FY 2016-17 to FY 2020-21

(Rs. Crore)

Sr. No.	Power station	2016-17	2017-18	2018-19	2019-20	2020-21
1	Ukai (1-5)	205.35	217.09	164.71	174.13	184.09
2	Gandhinagar (1-4)	101.98	86.65	91.61	96.85	102.39
3	Wanakbori 1-6 TPS	214.46	226.73	239.70	253.41	267.91
4	Sikka TPS	75.76	80.09	0.00	0.00	0.00
5	KLTPS 1-3	102.72	108.60	114.81	121.38	128.32
6	KLTPS 4	17.60	18.60	19.67	20.79	21.98
7	Dhuvaran CCPP 2	30.00	31.72	33.54	35.45	37.48
8	Ukai Hydro	18.08	19.12	20.21	21.37	22.59
9	Kadana Hydro	21.77	23.02	24.34	25.73	27.20
10	Ukai Extn. 6*	76.84	81.22	101.05	106.80	112.90
11	Gandhinagar 5*	20.89	22.08	23.34	24.68	26.09
12	Wanakbori 7 TPS*	17.33	18.33	19.37	20.48	21.65
13	Dhuvaran CCPP 1*	29.93	31.64	33.45	35.37	37.39
14	Dhuvaran CCPP 3*	62.32	65.88	69.65	73.64	77.85
15	Utran (Gas)*	28.60	0.00	0.00	0.00	0.00
16	Utran Extension*	49.66	52.50	55.50	58.68	62.03
17	Sikka Extn. (3-4)*	85.88	90.77	101.05	106.80	112.90
18	Wanakbori 8 TPS*	0.00	0.00	137.43	145.25	153.54
19	Dhuvaran STPS*	0.00	0.00	0.00	0.00	361.28
	TOTAL	1159.18	1174.05	1249.43	1320.80	1757.60

* PPA based stations

The Commission accordingly approves the O&M expenses for the control period FY 2016-17 to FY 2020-21 as detailed in the table above.



6.4.5 Water charges for FY 2016-17 to FY 2020-21

Petitioner's Submission

GSECL has projected the water charges for the control period for the FY 2016-17 to FY 2020-21 as detailed in the Table below:

Table 6.31: Proposed water charges for FY 2016-17 to 2020-21

(Rs. Crore)						
Sr. No.	Power station	2016-17	2017-18	2018-19	2019-20	2020-21
1	Ukai (1-5)	0.14	0.16	0.13	0.14	0.15
2	Gandhinagar (1-4)	9.59	8.48	9.32	10.26	11.28
3	Wanakbori 1-6 TPS	39.34	43.27	47.6	52.36	57.6
4	Sikka TPS	2.51	2.76	-	-	-
5	KLTPS 1-3	0.47	0.52	0.57	0.63	0.69
6	KLTPS 4	0.14	0.16	0.18	0.19	0.21
7	Dhuvaran CCPP 2	0.84	0.92	1.02	1.12	1.23
8	Ukai Hydro	-	-	-	-	-
9	Kadana Hydro	-	-	-	-	-
10	Ukai Extn. 6*	0.11	0.13	0.14	0.15	0.17
11	Gandhinagar 5*	13.06	14.37	15.8	17.38	19.12
12	Wanakbori 7 TPS*	9.00	9.90	10.89	11.98	13.18
13	Dhuvaran CCPP 1*	0.24	0.26	0.29	0.31	0.35
14	Dhuvaran CCPP 3*	-	-	-	-	-
15	Utran (Gas)*	0.05	-	-	-	-
16	Utran Extension*	4.01	4.41	4.85	5.33	5.87
17	Sikka Extn. (3-4)*	1.30	1.43	1.58	1.74	1.91
18	Wanakbori 8 TPS*	-	-	-	-	-
19	Dhuvaran STPS*	-	-	-	-	-
	TOTAL	80.80	86.77	92.37	101.59	111.76

*PPA governed stations.

GSECL has submitted that it has computed the water charges for the third control period FY 2016-17 to FY 2020-21 by considering base charges for FY 2015-16 with an escalation of 10% YoY. GSECL has further submitted that water charges for Ukai 1-5, GTPS 1-4 & Utran gas has been proportionately reduced due to decommissioning of their units. Water Charges for Wanakbori-8, Dhuvaran STPS, Dhuvaran-3 shall be recovered from beneficiaries as per actual for respective year.

Commission's Analysis

The Commission has observed that the water charges are quite substantial as noted from the accounts for the past five years from FY 2011-12 to FY 2015-16. The water charges are payable to the Government of Gujarat. However, the Commission is not in favour of considering annual escalation of these water charges. The water charges,



which are in the nature of levy, may not be increased every year. The water used for consumption may not increase as number of units are getting decommissioned in the control period. The Commission is of the opinion that the water charges shall be considered at the level of actuals of FY 2015-16 after reducing water charge for the stations proposed to be decommissioned for the control period. Any increase in the cost of water shall be considered at the time of truing up based on the audited annual accounts for the respective years.

Further, for the new stations i.e. Wanakbori 8 and Dhuvaran STPS, GSECL recover the actually paid water charges from its beneficiaries.

The Commission accordingly approves the water charges for the control period from FY 2016-17 to FY 2020-21 as detailed in the Table below:

**Table 6.32: Water charges approved by the Commission for
FY 2016-17 to FY 2020-21**

(Rs. Crore)						
Sr. No.	Power station	2016-17	2017-18	2018-19	2019-20	2020-21
1	Ukai (1-5)	0.13	0.13	0.10	0.10	0.10
2	Gandhinagar (1-4)	8.67	7.01	7.01	7.01	7.01
3	Wanakbori 1-6 TPS	35.76	35.76	35.76	35.76	35.76
4	Sikka TPS	2.28	2.28	-	-	-
5	KLTPS 1-3	0.43	0.43	0.43	0.43	0.43
6	KLTPS 4	0.13	0.13	0.13	0.13	0.13
7	Dhuvaran CCPP 2	0.76	0.76	0.76	0.76	0.76
8	Ukai Hydro	-	-	-	-	-
9	Kadana Hydro	-	-	-	-	-
10	Ukai Extn. 6*	0.10	0.10	0.10	0.10	0.10
11	Gandhinagar 5*	11.87	11.87	11.87	11.87	11.87
12	Wanakbori 7 TPS*	8.18	8.18	8.18	8.18	8.18
13	Dhuvaran CCPP 1*	0.21	0.21	0.21	0.21	0.21
14	Dhuvaran CCPP 3*	0.00	0.00	0.00	0.00	0.00
15	Utran (Gas)*	0.06	-	-	-	-
16	Utran Extension*	3.64	3.64	3.64	3.64	3.64
17	Sikka Extn. (3-4)*	1.19	1.19	1.19	1.19	1.19
18	Wanakbori 8 TPS*	0	0	0	0	0
19	Dhuvaran STPS*	0	0	0	0	0
	TOTAL	73.44	71.71	69.39	69.39	69.39

* PPA based stations

6.4.6 Interest on working capital for FY 2016-17 to FY 2020-21

GSECL has projected the interest on working capital for the control period for the FY 2016-17 to FY 2020-21 as detailed in the Table below:



Table 6.33: Proposed Interest on working capital for FY 2016-17 to 2020-21

(Rs. Crore)						
Sr. No.	Power station	2016-17	2017-18	2018-19	2019-20	2020-21
1	Ukai (1-5)	38.08	54.55	39.96	39.97	40.47
2	Gandhinagar (1-4)	35.85	28.98	29.86	30.77	31.71
3	Wanakbori 1-6 TPS	86.51	89.64	92.11	85.65	94.07
4	Sikka TPS	18.45	20.02	-	-	-
5	KLTPS 1-3	11.61	11.48	11.84	12.21	12.6
6	KLTPS 4	4.33	4.51	4.58	4.65	4.72
7	Dhuvaran CCPP 2	5.24	5.47	5.75	6.04	6.35
8	Ukai Hydro	1.28	0.78	0.81	0.84	0.87
9	Kadana Hydro	1.33	1.27	1.3	1.34	1.38
10	Ukai Extn. 6*	35.47	36.16	36.93	37.72	38.55
11	Gandhinagar 5*	13.25	13.51	13.92	14.33	14.77
12	Wanakbori 7 TPS*	12.48	13.13	13.52	13.92	14.34
13	Dhuvaran CCPP 1*	4.86	5.03	5.25	5.48	5.73
14	Dhuvaran CCPP 3*	26.8	29.24	30.42	31.67	32.98
15	Utran (Gas)*	8.55	-	-	-	-
16	Utran Extension*	25.58	26.66	27.78	28.96	30.2
17	Sikka Extn. (3-4)*	35.79	37.3	37.54	38.3	39.1
18	Wanakbori 8 TPS*	-	-	46.78	55.62	55.56
19	Dhuvaran STPS*	-	-	-	-	96.36
	TOTAL	365.46	377.73	398.35	407.47	519.76

* PPA based stations

GSECL has submitted that the interest on working capital and interest rate is worked out on normative basis and is based on norms specified under the GERC (MYT) Regulations, 2016 issued by the Commission. The interest rate for MYT period has been determined as 11.70% as per the above mentioned provisions.

GSECL also submitted that Interest on working capital for Ukai 1-5, GTPS 1-4 & Utran gas has been proportionately reduced due to decommissioning of their units.

Commission's Analysis

The Commission has examined the submission of GSECL and found that the working capital and the interest on the working capital have been computed by GSECL on normative basis in accordance with GERC (MYT) Regulations, 2016. The rate of interest as per Regulations is taken as 11.70%.

The Commission has arrived at the interest on working capital in accordance with GERC (MYT) Regulations, 2016. The closing GFA of 2015-16 of each plant is taken as opening GFA for year 2016-17 for calculating spares. Fuel costs and SFO costs are calculated on approved performance parameters. Approved O&M costs have been



taken to calculate 1 month O&M requirement. The interest on working capital is calculated and approved as detailed in the Table below:

Table 6.34: Approved Interest on Working Capital for FY 2016-17 to FY 2020-21

(Rs. Crore)

Sr. No.	Power station	2016-17	2017-18	2018-19	2019-20	2020-21
1	Ukai (1-5)	37.47	41.34	30.03	29.93	30.30
2	Gandhinagar (1-4)	27.43	22.33	22.36	22.47	22.52
3	Wanakbori 1-6 TPS	62.51	67.10	66.86	67.24	66.99
4	Sikka TPS	13.29	13.89	0.00	0.00	0.00
5	KLTPS 1-3	8.43	8.52	8.65	8.80	8.94
6	KLTPS 4	3.34	3.36	3.36	3.35	3.35
7	Dhuvaran CCPP 2	5.52	5.72	5.81	5.90	6.00
8	Ukai Hydro	0.77	0.70	0.72	0.74	0.76
9	Kadana Hydro	1.23	1.26	1.29	1.32	1.35
10	Ukai Extn. 6*	29.34	29.66	29.92	29.95	29.88
11	Gandhinagar 5*	16.29	14.59	14.64	14.70	14.70
12	Wanakbori 7 TPS*	10.71	11.35	11.44	11.49	11.49
13	Dhuvaran CCPP 1*	4.98	5.15	5.19	5.24	5.27
14	Dhuvaran CCPP 3*	12.83	13.10	13.10	13.12	13.11
15	Utran (Gas)*	4.94	0.00	0.00	0.00	0.00
16	Utran Extension*	18.65	19.19	19.18	19.22	19.18
17	Sikka Extn. (3-4)*	28.33	29.25	29.30	29.29	29.20
18	Wanakbori 8 TPS*	0.00	0.00	46.77	55.68	55.51
19	Dhuvaran STPS*	0.00	0.00	0.00	0.00	96.31
	TOTAL	286.07	286.51	308.62	318.45	414.85

* PPA based stations

The Commission, accordingly, approves the interest on working capital as detailed in the Table above.

6.4.7 Tax on income for FY 2016-17 to FY 2020-21

Petitioner's Submission

GSECL has calculated tax in line with the provisions of GERC (MYT) Regulations, 2016, GSECL has computed the tax for the control period FY 2016-17 to 2020-21 by considering the tax expense incurred during the FY 15-16 as detailed in the Table below:



Table 6.35: Tax on Income Projected for FY 2016-17 to 2020-21

(Rs. Crore)

Sr. No.	Power station	2016-17	2017-18	2018-19	2019-20	2020-21
1	Ukai (1-5)	4.83	4.83	3.47	3.47	3.47
2	Gandhinagar (1-4)	2.97	2.39	2.39	2.39	2.39
3	Wanakbori 1-6 TPS	7.17	7.17	7.17	7.17	7.17
4	Sikka TPS	1.37	1.37	-	-	-
5	KLTPS 1-3	1.22	1.22	1.22	1.22	1.22
6	KLTPS 4	0.43	0.43	0.43	0.43	0.43
7	Dhuvaran CCPP 2	0.64	0.64	0.64	0.64	0.64
8	Ukai Hydro	1.73	1.73	1.73	1.73	1.73
9	Kadana Hydro	1.38	1.38	1.38	1.38	1.38
10	Ukai Extn. 6*	2.84	2.84	2.84	2.84	2.84
11	Gandhinagar 5*	1.19	1.19	1.19	1.19	1.19
12	Wanakbori 7 TPS*	1.19	1.19	1.19	1.19	1.19
13	Dhuvaran CCPP 1*	0.61	0.61	0.61	0.61	0.61
14	Dhuvaran CCPP 3*	2.14	2.14	2.14	2.14	2.14
15	Utran (Gas)*	0.62	-	-	-	-
16	Utran Extension*	2.13	2.13	2.13	2.13	2.13
17	Sikka Extn. (3-4)*	2.84	2.84	2.84	2.84	2.84
18	Wanakbori 8 TPS*	-	-	-	-	-
19	Dhuvaran STPS*	-	-	-	-	-
	TOTAL	35.30	34.10	31.37	31.37	31.37

* PPA based stations

GSECL has further submitted that Tax for Wanakbori-8, Dhuvaran STPS shall be recovered from beneficiaries as per actual for respective year. Further, the tax has been reduced proportionately due to decommissioning of units in respective year of control period.

Commission's Analysis

The Commission is of the opinion that the tax on the income shall be allowed as per GERC (MYT) Regulations 2016. The Commission provisionally approves the income tax payable for each year of the control period as submitted by the petitioner.

The Commission accordingly approves the income tax for the control period FY 2016-17 to FY 2020-21 as submitted by the petitioner. Any variation in income tax actually paid and approved shall be reimbursed based on documentary evidence at the time of truing up for each year of the control period in accordance with GERC (MYT) Regulations 2016.

Further, for the new stations i.e. Wanakbori 8 and Dhruvaran STPS, GSECL recover the actually paid income tax from its beneficiaries.



The Commission approves the tax on income as detailed in the Table below for FY 2016-17 to 2020-21.

Table 6.36: Tax on Income Approved for FY 2016-17 to FY 2020-21

(Rs. Crore)

Sr. No.	Power station	2016-17	2017-18	2018-19	2019-20	2020-21
1	Ukai (1-5)	4.83	4.83	3.47	3.47	3.47
2	Gandhinagar (1-4)	2.97	2.39	2.39	2.39	2.39
3	Wanakbori 1-6 TPS	7.17	7.17	7.17	7.17	7.17
4	Sikka TPS	1.37	1.37	-	-	-
5	KLTPS 1-3	1.22	1.22	1.22	1.22	1.22
6	KLTPS 4	0.43	0.43	0.43	0.43	0.43
7	Dhuvaran CCPP 2	0.64	0.64	0.64	0.64	0.64
8	Ukai Hydro	1.73	1.73	1.73	1.73	1.73
9	Kadana Hydro	1.38	1.38	1.38	1.38	1.38
10	Ukai Extn. 6*	2.84	2.84	2.84	2.84	2.84
11	Gandhinagar 5*	1.19	1.19	1.19	1.19	1.19
12	Wanakbori 7 TPS*	1.19	1.19	1.19	1.19	1.19
13	Dhuvaran CCPP 1*	0.61	0.61	0.61	0.61	0.61
14	Dhuvaran CCPP 3*	2.14	2.14	2.14	2.14	2.14
15	Utran (Gas)*	0.62	-	-	-	-
16	Utran Extension*	2.13	2.13	2.13	2.13	2.13
17	Sikka Extn. (3-4)*	2.84	2.84	2.84	2.84	2.84
18	Wanakbori 8 TPS*	-	-	-	-	-
19	Dhuvaran STPS*	-	-	-	-	-
	TOTAL	35.30	34.10	31.37	31.37	31.37

* PPA based stations

6.4.8 SLDC charges for FY 2016-17 to 2020-21

Petitioner's Submission

GSECL has projected the SLDC fees & charges plant wise for the control period FY 16-17 to FY 20-21 in the same manner as O&M expenses by considering average charge for last 3 years & escalations at 5.72%. For Stations such as Dhuvaran-3 & Sikka 3-4 where no SLDC charges are available, GSECL has taken approved values for FY 2015-16 with an escalation of 5.72% thereafter for the remaining years in the control period. GSECL further submitted that SLDC charges for Ukai 1-5, GTPS 1-4 & Utran gas has been proportionately reduced due to decommissioning of their units. Furthermore, SLDC charges for Wanakbori-8, Dhuvaran STPS shall be recovered from beneficiaries as per actual for respective year. The SLDC charges projected by GSECL are given in the Table below:



Table 6.37: Projected SLDC charges for FY 2016-17 to 2020-21

(Rs. Crore)						
Sr. No.	Power station	2016-17	2017-18	2018-19	2019-20	2020-21
1	Ukai (1-5)	0.71	0.75	0.57	0.6	0.64
2	Gandhinagar (1-4)	0.46	0.39	0.42	0.44	0.47
3	Wanakbori 1-6 TPS	0.96	1.02	1.07	1.14	1.2
4	Sikka TPS	0.19	0.2	-	-	-
5	KLTPS 1-3	0.2	0.21	0.22	0.23	0.25
6	KLTPS 4	0.02	0.02	0.03	0.03	0.03
7	Dhuvaran CCPP 2	0.06	0.07	0.07	0.07	0.08
8	Ukai Hydro	0.19	0.21	0.22	0.23	0.24
9	Kadana Hydro	0.18	0.19	0.2	0.21	0.22
10	Ukai Extn. 6*	0.4	0.42	0.45	0.47	0.5
11	Gandhinagar 5*	0.06	0.06	0.07	0.07	0.07
12	Wanakbori 7 TPS*	0.06	0.06	0.06	0.07	0.07
13	Dhuvaran CCPP 1*	0.06	0.07	0.07	0.07	0.08
14	Dhuvaran CCPP 3*	0.17	0.18	0.19	0.2	0.21
15	Utran (Gas)*	0.51	-	-	-	-
16	Utran Extension*	0.17	0.17	0.18	0.2	0.21
17	Sikka Extn. (3-4)*	0.23	0.25	0.26	0.27	0.29
18	Wanakbori 8 TPS*	-	-	-	-	-
19	Dhuvaran STPS*	-	-	-	-	-
	TOTAL	4.63	4.27	4.08	4.30	4.56

* PPA based stations

Commission's Analysis

The Commission has analyzed the submission of GSECL. GSECL has projected SLDC charges in the same manner like O&M expenses and escalated the average of three years preceding and including 2014-15 by 5.72% to project for the control period. Commission is of the view that SLDC charges cannot be projected and escalated like other expenses. Commission therefore considers SLDC charges as the average of three years i.e. FY 2012-13, FY 2013-14, and FY 2014-15. The average is kept constant for all years of the control period. For Dhuvaran CCPP 3 and Sikka 3&4, the Commission has considered SLDC charges as projected by the petitioner. Any variation in the charges will be taken up during true-up and as verified from the audited accounts.

Further, for the new stations i.e. Wanakbori 8 and Dhruvaran STPS, GSECL will recover the actually paid SLDC charges from its beneficiaries.

The Commission accordingly approves the SLDC charges for the FY 2016-17 and considers the same charges for the remaining years FY 2017-18 to FY 2020-21. The SLDC charges for the control period FY 2016-17 to FY 2020-21 are detailed in the Table below:



Table 6.38: Approved SLDC Charges for FY 2016-17 to FY 2020-21

(Rs. Crore)						
Sr. No.	Power station	2016-17	2017-18	2018-19	2019-20	2020-21
1	Ukai (1-5)	0.60	0.6	0.6	0.6	0.6
2	Gandhinagar (1-4)	0.50	0.5	0.5	0.5	0.5
3	Wanakbori 1-6 TPS	0.81	0.81	0.81	0.81	0.81
4	Sikka TPS	0.16	0.16	0.00	0.00	0.00
5	KLTPS 1-3	0.17	0.17	0.17	0.17	0.17
6	KLTPS 4	0.02	0.02	0.02	0.02	0.02
7	Dhuvaran CCPP 2	0.05	0.05	0.05	0.05	0.05
8	Ukai Hydro	0.17	0.17	0.17	0.17	0.17
9	Kadana Hydro	0.15	0.15	0.15	0.15	0.15
10	Ukai Extn. 6*	0.34	0.34	0.34	0.34	0.34
11	Gandhinagar 5*	0.05	0.05	0.05	0.05	0.05
12	Wanakbori 7 TPS*	0.05	0.05	0.05	0.05	0.05
13	Dhuvaran CCPP 1*	0.05	0.05	0.05	0.05	0.05
14	Dhuvaran CCPP 3*	0.17	0.17	0.17	0.17	0.17
15	Utran (Gas)*	0.53	0.00	0.00	0.00	0.00
16	Utran Extension*	0.14	0.14	0.14	0.14	0.14
17	Sikka Extn. (3-4)*	0.23	0.23	0.23	0.23	0.23
18	Wanakbori 8 TPS*	0.00	0.00	0.00	0.00	0.00
19	Dhuvaran STPS*	0.00	0.00	0.00	0.00	0.00
	TOTAL	4.19	3.66	3.50	3.50	3.50

* PPA based stations

6.4.9 Non-Tariff Income

Petitioner's Submission

GSECL submitted that non-tariff income has been computed based on the indicative heads mentioned in the GERC (MYT) Regulations, 2016. Non-Tariff income has been considered to be same as in FY 2015-16 but GSECL has not considered the fly ash income in Non-Tariff income. GSECL further submitted that non-tariff income for Ukai 1-5, GTPS 1-4 & Utran gas has been proportionately reduced due to decommissioning of their units.

The non-tariff income projected and proposed by the petitioner is as below:

Table 6.39: Projected Non-Tariff Income for FY 2016-17 to FY 2020-21

(Rs. Crore)						
Sr. No.	Power station	2016-17	2017-18	2018-19	2019-20	2020-21
1	Ukai (1-5)	13.45	13.45	9.65	9.65	9.65
2	Gandhinagar (1-4)	9.2	7.39	7.39	7.39	7.39
3	Wanakbori 1-6 TPS	26.31	26.31	26.31	26.31	26.31
4	Sikka TPS	5.2	5.2	-	-	-



Sr. No.	Power station	2016-17	2017-18	2018-19	2019-20	2020-21
5	KLTPS 1-3	4.83	4.83	4.83	4.83	4.83
6	KLTPS 4	1.65	1.65	1.65	1.65	1.65
7	Dhuvaran CCPP 2	1.81	1.81	1.81	1.81	1.81
8	Ukai Hydro	3.51	3.51	3.51	3.51	3.51
9	Kadana Hydro	3.06	3.06	3.06	3.06	3.06
10	Ukai Extn. 6*	6.48	6.48	6.48	6.48	6.48
11	Gandhinagar 5*	3.42	3.42	3.42	3.42	3.42
12	Wanakbori 7 TPS*	2.42	2.42	2.42	2.42	2.42
13	Dhuvaran CCPP 1*	1.74	1.74	1.74	1.74	1.74
14	Dhuvaran CCPP 3*	4.32	4.32	4.32	4.32	4.32
15	Utran (Gas)*	1.51	-	-	-	-
16	Utran Extension*	5.69	5.69	5.69	5.69	5.69
17	Sikka Extn. (3-4)*	8.19	8.19	8.19	8.19	8.19
18	Wanakbori 8 TPS*	-	-	-	-	-
19	Dhuvaran STPS*	-	-	-	-	-
	TOTAL	102.79	99.47	90.47	90.47	90.47

* PPA based stations

Commission's Analysis

GSECL has not taken into consideration the fly-ash income in the non-tariff income while arriving at the ARR. As mentioned in the true-up exercise, though the GSECL has been asked to create a separate account for income generated out of fly ash, the Commission decided to consider it as per philosophy adopted in the true-up of FY 2015-16.

The non-tariff income of FY 2015-16 is considered as non-tariff income for each of the years of the control period without any escalation. However, the non-tariff income projected is reduced to the extent of capacity decommissioned. Any variation in the non-tariff income will be taken up during true-up of the respective years. The station-wise approved non-tariff income is provided as below:

Table 6.40: Non-Tariff Income approved for FY 2016-17 to 2020-21

(Rs. Crore)

Sr. No.	Power station	2016-17	2017-18	2018-19	2019-20	2020-21
1	Ukai (1-5)	22.11	22.11	15.87	15.87	11.39
2	Gandhinagar (1-4)	19.64	15.47	12.50	12.50	12.50
3	Wanakbori 1-6 TPS	46.29	46.29	46.29	46.29	46.29
4	Sikka TPS	6.20	6.20	0.00	0.00	0.00
5	KLTPS 1-3	4.84	4.84	4.84	4.84	4.84
6	KLTPS 4	1.65	1.65	1.65	1.65	1.65
7	Dhuvaran CCPP 2	1.81	1.81	1.81	1.81	1.81
8	Ukai Hydro	3.51	3.51	3.51	3.51	3.51
9	Kadana Hydro	3.06	3.06	3.06	3.06	3.06
10	Ukai Extn. 6*	12.71	12.71	12.71	12.71	12.71
11	Gandhinagar 5*	11.93	11.93	11.93	11.93	11.93
12	Wanakbori 7 TPS*	6.75	6.75	6.75	6.75	6.75
13	Dhuvaran CCPP 1*	1.74	1.74	1.74	1.74	1.74



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Sr. No.	Power station	2016-17	2017-18	2018-19	2019-20	2020-21
14	Dhuvaran CCPP 3*	4.32	4.32	4.32	4.32	4.32
15	Utran (Gas)*	1.85	0.00	0.00	0.00	0.00
16	Utran Extension*	5.69	5.69	5.69	5.69	5.69
17	Sikka Extn. (3-4)*	9.60	9.60	9.60	9.60	9.60
18	Wanakbori 8 TPS*	0.00	0.00	0.00	0.00	0.00
19	Dhuvaran STPS*	0.00	0.00	0.00	0.00	0.00
	TOTAL	163.70	157.68	142.26	142.26	137.78

* PPA based stations

The Commission accordingly approves the station-wise Non-Tariff income as detailed in the above Table for the control period for FY 2016-17 to FY 2020-21.



6.4.10 Projected fixed cost

The year-wise/station-wise fixed charges projected by GSECL for the control period from FY 2016-17 to FY 2020-21 are given below:

Table 6.41: Total fixed cost for FY 2016-17

(Rs. Crores)

Sr. No.	Power Station	Depreciation	Interest & Finance Charges	Return on Equity	Interest on Working Capital	O&M Expenses	Tax	SLDC Fees & Charges	Water Charges	Total Fixed Cost	Less: Non-Tariff Income	Net Fixed Charges
1	Ukai (1-5)	85.41	11.22	33.29	38.08	220.09	4.83	0.71	0.14	393.78	13.45	380.33
2	Ukai Extn. 6*	147.63	164.88	128.08	35.47	99.07	2.84	0.40	0.11	578.50	6.48	572.02
3	Gandhinagar (1-4)	57.59	0.30	34.62	35.85	111.05	2.97	0.46	9.59	252.43	9.20	243.24
4	Gandhinagar 5*	13.76	-	26.85	13.25	24.53	1.19	0.06	13.06	92.71	3.42	89.29
5	Wanakbori 1-6 TPS	104.13	4.69	69.13	86.51	236.32	7.17	0.96	39.34	548.25	26.31	521.93
6	Wanakbori 7 TPS*	6.68	-	26.05	12.48	20.98	1.19	0.06	9.00	76.44	2.42	74.02
7	Sikka TPS	46.25	0.82	23.62	18.45	79.92	1.37	0.19	2.51	173.13	5.20	167.93
8	KLTPS 1-3	67.36	0.23	48.23	11.61	106.45	1.22	0.20	0.47	235.78	4.83	230.95
9	KLTPS 4	35.71	23.03	28.87	4.33	18.90	0.43	0.02	0.14	111.43	1.65	109.78
10	Dhuvaran CCPP 1*	18.80	-	11.20	4.86	31.78	0.61	0.06	0.24	67.55	1.74	65.81
11	Dhuvaran CCPP 2	20.19	12.91	17.40	5.24	31.96	0.64	0.06	0.84	89.23	1.81	87.43
12	Dhuvaran CCPP 3*	79.54	103.04	65.71	26.80	68.84	2.14	0.17	-	346.24	4.32	341.92
13	Utran (Gas)*	62.62	-	5.50	8.55	30.51	0.62	0.51	0.05	108.36	1.51	106.86
14	Utran Extension*	66.31	53.06	57.34	25.58	56.16	2.13	0.17	4.01	264.75	5.69	259.06
15	Ukai Hydro	53.34	0.03	10.42	1.28	23.37	1.73	0.19	-	90.37	3.51	86.87
16	Kadana Hydro	17.25	0.04	28.50	1.33	25.97	1.38	0.18	-	74.65	3.06	71.59
17	Sikka Extn. (3-4)*	173.05	214.72	137.53	35.79	99.07	2.84	0.23	1.30	664.55	8.19	656.36
18	Wanakbori 8 TPS*	-	-	-	-	-	-	-	-	-	-	-
19	Dhuvaran STPS*	-	-	-	-	-	-	-	-	-	-	-
	Total	1,055.62	588.96	752.35	365.48	1,284.98	35.32	4.64	80.81	4,168.16	102.79	4,065.38

*PPA based stations



Table 6.42: Total fixed cost for FY 2017-18

(Rs. Crores)

Sr. No.	Power Station	Depreciation	Interest & Finance Charges	Return on Equity	Interest on Working Capital	O&M Expenses	Tax	SLDC Fees & Charges	Water Charges	Total Fixed Cost	Less: Non-Tariff Income	Net Fixed Charges
1	Ukai (1-5)	169.37	20.33	33.62	54.55	232.68	4.83	0.75	0.16	516.29	13.45	502.84
2	Ukai Extn. 6*	147.63	150.09	128.08	36.16	104.72	2.84	0.42	0.13	570.08	6.48	563.60
3	Gandhinagar (1-4)	46.50	0.11	28.17	28.98	94.36	2.39	0.39	8.48	209.38	7.39	201.99
4	Gandhinagar 5*	-	-	26.85	13.51	25.93	1.19	0.06	14.37	81.92	3.42	78.50
5	Wanakbori 1-6 TPS	122.04	12.19	74.38	89.64	249.84	7.17	1.02	43.27	599.55	26.31	573.24
6	Wanakbori 7 TPS*	-	-	26.05	13.13	22.18	1.19	0.06	9.90	72.51	2.42	70.09
7	Sikka TPS	179.74	-	12.06	20.02	84.49	1.37	0.20	2.76	300.64	5.20	295.44
8	KLTPS 1-3	24.77	0.25	48.53	11.48	112.54	1.22	0.21	0.52	199.53	4.83	194.70
9	KLTPS 4	36.03	19.73	29.14	4.51	19.98	0.43	0.02	0.16	110.00	1.65	108.35
10	Dhuvaran CCPP 1*	18.80	-	11.20	5.03	33.60	0.61	0.07	0.26	69.57	1.74	67.82
11	Dhuvaran CCPP 2	20.98	11.90	18.10	5.47	33.78	0.64	0.07	0.92	91.86	1.81	90.05
12	Dhuvaran CCPP 3*	79.54	95.12	65.71	29.24	72.79	2.14	0.18	-	344.72	4.32	340.40
13	Utran (Gas)*	-	-	-	-	-	-	-	-	-	-	-
14	Utran Extension*	66.49	46.91	57.50	26.66	59.37	2.13	0.17	4.41	263.64	5.69	257.94
15	Ukai Hydro	-	-	10.44	0.78	24.71	1.73	0.21	-	37.87	3.51	34.37
16	Kadana Hydro	7.38	0.09	28.58	1.27	27.46	1.38	0.19	-	66.33	3.06	63.27
17	Sikka Extn. (3-4)*	173.05	197.41	137.53	37.30	104.72	2.84	0.25	1.43	654.54	8.19	646.35
18	Wanakbori 8 TPS*	-	-	-	-	-	-	-	-	-	-	-
19	Dhuvaran STPS*	-	-	-	-	-	-	-	-	-	-	-
	Total	1,092.33	554.14	735.94	377.73	1,303.16	34.11	4.27	86.77	4,188.44	99.48	4,088.97

*PPA based station



Table 6.43: Total fixed cost for FY 2018-19

(Rs. Crores)

Sr. No.	Power Station	Depreciation	Interest & Finance Charges	Return on Equity	Interest on Working Capital	O&M Expenses	Tax	SLDC Fees & Charges	Water Charges	Total Fixed Cost	Less: Non-Tariff Income	Net Fixed Charges
1	Ukai (1-5)	73.26	28.18	33.87	39.96	176.54	3.47	0.57	0.13	355.97	9.65	346.32
2	Ukai Extn. 6*	147.63	135.33	128.08	36.93	110.74	2.84	0.45	0.14	562.14	6.48	555.66
3	Gandhinagar (1-4)	46.68	0.11	28.31	29.86	99.75	2.39	0.42	9.32	216.85	7.39	209.46
4	Gandhinagar 5*	-	-	26.85	13.92	27.42	1.19	0.07	15.80	85.25	3.42	81.83
5	Wanakbori 1-6 TPS	138.82	24.27	83.15	92.11	264.13	7.17	1.07	47.60	658.32	26.31	632.00
6	Wanakbori 7 TPS*	-	-	26.05	13.52	23.45	1.19	0.06	10.89	75.16	2.42	72.74
7	Sikka TPS	-	-	-	-	-	-	-	-	-	-	-
8	KLTPS 1-3	25.10	0.21	48.82	11.84	118.98	1.22	0.22	0.57	206.97	4.83	202.14
9	KLTPS 4	36.18	16.17	29.26	4.58	21.12	0.43	0.03	0.18	107.95	1.65	106.30
10	Dhuvaran CCPP 1*	18.80	-	11.20	5.25	35.52	0.61	0.07	0.29	71.74	1.74	70.00
11	Dhuvaran CCPP 2	22.26	11.57	19.23	5.75	35.72	0.64	0.07	1.02	96.25	1.81	94.44
12	Dhuvaran CCPP 3*	79.54	87.23	65.71	30.42	76.95	2.14	0.19	-	342.17	4.32	337.85
13	Utran (Gas)*	-	-	-	-	-	-	-	-	-	-	-
14	Utran Extension*	66.55	40.59	57.55	27.78	62.77	2.13	0.18	4.85	262.40	5.69	256.70
15	Ukai Hydro	-	-	10.44	0.81	26.12	1.73	0.22	-	39.33	3.51	35.82
16	Kadana Hydro	7.46	0.05	28.66	1.30	29.03	1.38	0.20	-	68.08	3.06	65.02
17	Sikka Extn. (3-4)*	173.05	180.13	137.53	37.54	110.74	2.84	0.26	1.58	643.68	8.19	635.49
18	Wanakbori 8 TPS*	117.88	145.12	93.77	46.78	137.43	-	-	-	540.96	-	540.96
19	Dhuvaran STPS*	-	-	-	-	-	-	-	-	-	-	-
	Total	953.21	668.95	828.49	398.34	1,356.40	31.38	4.07	92.36	4,333.22	90.48	4,242.74

*PPA based stations



Table 6.44: Total fixed cost for FY 2019-20

(Rs. Crores)

Sr. No.	Power Station	Depreciation	Interest & Finance Charges	Return on Equity	Interest on Working Capital	O&M Expenses	Tax	SLDC Fees & Charges	Water Charges	Total Fixed Cost	Less: Non-Tariff Income	Net Fixed Charges
1	Ukai (1-5)	83.96	39.67	43.02	39.97	186.63	3.47	0.60	0.14	397.45	9.65	387.80
2	Ukai Extn. 6*	147.63	120.11	128.08	37.72	117.05	2.84	0.47	0.15	554.06	6.48	547.58
3	Gandhinagar (1-4)	46.85	0.11	28.45	30.77	105.46	2.39	0.44	10.26	224.73	7.39	217.34
4	Gandhinagar 5*	-	-	26.85	14.33	28.98	1.19	0.07	17.38	88.82	3.42	85.40
5	Wanakbori 1-6 TPS	144.74	35.67	92.18	85.65	279.24	7.17	1.14	52.36	698.14	26.31	671.83
6	Wanakbori 7 TPS*	-	-	26.05	13.92	24.79	1.19	0.07	11.98	78.00	2.42	75.58
7	Sikka TPS	-	-	-	-	-	-	-	-	-	-	-
8	KLTPS 1-3	25.45	0.22	49.09	12.21	125.79	1.22	0.23	0.63	214.84	4.83	210.01
9	KLTPS 4	36.29	12.48	29.34	4.65	22.33	0.43	0.03	0.19	105.73	1.65	104.09
10	Dhuvaran CCPP 1*	18.80	-	11.20	5.48	37.55	0.61	0.07	0.31	74.04	1.74	72.29
11	Dhuvaran CCPP 2	23.44	10.93	20.28	6.04	37.76	0.64	0.07	1.12	100.29	1.81	98.48
12	Dhuvaran CCPP 3*	79.54	79.03	65.71	31.67	81.35	2.14	0.20	-	339.63	4.32	335.31
13	Utran (Gas)*	-	-	-	-	-	-	-	-	-	-	-
14	Utran Extension*	66.55	34.03	57.55	28.96	66.36	2.13	0.20	5.33	261.10	5.69	255.41
15	Ukai Hydro	-	-	10.44	0.84	27.62	1.73	0.23	-	40.86	3.51	37.36
16	Kadana Hydro	7.57	0.07	28.74	1.34	30.69	1.38	0.21	-	69.98	3.06	66.92
17	Sikka Extn. (3-4)*	173.05	162.25	137.53	38.30	117.05	2.84	0.27	1.74	633.04	8.19	624.85
18	Wanakbori 8 TPS*	235.75	280.47	187.53	55.62	145.25	-	-	-	904.63	-	904.63
19	Dhuvaran STPS*	-	-	-	-	-	-	-	-	-	-	-
	Total	1,089.62	775.05	942.05	407.47	1,433.89	31.38	4.31	101.59	4,785.36	90.48	4,694.88

*PPA based station



Table 6.45: Total fixed cost for FY 2020-21

(Rs. Crores)

Sr. No.	Power Station	Depreciation	Interest & Finance Charges	Return on Equity	Interest on Working Capital	O&M Expenses	Tax	SLDC Fees & Charges	Water Charges	Total Fixed Cost	Less: Non-Tariff Income	Net Fixed Charges
1	Ukai (1-5)	41.76	44.52	48.40	40.47	197.31	3.47	0.64	0.15	376.72	9.65	367.06
2	Ukai Extn. 6*	147.63	105.34	128.08	38.55	123.74	2.84	0.50	0.17	546.86	6.48	540.38
3	Gandhinagar (1-4)	46.92	0.04	28.55	31.71	111.49	2.39	0.47	11.28	232.85	7.39	225.45
4	Gandhinagar 5*	-	-	26.85	14.77	30.64	1.19	0.07	19.12	92.66	3.42	89.23
5	Wanakbori 1-6 TPS	148.54	38.28	96.05	94.07	295.21	7.17	1.20	57.60	738.12	26.31	711.80
6	Wanakbori 7 TPS*	-	-	26.05	14.34	26.20	1.19	0.07	13.18	81.03	2.42	78.61
7	Sikka TPS	-	-	-	-	-	-	-	-	-	-	-
8	KLTPS 1-3	25.71	0.17	49.33	12.60	132.98	1.22	0.25	0.69	222.95	4.83	218.12
9	KLTPS 4	36.44	8.90	29.47	4.72	23.61	0.43	0.03	0.21	103.81	1.65	102.17
10	Dhuvaran CCPP 1*	18.80	-	11.20	5.73	39.70	0.61	0.08	0.35	76.46	1.74	74.72
11	Dhuvaran CCPP 2	25.22	11.03	21.86	6.35	39.92	0.64	0.08	1.23	106.33	1.81	104.52
12	Dhuvaran CCPP 3*	79.54	71.13	65.71	32.98	86.00	2.14	0.21	-	337.71	4.32	333.39
13	Utran (Gas)*	-	-	-	-	-	-	-	-	-	-	-
14	Utran Extension*	66.55	27.62	57.55	30.20	70.15	2.13	0.21	5.87	260.27	5.69	254.58
15	Ukai Hydro	-	-	10.44	0.87	29.20	1.73	0.24	-	42.49	3.51	38.98
16	Kadana Hydro	7.65	0.05	28.81	1.38	32.44	1.38	0.22	-	71.92	3.06	68.86
17	Sikka Extn. (3-4)*	173.05	144.97	137.53	39.10	123.74	2.84	0.29	1.91	623.43	8.19	615.25
18	Wanakbori 8 TPS*	235.75	257.71	187.53	55.56	153.54	-	-	-	890.10	-	890.10
19	Dhuvaran STPS*	272.71	335.74	216.93	96.36	361.28	-	-	-	1,283.02	-	1,283.02
	Total	1,326.28	1,045.52	1,170.34	519.75	1,877.16	31.38	4.55	111.75	6,086.73	90.48	5,996.26

*PPA based stations



6.4.11 Approved Fixed Cost

Based on the Commission's analysis and decisions the approved fixed charges year-wise/station-wise for the control period from FY 2016-17 to FY 2020-21 are summarized in the following five tables:



Table 6.46: GSECL - Approved Fixed Charges for FY 2016-17

(Rs. Crores)

Sr. No.	Power Station	Depreciation	Interest & Finance Charges	Return on Equity	O&M Expenses	Interest on Working Capital	SLDC Charges	Water Charges	Income Tax	Total Fixed Cost	Less Non-Tariff Income	Net Fixed Charges
1	Ukai (1-5)	81.01	22.29	33.00	205.35	37.47	0.60	0.13	4.83	384.68	22.11	362.57
2	Gandhinagar (1-4)	68.97	17.80	28.03	101.98	27.43	0.50	8.67	2.97	256.36	19.64	236.72
3	Wanakbori 1-6 TPS	95.05	18.58	68.73	214.46	62.51	0.81	35.76	7.17	503.08	46.29	456.79
4	Sikka TPS	33.83	1.54	23.55	75.76	13.29	0.16	2.28	1.37	151.78	6.20	145.58
5	KLTPS 1-3	65.47	5.18	48.17	102.72	8.43	0.17	0.43	1.22	231.80	4.84	226.96
6	KLTPS 4	35.70	22.66	28.93	17.60	3.34	0.02	0.13	0.43	108.81	1.65	107.16
7	Dhuvaran CCPP 2	19.88	9.74	14.04	30.00	5.52	0.05	0.76	0.64	80.64	1.81	78.83
8	Ukai Hydro	9.08	3.03	10.41	18.08	0.77	0.17	0.00	1.73	43.26	3.51	39.76
9	Kadana Hydro	15.54	0.17	28.53	21.77	1.23	0.15	0.00	1.38	68.78	3.06	65.72
10	Ukai Extn. 6*	141.13	157.34	122.46	76.84	29.34	0.34	0.10	2.84	530.40	12.71	517.69
11	Gandhinagar 5*	13.75	0.00	30.88	20.89	16.29	0.05	11.87	1.19	94.93	11.93	83.00
12	Wanakbori 7 TPS*	6.68	0.00	28.03	17.33	10.71	0.05	8.18	1.19	72.17	6.75	65.42
13	Dhuvaran CCPP 1*	21.24	0.00	11.07	29.93	4.98	0.05	0.21	0.61	68.10	1.74	66.36
14	Dhuvaran CCPP 3*	76.43	96.59	65.36	62.32	12.83	0.17	0.00	2.14	315.85	4.32	311.53
15	Utran (Gas)*	11.79	1.18	3.47	28.60	4.94	0.53	0.06	0.62	51.19	1.85	49.34
16	Utran Extension*	66.29	58.10	57.39	49.66	18.65	0.14	3.64	2.13	256.00	5.69	250.31
17	Sikka Extn. (3-4)*	172.90	217.49	137.53	85.88	28.33	0.23	1.19	2.84	646.39	9.60	636.79
18	Wanakbori 8 TPS*	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
19	Dhuvaran STPS*	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	Total	934.75	631.70	739.58	1159.18	286.07	4.19	73.44	35.30	3864.22	163.70	3700.52

*PPA based stations



Table 6.47: Approved Fixed Charges for FY 2017-18

(Rs. Crores)

Sr. No.	Power Station	Depreciation	Interest & Finance Charges	Return on Equity	O&M Expenses	Interest on Working Capital	SLDC Charges	Water Charges	Income Tax	Total Fixed Cost	Less Non-Tariff Income	Net Fixed Charges
1	Ukai (1-5)	72.06	24.73	25.70	217.09	41.34	0.60	0.13	4.83	386.49	22.11	364.38
2	Gandhinagar (3-4)	55.81	11.90	17.30	86.65	22.33	0.50	7.01	2.39	203.88	15.47	188.41
3	Wanakbori 1-6 TPS	101.36	17.25	73.98	226.73	67.10	0.81	35.76	7.17	530.16	46.29	483.87
4	Sikka TPS	17.22	0.35	9.74	80.09	13.89	0.16	2.28	1.37	125.11	6.20	118.91
5	KLTPS 1-3	65.83	1.08	48.47	108.60	8.52	0.17	0.43	1.22	234.33	4.84	229.48
6	KLTPS 4	36.03	19.26	29.20	18.60	3.36	0.02	0.13	0.43	107.03	1.65	105.38
7	Dhuvaran CCPP 2	20.67	8.75	14.74	31.72	5.72	0.05	0.76	0.64	83.05	1.81	81.25
8	Ukai Hydro	0.00	2.57	10.42	19.12	0.70	0.17	0.00	1.73	34.71	3.51	31.20
9	Kadana Hydro	15.63	0.00	28.60	23.02	1.26	0.15	0.00	1.38	70.04	3.06	66.98
10	Ukai Extn. 6*	141.13	141.16	122.46	81.22	29.66	0.34	0.10	2.84	518.92	12.71	506.21
11	Gandhinagar 5*	0.00	0.00	30.88	22.08	14.59	0.05	11.87	1.19	80.66	11.93	68.73
12	Wanakbori 7 TPS*	0.00	0.00	28.03	18.33	11.35	0.05	8.18	1.19	67.13	6.75	60.38
13	Dhuvaran CCPP 1*	21.24	0.00	11.07	31.64	5.15	0.05	0.21	0.61	69.98	1.74	68.24
14	Dhuvaran CCPP 3*	76.43	87.63	65.36	65.89	13.10	0.17	0.00	2.14	310.72	4.32	306.40
15	Utran (Gas)*	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
16	Utran Extension*	66.47	50.99	57.55	52.50	19.19	0.14	3.64	2.13	252.61	5.69	246.92
17	Sikka Extn. (3-4)*	172.90	197.24	137.53	90.77	29.25	0.23	1.19	2.84	631.95	9.60	622.35
18	Wanakbori 8 TPS*	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
19	Dhuvaran STPS*	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	Total	862.79	562.91	711.04	1174.06	286.51	3.66	71.71	34.10	3706.78	157.68	3549.09

*PPA based stations



Table 6.48: Approved Fixed Charges for FY 2018-19

(Rs. Crores)

Sr. No.	Power Station	Depreciation	Interest & Finance Charges	Return on Equity	O&M Expenses	Interest on Working Capital	SLDC Charges	Water Charges	Income Tax	Total Fixed Cost	Less Non-Tariff Income	Net Fixed Charges
1	Ukai (3-5)	63.01	28.08	18.32	164.71	30.03	0.6	0.10	3.47	308.31	15.87	292.45
2	Gandhinagar (3-4)	55.98	6.67	17.44	91.61	22.36	0.50	7.01	2.39	203.95	12.50	191.46
3	Wanakbori 1-6 TPS	111.88	20.92	82.76	239.70	66.86	0.81	35.76	7.17	565.87	46.29	519.57
4	Sikka TPS	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
5	KLTPS 1-3	66.18	0.01	48.76	114.81	8.65	0.17	0.43	1.22	240.23	4.84	235.38
6	KLTPS 4	36.18	15.85	29.32	19.67	3.36	0.02	0.13	0.43	104.96	1.65	103.31
7	Dhuvaran CCPP 2	21.95	8.46	15.87	33.54	5.81	0.05	0.76	0.64	87.08	1.81	85.27
8	Ukai Hydro	0.00	2.55	10.42	20.21	0.72	0.17	0.00	1.73	35.81	3.51	32.30
9	Kadana Hydro	15.73	0.00	28.69	24.34	1.29	0.15	0.00	1.38	71.57	3.06	68.51
10	Ukai Extn. 6*	141.13	126.61	122.46	101.05	29.92	0.34	0.10	2.84	524.46	12.71	511.75
11	Gandhinagar 5*	0.00	0.00	30.88	23.34	14.64	0.05	11.87	1.19	81.98	11.93	70.05
12	Wanakbori 7 TPS*	0.00	0.00	28.03	19.37	11.44	0.05	8.18	1.19	68.27	6.75	61.52
13	Dhuvaran CCPP 1*	21.24	0.00	11.07	33.45	5.19	0.05	0.21	0.61	71.83	1.74	70.09
14	Dhuvaran CCPP 3*	76.43	79.65	65.36	69.65	13.10	0.17	0.00	2.14	306.51	4.32	302.19
15	Utran (Gas)*	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
16	Utran Extension*	66.54	44.32	57.60	55.50	19.18	0.14	3.64	2.13	249.05	5.69	243.36
17	Sikka Extn. (3-4)*	172.90	179.22	137.53	101.05	29.30	0.23	1.19	2.84	624.26	9.60	614.65
18	Wanakbori 8 TPS*	117.88	144.37	93.77	137.43	46.77	0.00	0.00	0.00	540.20	0.00	540.20
19	Dhuvaran STPS*	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	Total	967.03	656.70	798.28	1249.44	308.62	3.50	69.39	31.37	4084.33	142.26	3942.07

*PPA based stations



Table 6.49: Approved Fixed Charges for FY 2019-20

(Rs. Crores)

Sr. No.	Power Station	Depreciation	Interest & Finance Charges	Return on Equity	O&M Expenses	Interest on Working Capital	SLDC Charges	Water Charges	Income Tax	Total Fixed Cost	Less Non-Tariff Income	Net Fixed Charges
1	Ukai (3-5)	74.23	35.79	27.47	174.13	29.93	0.6	0.10	3.47	345.72	15.87	329.86
2	Gandhinagar (3-4)	56.15	2.07	17.58	96.85	22.47	0.50	7.01	2.39	205.02	12.50	192.52
3	Wanakbori 1-6 TPS	122.72	23.88	91.78	253.41	67.24	0.81	35.76	7.17	602.78	46.29	556.49
4	Sikka TPS	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
5	KLTPS 1-3	66.50	0.01	49.03	121.38	8.80	0.17	0.43	1.22	247.54	4.84	242.70
6	KLTPS 4	36.28	12.39	29.40	20.79	3.35	0.02	0.13	0.43	102.81	1.65	101.16
7	Dhuvaran CCPP 2	23.14	7.90	16.92	35.45	5.90	0.05	0.76	0.64	90.77	1.81	88.96
8	Ukai Hydro	0.00	2.53	10.42	21.37	0.74	0.17	0.00	1.73	36.96	3.51	33.45
9	Kadana Hydro	15.81	0.00	28.76	25.73	1.32	0.15	0.00	1.38	73.15	3.06	70.09
10	Ukai Extn. 6*	141.13	112.02	122.46	106.80	29.95	0.34	0.10	2.84	515.64	12.71	502.94
11	Gandhinagar 5*	0.00	0.00	30.88	24.68	14.70	0.05	11.87	1.19	83.38	11.93	71.45
12	Wanakbori 7 TPS*	0.00	0.00	28.03	20.48	11.49	0.05	8.18	1.19	69.42	6.75	62.68
13	Dhuvaran CCPP 1*	21.24	0.00	11.07	35.37	5.24	0.05	0.21	0.61	73.79	1.74	72.05
14	Dhuvaran CCPP 3*	76.43	71.64	65.36	73.64	13.12	0.17	0.00	2.14	302.50	4.32	298.18
15	Utran (Gas)*	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
16	Utran Extension*	66.54	37.58	57.60	58.68	19.22	0.14	3.64	2.13	245.52	5.69	239.83
17	Sikka Extn. (3-4)*	172.90	161.10	137.53	106.80	29.29	0.23	1.19	2.84	611.88	9.60	602.27
18	Wanakbori 8 TPS*	235.75	274.82	187.53	145.25	55.68	0.00	0.00	0.00	899.02	0.00	899.02
19	Dhuvaran STPS*	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	Total	1108.83	741.72	911.84	1320.80	318.45	3.50	69.39	31.37	4505.90	142.26	4363.64

*PPA based stations



Table 6.50: Approved Fixed Charges for FY 2020-21

(Rs. Crores)												
Sr. No.	Power Station	Depreciation	Interest & Finance Charges	Return on Equity	O&M Expenses	Interest on Working Capital	SLDC Charges	Water Charges	Income Tax	Total Fixed Cost	Less Non-Tariff Income	Net Fixed Charges
1	Ukai (3-5)	80.83	36.94	32.86	184.09	30.30	0.6	0.10	3.47	369.19	11.39	357.81
2	Gandhinagar (3-4)	56.27	0.08	17.67	102.39	22.52	0.50	7.01	2.39	208.83	12.50	196.34
3	Wanakbori 1-6 TPS	127.36	18.12	95.65	267.91	66.99	0.81	35.76	7.17	619.77	46.29	573.48
4	Sikka TPS	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
5	KLTPS 1-3	66.80	0.01	49.27	128.32	8.94	0.17	0.43	1.22	255.16	4.84	250.31
6	KLTPS 4	36.44	9.13	29.53	21.98	3.35	0.02	0.13	0.43	101.01	1.65	99.36
7	Dhuvaran CCPP 2	24.92	8.11	18.49	37.48	6.00	0.05	0.76	0.64	96.45	1.81	94.65
8	Ukai Hydro	0.00	2.53	10.42	22.59	0.76	0.17	0.00	1.73	38.21	3.51	34.70
9	Kadana Hydro	15.90	0.00	28.84	27.20	1.35	0.15	0.00	1.38	74.81	3.06	71.75
10	Ukai Extn. 6*	141.13	98.59	122.46	112.90	29.88	0.34	0.10	2.84	508.25	12.71	495.55
11	Gandhinagar 5*	0.00	0.00	30.88	26.09	14.70	0.05	11.87	1.19	84.78	11.93	72.85
12	Wanakbori 7 TPS*	0.00	0.00	28.03	21.65	11.49	0.05	8.18	1.19	70.59	6.75	63.84
13	Dhuvaran CCPP 1*	21.24	0.00	11.07	37.39	5.27	0.05	0.21	0.61	75.84	1.74	74.10
14	Dhuvaran CCPP 3*	76.43	64.37	65.36	77.85	13.11	0.17	0.00	2.14	299.43	4.32	295.11
15	Utran (Gas)*	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
16	Utran Extension*	66.54	31.25	57.60	62.03	19.18	0.14	3.64	2.13	242.51	5.69	236.82
17	Sikka Extn. (3-4)*	172.90	144.66	137.53	112.90	29.20	0.23	1.19	2.84	601.44	9.60	591.84
18	Wanakbori 8 TPS*	235.75	252.40	187.53	153.54	55.51	0.00	0.00	0.00	884.73	0.00	884.73
19	Dhuvaran STPS*	272.71	330.87	216.93	361.28	96.31	0.00	0.00	0.00	1278.10	0.00	1278.10
	Total	1395.21	997.07	1140.13	1757.60	414.85	3.50	69.39	31.37	5809.12	137.78	5671.34

*PPA based stations

The fixed charges projected by GSECL and approved by the Commission for the control period for FY 2016-17 to FY 2020-21 are summarized in the Table below:



Table 6.51: Component wise Fixed Cost Projected and Approved for the MYT Period FY 2016-17 to 2020-21

(Rs. Crore)

Sr. No.	Fixed Charges	Projected					Approved				
		2016-17	2017-18	2018-19	2019-20	2020-21	2016-17	2017-18	2018-19	2019-20	2020-21
1	2	3	4	5	6	7	8	9	10	11	12
1	Depreciation	1055.62	1092.33	953.21	1089.62	1326.28	934.75	862.79	967.03	1108.83	1395.21
2	Interest & Fin charges	588.96	554.14	668.95	775.05	1045.52	631.70	562.91	656.70	741.72	997.07
3	Return on equity	752.35	735.94	828.49	942.05	1170.34	739.58	711.04	798.28	911.84	1140.13
4	Interest on working capital	365.30	377.58	398.18	407.30	519.57	286.07	286.51	308.62	318.45	414.85
5	O&M expenses	1275.92	1295.45	1348.26	1425.28	1868.06	1159.18	1174.06	1249.44	1320.80	1757.60
6	Water charges	80.81	86.77	92.36	101.59	111.75	73.44	71.71	69.39	69.39	69.39
7	Income Tax	35.32	34.11	31.38	31.38	31.38	35.30	34.10	31.37	31.37	31.37
8	SLDC charges	4.64	4.27	4.07	4.31	4.55	4.19	3.66	3.50	3.50	3.50
9	Fixed Cost	4158.92	4180.59	4324.91	4776.58	6077.45	3864.22	3706.78	4084.33	4505.90	5809.12
10	Less: Other Income	102.79	99.48	90.48	90.48	90.48	163.70	157.68	142.26	142.26	137.78
11	Total Fixed Cost	4056.13	4081.11	4234.43	4686.10	5986.98	3700.52	3549.09	3942.07	4363.64	5671.34



The Energy Charges Station-wise projected by GSECL and approved by the Commission for the Control Period FY 2016-17 to FY 2020-21 are summarized in the Table below:

Table 6.52: Net Energy Charges projected and approved for the MYT Period FY 2016-17 to 2020-21

(Rs./kWh)

Sr. No.	Power Station	Projected					Approved				
		2016-17	2017-18	2018-19	2019-20	2020-21	2016-17	2017-18	2018-19	2019-20	2020-21
1	Ukai (1-5)	3.44	3.50	3.60	3.66	3.70	2.899	2.862	2.862	2.821	2.768
2	Gandhinagar (1-4)	3.75	3.87	3.99	4.11	4.23	3.401	3.308	3.308	3.308	3.308
3	Wanakbori 1-6 TPS	3.74	3.86	3.94	4.06	4.10	3.269	3.269	3.269	3.269	3.238
4	Sikka TPS	4.27	4.32	0.00	0.00	0.00	3.876	3.870	0.000	0.000	0.000
5	KLTPS 1-3	2.81	2.89	2.97	3.07	3.16	1.496	1.496	1.496	1.496	1.496
6	KLTPS 4	2.87	2.81	2.90	2.98	3.08	1.469	1.469	1.469	1.469	1.469
7	Dhuvaran CCPP 2	2.50	2.62	2.75	2.89	3.03	4.066	4.066	4.066	4.066	4.066
8	Ukai Hydro	0.00	0.00	0.00	0.00	0.00	0.000	0.000	0.000	0.000	0.000
9	Kadana Hydro	0.00	0.00	0.00	0.00	0.00	0.000	0.000	0.000	0.000	0.000
10	Ukai Extn. 6*	2.99	3.08	3.17	3.27	3.36	2.516	2.516	2.516	2.516	2.516
11	Gandhinagar 5*	3.52	3.63	3.74	3.85	3.97	4.540	3.912	3.912	3.912	3.912
12	Wanakbori 7 TPS*	3.47	3.55	3.66	3.77	3.89	3.093	3.093	3.093	3.093	3.093
13	Dhuvaran CCPP 1*	2.57	2.67	2.80	2.94	3.09	3.899	3.899	3.899	3.899	3.899
14	Dhuvaran CCPP 3*	4.22	4.43	4.65	4.89	5.13	2.256	2.256	2.256	2.256	2.256
15	Utran (Gas)*	4.81	0.00	0.00	0.00	0.00	4.766	0.000	0.000	0.000	0.000
16	Utran Extension*	4.24	4.46	4.68	4.91	5.16	4.345	4.345	4.345	4.345	4.345
17	Sikka Extn. (3-4)*	3.19	3.20	3.23	3.33	3.43	2.425	2.425	2.425	2.425	2.425
18	Wanakbori 8 TPS*	0.00	0.00	2.94	2.94	2.94	0.000	0.000	2.941	2.941	2.941
19	Dhuvaran STPS*	0.00	0.00	0.00	0.00	2.94	0.000	0.000	0.000	0.000	2.941

* PPA based stations



The fixed charges station-wise projected by GSECL and approved by the Commission for the control period FY 2016-17 to 2020-21 are summarized in the Table below:

Table 6.53: Station-wise Fixed Cost Projected and Approved for the MYT Period FY 2016-17 to FY 2020-21

(Rs. Crore)

Sr. No.	Power Station	Projected					Approved				
		2016-17	2017-18	2018-19	2019-20	2020-21	2016-17	2017-18	2018-19	2019-20	2020-21
1	Ukai (1-5)	380.33	502.84	346.32	387.80	367.06	362.57	364.38	292.45	329.86	357.81
2	Gandhinagar (1-4)	243.24	201.99	209.46	217.34	225.45	236.72	188.41	191.46	192.52	196.34
3	Wanakbori 1-6 TPS	521.93	573.24	632.00	671.83	711.80	456.79	483.87	519.57	556.49	573.48
4	Sikka TPS	167.93	295.44	-	-	-	145.58	118.91	0.00	0.00	0.00
5	KLTPS 1-3	230.95	194.70	202.14	210.01	218.12	226.96	229.48	235.38	242.70	250.31
6	KLTPS 4	109.78	108.35	106.30	104.09	102.17	107.16	105.38	103.31	101.16	99.36
7	Dhuvaran CCPP 2	87.43	90.05	94.44	98.48	104.52	78.83	81.25	85.27	88.96	94.65
8	Ukai Hydro	86.87	34.37	35.82	37.36	38.98	39.76	31.20	32.30	33.45	34.70
9	Kadana Hydro	71.59	63.27	65.02	66.92	68.86	65.72	66.98	68.51	70.09	71.75
10	Ukai Extn. 6*	572.02	563.60	555.66	547.58	540.38	517.69	506.21	511.75	502.94	495.55
11	Gandhinagar 5*	89.29	78.50	81.83	85.40	89.23	83.00	68.73	70.05	71.45	72.85
12	Wanakbori 7 TPS*	74.02	70.09	72.74	75.58	78.61	65.42	60.38	61.52	62.68	63.84
13	Dhuvaran CCPP 1*	65.81	67.82	70.00	72.29	74.72	66.36	68.24	70.09	72.05	74.10
14	Dhuvaran CCPP 3*	341.92	340.40	337.85	335.31	333.39	311.53	306.40	302.19	298.18	295.11
15	Utran (Gas)*	106.86	-	-	-	-	49.34	0.00	0.00	0.00	0.00
16	Utran Extension*	259.06	257.94	256.70	255.41	254.58	250.31	246.92	243.36	239.83	236.82
17	Sikka Extn. (3-4)*	656.36	646.35	635.49	624.85	615.25	636.79	622.35	614.65	602.27	591.84
18	Wanakbori 8 TPS*	-	-	540.96	904.63	890.10	0.00	0.00	540.20	899.02	884.73
19	Dhuvaran STPS*	-	-	-	-	1283.02	0.00	0.00	0.00	0.00	1278.10
	Total	4065.38	4088.97	4242.74	4694.88	5996.26	3700.52	3549.09	3942.07	4363.64	5671.34

* PPA based stations



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Annexure: 6.1: Control period 2016-17 to 2020-21
Fuel costs (Coal, Lignite & Secondary Oil) - Ukai TPS 1 to 5

Ukai 1-5	Derivation	Unit	2016-17	2017-18	2018-19	2019-20	2020-21
Gross Generation	A	MUs	2904	4468	3206	3001	3099
Auxiliary Consumption	C	%	9.00%	9.00%	9.00%	9.00%	9.00%
Auxiliary Consumption	B	MUs	261	402	289	270	279
Net Generation	Y=A-B	MUs	2642.59	4066	2918	2730.56	2820
Station Heat Rate	D	Kcal/kWh	2750	2715	2715	2675	2625
Sp. Oil Consumption	E	ml/kWh	1	1	1	1	1
Gross calorific value of coal	F	Kcal/Kg	3835	3835	3835	3835	3835
Calorific value of oil	G	Kcal/l	10441	10441	10441	10441	10441
Overall Heat	H= A x D	Gcal	7985835	12129534	8704724	8026644	8135631
Heat from Oil	I= (A x E x G)/1000	Gcal	30319	46645	33475	31329	32359
Heat from Coal	J = H-I	Gcal	7955516	12082889	8671250	7995315	8103272
Transit losses	K	%	0.80%	0.80%	0.80%	0.80%	0.80%
Coal Blend							
(A) Indigenous coal	X1	%	22%	22%	22%	22%	22%
(B) Washed Coal	X2	%	78%	78%	78%	78%	78%
(c) Imported Coal	X3	%	0%	0%	0%	0%	0%
Actual oil consumption	L= A x E	Kl	2904	4468	3206	3001	3099
Actual Coal consumption	M= (J x 1000)/F	MT	2074607	3150927	2261254	2084986	2113139
(A) Indigenous coal	Q1=M* x X1/(1-K)	MT	460094	698794	501488	462396	468640
(B) Washed Coal	Q2=M* x X2 / (1-K)	MT	1631244	2477543	1778002	1639404	1661540
(c) Imported Coal	Q3=M* X X3	MT	0	0	0	0	0
Price of coal							
(A) Indigenous coal	P1	Rs./MT	3396	3396	3396	3396	3396
(B) Washed Coal	P2	Rs./MT	3679	3679	3679	3679	3679
(c) Imported Coal	P3	Rs./MT	6227	6227	6227	6227	6227
Price of oil	P4	Rs./Kl	33170	33170	33170	33170	33170
Coal Cost							
(A) Indigenous coal	N1=Q1 X P1	Rs.Lakh	15625	23731	17030	15703	15915
(B) Washed Coal	N2=Q2 X P2	Rs.Lakh	60021	91161	65421	60322	61136
(c) Imported Coal	N3=Q3 X P3	Rs.Lakh	0	0	0	0	0
Total coal cost	N4= N1+N2+N3	Rs.Lakh	75646	114892	82452	76025	77051
Oil Cost	N5=P4 x L/10^5	Rs.Lakh	963	1482	1063	995	1028
Total fuel cost	O= N4+N5	Rs.Lakh	76609	116374	83515	77020	78079
Fuel cost/Unit (Gross)	P= O/(A*10)	Rs/kWh	2.64	2.60	2.60	2.57	2.52
Fuel cost/Unit (Net)	Q=O/(Y*10)	Rs/kWh	2.90	2.86	2.86	2.82	2.77
Cost of fuel/G.Cal	R=(O/H)*10^5	Rs./Gcal	959	959	959	960	960



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Annexure: 6.2: Control period 2016-17 to 2020-21
Fuel costs (Coal, Lignite & Secondary Oil) - Gandhinagar 1-4

Item	Derivation	Unit	2016-17	2017-18	2018-19	2019-20	2020-21
Gross Generation	A	MUs	1731	1656	1656	1660	1656
Auxiliary Consumption	C	%	9.50%	9.00%	9.00%	9.00%	9.00%
Auxiliary Consumption	B	MUs	164	149	149	149	149
Net Generation	Y=A-B	MUs	1566.53	1507	1507	1511	1507
Station Heat Rate	D	Kcal/kWh	2650	2625	2625	2625	2625
Sp. Oil Consumption	E	ml/kWh	1	1	1	1	1
Gross calorific value of coal	F	Kcal/Kg	3937	3918	3918	3918	3918
Calorific value of oil	G	Kcal/l	10368	10368	10368	10368	10368
Overall Heat	H= A x D	Gcal	4587086	4346055	4346055	4357962	4346055
Heat from Oil	I= (A x E x G)/1000	Gcal	22433	17165	17165	17212	17165
Heat from Coal	J = H-I	Gcal	4564654	4328890	4328890	4340750	4328890
Transit losses	K	%	0.80%	0.80%	0.80%	0.80%	0.80%
Coal Blend							
(A) Indigenous coal	X1	%	0.0%	0.0%	0.0%	0.0%	0.0%
(B) Washed Coal	X2	%	97.0%	100.0%	100.0%	100.0%	100.0%
(c) Imported Coal	X3	%	3.0%	0.0%	0.0%	0.0%	0.0%
Actual oil consumption	L= A x E	Kl	2164	1656	1656	1660	1656
Actual Coal consumption	M= (J x 1000)/F	MT	1159513	1104809	1104809	1107836	1104809
(A) Indigenous coal	Q1=M* x X1/(1-K)	MT	0	0	0	0	0
(B) Washed Coal	Q2=M* x X2 / (1-K)	MT	1133737	1113719	1113719	1116771	1113719
(c) Imported Coal	Q3=M* X X3	MT	35127	0	0	0	0
Price of coal							
(A) Indigenous coal	P1	Rs./MT	4932	4932	4932	4932	4932
(B) Washed Coal	P2	Rs./MT	4428	4428	4428	4428	4428
(c) Imported Coal	P3	Rs./MT	6817	6817	6817	6817	6817
Price of oil	P4	Rs./Kl	31793	31793	31793	31793	31793
Coal Cost							
(A) Indigenous coal	N1=Q1 X P1	Rs.Lakh	0	0	0	0	0
(B) Washed Coal	N2=Q2 X P2	Rs.Lakh	50200	49314	49314	49449	49314
(c) Imported Coal	N3=Q3 X P3	Rs.Lakh	2395	0	0	0	0
Total coal cost	N4= N1+N2+N3	Rs.Lakh	52595	49314	49314	49449	49314
Oil Cost	N5=P4 x L/10^5	Rs.Lakh	688	526	526	528	526
Total fuel cost	O= N4+N5	Rs.Lakh	53282	49840	49840	49976	49840
Fuel cost/Unit (Gross)	P= O/(A*10)	Rs/kWh	3.08	3.01	3.01	3.01	3.01
Fuel cost/Unit (Net)	Q=O/(Y*10)	Rs/kWh	3.40	3.31	3.31	3.31	3.31
Cost of fuel/G.Cal	R=(O/H)*10^5	Rs./Gcal	1162	1147	1147	1147	1147



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Annexure: 6.3: Control period 2016-17 to 2020-21
Fuel costs (Coal, Lignite & Secondary Oil) - Gandhinagar 5

Item	Derivation	Unit	2016-17	2017-18	2018-19	2019-20	2020-21
Gross Generation	A	MUs	1288	1416	1416	1420	1416
Auxiliary Consumption	C	%	9.50%	9.50%	9.50%	9.50%	9.50%
Auxiliary Consumption	B	MUs	122	135	135	135	135
Net Generation	Y=A-B	MUs	1165.39	1282	1282	1285	1282
Station Heat Rate	D	Kcal/kWh	2460	2460	2460	2460	2460
Sp. Oil Consumption	E	ml/kWh	4	4	4	4	4
Gross calorific value of coal	F	Kcal/Kg	3943	3934	3934	3934	3934
Calorific value of oil	G	Kcal/l	10440	10440	10440	10440	10440
Overall Heat	H= A x D	Gcal	3167791	3484570	3484570	3494117	3484570
Heat from Oil	I= (A x E x G)/1000	Gcal	47053	51759	51759	51900	51759
Heat from Coal	J = H-I	Gcal	3120738	3432812	3432812	3442217	3432812
Transit losses	K	%	0.00%	0.00%	0.00%	0.00%	0.00%
Coal Blend							
(A) Indigenous coal	X1	%	0.0%	0.0%	0.0%	0.0%	0.0%
(B) Washed Coal	X2	%	98.5%	100.0%	100.0%	100.0%	100.0%
(c) Imported Coal	X3	%	1.5%	0.0%	0.0%	0.0%	0.0%
Actual oil consumption	L= A x E	Kl	4507	4958	4958	4971	4958
Actual Coal consumption	M= (J x 1000)/F	MT	791499	872710	872710	875101	872710
(A) Indigenous coal	Q1=M* x X1/(1-K)	MT	0	0	0	0	0
(B) Washed Coal	Q2=M* x X2 / (1-K)	MT	1151379	1113719	1113719	1116771	1113719
(c) Imported Coal	Q3=M* X X3	MT	17485	0	0	0	0
Price of coal							
(A) Indigenous coal	P1	Rs./MT	4824	4824	4824	4824	4824
(B) Washed Coal	P2	Rs./MT	4360	4360	4360	4360	4360
(c) Imported Coal	P3	Rs./MT	7187	7187	7187	7187	7187
Price of oil	P4	Rs./Kl	32221	32221	32221	32221	32221
Coal Cost							
(A) Indigenous coal	N1=Q1 X P1	Rs.Lakh	0	0	0	0	0
(B) Washed Coal	N2=Q2 X P2	Rs.Lakh	50199	48557	48557	48690	48557
(c) Imported Coal	N3=Q3 X P3	Rs.Lakh	1257	0	0	0	0
Total coal cost	N4= N1+N2+N3	Rs.Lakh	51455	48557	48557	48690	48557
Oil Cost	N5=P4 x L/10^5	Rs.Lakh	1452	1597	1597	1602	1597
Total fuel cost	O= N4+N5	Rs.Lakh	52908	50154	50154	50292	50154
Fuel cost/Unit (Gross)	P= O/(A*10)	Rs/kWh	4.11	3.54	3.54	3.54	3.54
Fuel cost/Unit (Net)	Q=O/(Y*10)	Rs/kWh	4.54	3.91	3.91	3.91	3.91
Cost of fuel/G.Cal	R=(O/H)*10^5	Rs./Gcal	1670	1439	1439	1439	1439



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Annexure: 6.4: Control period 2016-17 to 2020-21
Fuel costs (Coal, Lignite & Secondary Oil) - Wanakbori 1-6

Item	Derivation	Unit	2016-17	2017-18	2018-19	2019-20	2020-21
Gross Generation	A	MUs	4636	6071	5740	5534	5519
Auxiliary Consumption	C	%	9.00%	9.00%	9.00%	9.00%	9.00%
Auxiliary Consumption	B	MUs	417	546	517	498	497
Net Generation	Y=A-B	MUs	4218.57	5524	5223	5036	5022
Station Heat Rate	D	Kcal/kWh	2625	2625	2625	2625	2600
Sp. Oil Consumption	E	ml/kWh	1	1	1	1	1
Gross calorific value of coal	F	Kcal/Kg	3880	3880	3880	3880	3880
Calorific value of oil	G	Kcal/l	10327	10327	10327	10327	10327
Overall Heat	H= A x D	Gcal	12168954	15935535	15066324	14526540	14348880
Heat from Oil	I= (A x E x G)/1000	Gcal	47872	62689	59270	57146	56990
Heat from Coal	J = H-I	Gcal	12121082	15872846	15007054	14469394	14291890
Transit losses	K	%	0.80%	0.80%	0.80%	0.80%	0.80%
Coal Blend							
(A) Indigenous coal	X1	%	0.0%	0.0%	0.0%	0.0%	0.0%
(B) Washed Coal	X2	%	100.0%	100.0%	100.0%	100.0%	100.0%
(c) Imported Coal	X3	%	0.0%	0.0%	0.0%	0.0%	0.0%
Actual oil consumption	L= A x E	Kl	4636	6071	5740	5534	5519
Actual Coal consumption	M= (J x 1000)/F	MT	3124080	4091057	3867908	3729332	3683582
(A) Indigenous coal	Q1=M* x X1/(1-K)	MT	0	0	0	0	0
(B) Washed Coal	Q2=M* x X2 / (1-K)	MT	3149274	4124049	3899101	3759407	3713288
(c) Imported Coal	Q3=M* X X3	MT	0	0	0	0	0
Price of coal							
(A) Indigenous coal	P1	Rs./MT	5368	5368	5368	5368	5368
(B) Washed Coal	P2	Rs./MT	4334	4334	4334	4334	4334
(c) Imported Coal	P3	Rs./MT	6750	6750	6750	6750	6750
Price of oil	P4	Rs./Kl	31022	31022	31022	31022	31022
Coal Cost							
(A) Indigenous coal	N1=Q1 X P1	Rs.Lakh	0	0	0	0	0
(B) Washed Coal	N2=Q2 X P2	Rs.Lakh	136475	178718	168969	162916	160917
(c) Imported Coal	N3=Q3 X P3	Rs.Lakh	0	0	0	0	0
Total coal cost	N4= N1+N2+N3	Rs.Lakh	136475	178718	168969	162916	160917
Oil Cost	N5=P4 x L/10^5	Rs.Lakh	1438	1883	1780	1717	1712
Total fuel cost	O= N4+N5	Rs.Lakh	137913	180601	170750	164632	162629
Fuel cost/Unit (Gross)	P= O/(A*10)	Rs/kWh	2.97	2.97	2.97	2.97	2.95
Fuel cost/Unit (Net)	Q=O/(Y*10)	Rs/kWh	3.27	3.27	3.27	3.27	3.24
Cost of fuel/G.Cal	R=(O/H)*10^5	Rs./Gcal	1133	1133	1133	1133	1133



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Annexure 6.5: Control period 2016-17 to 2020-21
Fuel costs (Coal, Lignite & Secondary Oil) - Wanakbori 7

Item	Derivation	Unit	2016-17	2017-18	2018-19	2019-20	2020-21
Gross Generation	A	MUs	1012	1288	1288	1291	1288
Auxiliary Consumption	C	%	9.50%	9.50%	9.50%	9.50%	9.50%
Auxiliary Consumption	B	MUs	96	122	122	123	122
Net Generation	Y=A-B	MUs	915.66	1165	1165	1169	1165
Station Heat Rate	D	Kcal/kWh	2460	2460	2460	2460	2460
Sp. Oil Consumption	E	ml/kWh	4	4	4	4	4
Gross calorific value of coal	F	Kcal/Kg	3957	3957	3957	3957	3957
Calorific value of oil	G	Kcal/l	10293	10293	10293	10293	10293
Overall Heat	H= A x D	Gcal	2488979	3167791	3167791	3176470	3167791
Heat from Oil	I= (A x E x G)/1000	Gcal	36450	46391	46391	46518	46391
Heat from Coal	J = H-I	Gcal	2452529	3121400	3121400	3129952	3121400
Transit losses	K	%	0.80%	0.80%	0.80%	0.80%	0.80%
Coal Blend							
(A) Indigenous coal	X1	%	0.0%	0.0%	0.0%	0.0%	0.0%
(B) Washed Coal	X2	%	100.0%	100.0%	100.0%	100.0%	100.0%
(c) Imported Coal	X3	%	0.0%	0.0%	0.0%	0.0%	0.0%
Actual oil consumption	L= A x E	Kl	3541	4507	4507	4519	4507
Actual Coal consumption	M= (J x 1000)/F	MT	619790	788824	788824	790985	788824
(A) Indigenous coal	Q1=M* x X1/(1-K)	MT	0	0	0	0	0
(B) Washed Coal	Q2=M* x X2 / (1-K)	MT	624788	795185	795185	797364	795185
(c) Imported Coal	Q3=M* X X3	MT	0	0	0	0	0
Price of coal							
(A) Indigenous coal	P1	Rs./MT	5422	5422	5422	5422	5422
(B) Washed Coal	P2	Rs./MT	4355	4355	4355	4355	4355
(c) Imported Coal	P3	Rs./MT	6819	6819	6819	6819	6819
Price of oil	P4	Rs./Kl	31536	31536	31536	31536	31536
Coal Cost							
(A) Indigenous coal	N1=Q1 X P1	Rs.Lakh	0	0	0	0	0
(B) Washed Coal	N2=Q2 X P2	Rs.Lakh	27208	34628	34628	34723	34628
(c) Imported Coal	N3=Q3 X P3	Rs.Lakh	0	0	0	0	0
Total coal cost	N4= N1+N2+N3	Rs.Lakh	27208	34628	34628	34723	34628
Oil Cost	N5=P4 x L/10^5	Rs.Lakh	1117	1421	1421	1425	1421
Total fuel cost	O= N4+N5	Rs.Lakh	28324	36049	36049	36148	36049
Fuel cost/Unit (Gross)	P= O/(A*10)	Rs/kWh	2.80	2.80	2.80	2.80	2.80
Fuel cost/Unit (Net)	Q=O/(Y*10)	Rs/kWh	3.09	3.09	3.09	3.09	3.09
Cost of fuel/G.Cal	R=(O/H)*10^5	Rs./Gcal	1138	1138	1138	1138	1138



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Annexure 6.6: Control period 2016-17 to 2020-21
Fuel costs (Coal, Lignite & Secondary Oil) - Sikka TPS

Item	Derivation	Unit	2016-17	2017-18	2018-19	2019-20	2020-21
Gross Generation	A	MUs	568	841	0	0	0
Auxiliary Consumption	C	%	11.00%	11.00%	0.00%	0.00%	0.00%
Auxiliary Consumption	B	MUs	62	93	0	0	0
Net Generation	Y=A-B	MUs	505.21	748	0	0	0
Station Heat Rate	D	Kcal/kWh	3008	3003	0	0	0
Sp. Oil Consumption	E	ml/kWh	3	3	0	0	0
Gross calorific value of coal	F	Kcal/Kg	4272	4272	4272	4272	4272
Calorific value of oil	G	Kcal/l	10378	10378	10378	10378	10378
Overall Heat	H= A x D	Gcal	1707485	2525403	0	0	0
Heat from Oil	I= (A x E x G)/1000	Gcal	17674	26183	0	0	0
Heat from Coal	J = H-I	Gcal	1689811	2499220	0	0	0
Transit losses	K	%	0.80%	0.80%	0.00%	0.00%	0.00%
Coal Blend							
(A) Indigenous coal	X1	%	0.0%	0.0%	0.0%	0.0%	0.0%
(B) Washed Coal	X2	%	100.0%	100.0%	100.0%	100.0%	100.0%
(c) Imported Coal	X3	%	0.0%	0.0%	0.0%	0.0%	0.0%
Actual oil consumption	L= A x E	Kl	1703	2523	0	0	0
Actual Coal consumption	M= (J x 1000)/F	MT	395527	584981	0	0	0
(A) Indigenous coal	Q1=M* x X1/(1-K)	MT	0	0	0	0	0
(B) Washed Coal	Q2=M* x X2 / (1-K)	MT	398716	589699	0	0	0
(c) Imported Coal	Q3=M* X X3	MT	0	0	0	0	0
Price of coal							
(A) Indigenous coal	P1	Rs./MT	0	0	0	0	0
(B) Washed Coal	P2	Rs./MT	4763	4763	4763	4763	4763
(c) Imported Coal	P3	Rs./MT	3409	3409	3409	3409	3409
Price of oil	P4	Rs./Kl	34658	34658	34658	34658	34658
Coal Cost							
(A) Indigenous coal	N1=Q1 X P1	Rs.Lakh	0	0	0	0	0
(B) Washed Coal	N2=Q2 X P2	Rs.Lakh	18991	28088	0	0	0
(c) Imported Coal	N3=Q3 X P3	Rs.Lakh	0	0	0	0	0
Total coal cost	N4= N1+N2+N3	Rs.Lakh	18991	28088	0	0	0
Oil Cost	N5=P4 x L/10^5	Rs.Lakh	590	874	0	0	0
Total fuel cost	O= N4+N5	Rs.Lakh	19581	28962	0	0	0
Fuel cost/Unit (Gross)	P= O/(A*10)	Rs/kWh	3.45	3.44	0	0	0
Fuel cost/Unit (Net)	Q=O/(Y*10)	Rs/kWh	3.88	3.87	0	0	0
Cost of fuel/G.Cal	R=(O/H)*10^5	Rs./Gcal	1147	1147	0	0	0



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Annexure: 6.7: Control period 2016-17 to 2020-21
Fuel costs (Coal, Lignite & Secondary Oil) - KLTPS 1-3

Item	Derivation	Unit	2016-17	2017-18	2018-19	2019-20	2020-21
Gross Generation	A	MUs	1413	1413	1413	1416	1413
Auxiliary Consumption	C	%	12.00%	12.00%	12.00%	12.00%	12.00%
Auxiliary Consumption	B	MUs	170	170	170	170	170
Net Generation	Y=A-B	MUs	1243.04	1243	1243	1246	1243
Station Heat Rate	D	Kcal/kWh	3231	3231	3231	3231	3231
Sp. Oil Consumption	E	ml/kWh	3	3	3	3	3
Gross calorific value of coal	F	Kcal/Kg	2786	2786	2786	2786	2786
Calorific value of oil	G	Kcal/l	10285	10285	10285	10285	10285
Overall Heat	H= A x D	Gcal	4563949	4563949	4563949	4576453	4563949
Heat from Oil	I= (A x E x G)/1000	Gcal	43586	43586	43586	43706	43586
Heat from Coal	J = H-I	Gcal	4520363	4520363	4520363	4532747	4520363
Transit losses	K	%	0.20%	0.20%	0.20%	0.20%	0.20%
Actual oil consumption	L= A x E	Kl	4238	4238	4238	4249	4238
Actual Coal consumption	M= (J x 1000)/F	MT	1622528	1622528	1622528	1626973	1622528
Coal consumption incl. transit losses	N=M/(1-K)	MT	1625779	1625779	1625779	1630234	1625779
Price of lignite	P1	Rs./MT	1072	1072	1072	1072	1072
Price of oil	P2	Rs./Kl	28419	28419	28419	28419	28419
Cost of lignite	N1= M x P1	Rs. Lakh	17396	17396	17396	17443	17396
Oil cost	N2=P2 x L/10 ⁵	Rs. Lakh	1204	1204	1204	1208	1204
Total fuel cost	O= N1 + N2	Rs. Lakh	18600	18600	18600	18651	18600
Fuel cost/Unit (Gross)	P=O/(A*10)	Rs/kWh	1.32	1.32	1.32	1.32	1.32
Fuel cost/Unit (Net)	Q=O/(Y*10)	Rs/kWh	1.50	1.50	1.50	1.50	1.50
Cost of fuel/Gcal	R=(O/H)*10 ⁵	Rs./Gcal	408	408	408	408	408



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Annexure 6.8: Control period 2016-17 to 2020-21
Fuel costs (Coal, Lignite & Secondary Oil) - KLTPS 4

Item	Derivation	Unit	2016-17	2017-18	2018-19	2019-20	2020-21
Gross Generation	A	MUs	473	493	493	494	493
Auxiliary Consumption	C	%	12.00%	12.00%	12.00%	12.00%	12.00%
Auxiliary Consumption	B	MUs	57	59	59	59	59
Net Generation	$Y=A-B$	MUs	416.28	434	434	435	434
Station Heat Rate	D	Kcal/kWh	3000	3000	3000	3000	3000
Sp. Oil Consumption	E	ml/kWh	3	3	3	3	3
Gross calorific value of coal	F	Kcal/Kg	2786	2786	2786	2786	2786
Calorific value of oil	G	Kcal/l	10285	10285	10285	10285	10285
Overall Heat	$H= A \times D$	Gcal	1419120	1478250	1478250	1482300	1478250
Heat from Oil	$I= (A \times E \times G)/1000$	Gcal	14596	15204	15204	15246	15204
Heat from Coal	$J = H-I$	Gcal	1404524	1463046	1463046	1467054	1463046
Transit losses	K	%	0.20%	0.20%	0.20%	0.20%	0.20%
Actual oil consumption	$L= A \times E$	Kl	1419	1478	1478	1482	1478
Actual Coal consumption	$M= (J \times 1000)/F$	MT	504136	525142	525142	526581	525142
Coal consumption incl. transit losses	$N=M/(1-K)$	MT	505147	526194	526194	527636	526194
Price of lignite	P1	Rs./MT	1088	1088	1088	1088	1088
Price of oil	P2	Rs./Kl	44459	44459	44459	44459	44459
Cost of lignite	$N1= M \times P1$	Rs. Lakh	5484	5712	5712	5728	5712
Oil cost	$N2=P2 \times L/10^5$	Rs. Lakh	631	657	657	659	657
Total fuel cost	$O= N1 + N2$	Rs. Lakh	6115	6369	6369	6387	6369
Fuel cost/Unit (Gross)	$P=O/(A \times 10)$	Rs/kWh	1.29	1.29	1.29	1.29	1.29
Fuel cost/Unit (Net)	$Q=O/(Y \times 10)$	Rs/kWh	1.47	1.47	1.47	1.47	1.47
Cost of fuel/Gcal	$R=(O/H) \times 10^5$	Rs./Gcal	431	431	431	431	431



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Annexure 6.9: Control period 2016-17 to 2020-21
Fuel costs (Gas) - Dhuvaran Gas 1

Item	Derivation	Unit	2016-17	2017-18	2018-19	2019-20	2020-21
Gross Generation	A	MUs	196	233	233	234	233
Auxiliary Consumption	C	%	4.00%	4.00%	4.00%	4.00%	4.00%
Auxiliary Consumption	B	MUs	8	9	9	9	9
Net Generation	Y=A-B	MUs	188	224	224	225	224
Station Heat Rate	D	Kcal/kWh	1950	1950	1950	1950	1950
Calorific value of gas	F	Kcal/Scm	9509	9509	9509	9509	9509
Overall heat from gas	H= A x D	Gcal	382459	455308	455308	456555	455308
Actual gas consumption	M= (H x 1000)/F	M. scm	40.2	47.9	47.9	48.0	47.9
Price of gas	P1	Rs/scm	18.3	18.3	18.3	18.3	18.3
Cost of gas	N5=P1 x M/10 ⁵	Rs.M	734.2	874.1	874.1	876.5	874.1
Total fuel cost	N5	Rs.M	734.2	874.1	874.1	876.5	874.1
Fuel cost/unit (Gross)	P=N5/(A*10)	Rs/kWh	3.74	3.74	3.74	3.74	3.74
Fuel cost/unit (Net)	Q=N5/(Y*10)	Rs/kWh	3.90	3.90	3.90	3.90	3.90
Cost of fuel/G.Cal	R=(N5/H)*10 ⁶	Rs/Gcal	1919.7	1919.7	1919.7	1919.7	1919.7



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Annexure 6.10: Control period 2016-17 to 2020-21
Fuel costs (Gas) - Dhuvaran Gas 2

Item	Derivation	Unit	2016-17	2017-18	2018-19	2019-20	2020-21
Gross Generation	A	MUs	207	246	246	247	246
Auxiliary Consumption	C	%	3.00%	3.00%	3.00%	3.00%	3.00%
Auxiliary Consumption	B	MUs	6	7	7	7	7
Net Generation	Y=A-B	MUs	201	239	239	240	239
Station Heat Rate	D	Kcal/kWh	1950	1950	1950	1950	1950
Calorific value of gas	F	Kcal/Scm	9519	9519	9519	9519	9519
Overall heat from gas	H= A x D	Gcal	403383	480218	480218	481533	480218
Actual gas consumption	M= (H x 1000)/F	M. scm	42	50	50	51	50
Price of gas	P1	Rs/scm	19	19	19	19	19
Cost of gas	N5=P1 x M/10 ^{^5}	Rs.M	816	971	971	974	971
Total fuel cost	N5	Rs.M	816	971	971	974	971
Fuel cost/unit (Gross)	P=N5/(A*10)	Rs/kWh	3.94	3.94	3.94	3.94	3.94
Fuel cost/unit (Net)	Q=N5/(Y*10)	Rs/kWh	4.07	4.07	4.07	4.07	4.07
Cost of fuel/G.Cal	R=(N5/H)*10 ^{^5}	Rs/Gcal	2023	2023	2023	2023	2023



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Annexure 6.11: Control period 2016-17 to 2020-21
Fuel costs (Gas) - Utran Gas

Item	Derivation	Unit	2016-17	2017-18	2018-19	2019-20	2020-21
Gross Generation	A	MUs	165	0	0	0	0
Auxiliary Consumption	C	%	2.90%	0.00%	0.00%	0.00%	0.00%
Auxiliary Consumption	B	MUs	5	0	0	0	0
Net Generation	Y=A-B	MUs	160	0	0	0	0
Station Heat Rate	D	Kcal/kWh	2150	0	0	0	0
Calorific value of gas	F	Kcal/Scm	9802	9802	9802	9802	9802
Overall heat from gas	H= A x D	Gcal	354744	0	0	0	0
Actual gas consumption	M= (H x 1000)/F	M. scm	36.19	0	0	0	0
Price of gas	P1	Rs/scm	21.1	21.1	21.1	21.1	21.1
Cost of gas	N5=P1 x M/10 ⁵	Rs.M	763.63	0	0	0	0
Total fuel cost	N5	Rs.M	763.63	0	0	0	0
Fuel cost/unit (Gross)	P=N5/(A*10)	Rs/kWh	4.63	0	0	0	0
Fuel cost/unit (Net)	Q=N5/(Y*10)	Rs/kWh	4.77	0	0	0	0
Cost of fuel/G.Cal	R=(N5/H)*10 ⁵	Rs/Gcal	2152.62	0	0	0	0



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Annexure 6.12: Control period 2016-17 to 2020-21
Fuel costs (Gas) - Utran Extension

Item	Derivation	Unit	2016-17	2017-18	2018-19	2019-20	2020-21
Gross Generation	A	MUs	689	820	820	823	820
Auxiliary Consumption	C	%	3.00%	3.00%	3.00%	3.00%	3.00%
Auxiliary Consumption	B	MUs	21	25	25	25	25
Net Generation	Y=A-B	MUs	668	796	796	798	796
Station Heat Rate	D	Kcal/kWh	1850	1850	1850	1850	1850
Calorific value of gas	F	Kcal/Scm	9537	9537	9537	9537	9537
Overall heat from gas	H= A x D	Gcal	1274763	1517574	1517574	1521732	1517574
Actual gas consumption	M= (H x 1000)/F	M. scm	134	159	159	160	159
Price of gas	P1	Rs/scm	22	22	22	22	22
Cost of gas	N5=P1 x M	Rs.M	2904	3457	3457	3467	3457
Total fuel cost	N5	Rs.M	2904	3457	3457	3467	3457
Fuel cost/unit (Gross)	P=N5/(A*10)	Rs/kWh	4.21	4.21	4.21	4.21	4.21
Fuel cost/unit (Net)	Q=N5/(Y*10)	Rs/kWh	4.35	4.35	4.35	4.35	4.35
Cost of fuel/G.Cal	R=(N5/H)*10^5	Rs/Gcal	2278	2278	2278	2278	2278



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Annexure 6.13: Control period 2016-17 to 2020-21
Fuel costs (Coal, Lignite & Secondary Oil) – Sikka 3 & 4

Item	Derivation	Unit	2016-17	2017-18	2018-19	2019-20	2020-21
Gross Generation	A	MUs	2584	3066	3066	3074	3066
Auxiliary Consumption	C	%	9.00%	9.00%	9.00%	9.00%	9.00%
Auxiliary Consumption	B	MUs	233	276	276	277	276
Net Generation	Y=A-B	MUs	2352	2790	2790	2798	2790
Station Heat Rate	D	Kcal/kWh	2398	2398	2398	2398	2398
Sp. Oil Consumption	E	ml/kWh	1.00	1.00	1.00	1.00	1.00
Gross calorific value of coal	F	Kcal/Kg	5270	5270	5270	5270	5270
Calorific value of oil	G	Kcal/l	10310	10310	10310	10310	10310
Overall Heat	H= A x D	Gcal	6196912	7352268	7352268	7372411	7352268
Heat from Oil	I= (A x E x G)/1000	Gcal	26644	31612	31612	31698	31612
Heat from Coal	J = H-I	Gcal	6170267	7320656	7320656	7340713	7320656
Transit losses	K	%	0.00%	0.00%	0.00%	0.00%	0.00%
Coal Blend							
(A) Indigenous coal	X1	%	0%	0%	0%	0%	0%
(B) Washed Coal	X2	%	0%	0%	0%	0%	0%
(c) Imported Coal	X3	%	100%	100%	100%	100%	100%
Actual oil consumption	L= A x E	Kl	2584	3066	3066	3074.4	3066
Actual Coal consumption	M= (J x 1000)/F	MT	1170794	1389077	1389077	1392883	1389077
(A) Indigenous coal	Q1=M* x X1/(1-K)	MT	0	0	0	0	0
(B) Washed Coal	Q2=M* x X2 / (1-K)	MT	0	0	0	0	0
(C) Imported Coal	Q3=M* X X3	MT	1170794	1389077	1389077	1392883	1389077
Price of coal							
(A) Indigenous coal	P1	Rs./MT	0	0	0	0	0
(B) Washed Coal	P2	Rs./MT	0	0	0	0	0
(c) Imported Coal	P3	Rs./MT	4819	4819	4819	4819	4819
Price of oil	P4	Rs./Kl	23936	23936	23936	23936	23936
Coal Cost							
(A) Indigenous coal	N1=Q1 X P1	Rs.Lakh	0	0	0	0	0
(B) Washed Coal	N2=Q2 X P2	Rs.Lakh	0	0	0	0	0
(c) Imported Coal	N3=Q3 X P3	Rs.Lakh	56417	66936	66936	67119	66936
Total coal cost	N4= N1+N2+N3	Rs.Lakh	56417	66936	66936	67119	66936
Oil Cost	N5=P4 x L/10 ^{^5}	Rs.Lakh	619	734	734	736	734
Total fuel cost	O= N4+N5	Rs.Lakh	57036	67669	67669	67855	67669
Fuel cost/Unit (Gross)	P= O/(A*10)	Rs/kWh	2.21	2.21	2.21	2.21	2.21
Fuel cost/Unit (Net)	Q=O/(Y*10)	Rs/kWh	2.43	2.43	2.43	2.43	2.43
Cost of fuel/G.Cal	R=(O/H)*10 ^{^5}	Rs./Gcal	920	920	920	920	920



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Annexure 6.14: Control period 2016-17 to 2020-21
Fuel costs (Coal, Lignite & Secondary Oil) – Wanakbori 8

Item	Derivation	Unit	2016-17	2017-18	2018-19	2019-20	2020-21
Gross Generation	A	MUs	0	0	5957	5973	5957
Auxiliary Consumption	C	%	0.00%	0.00%	5.25%	5.25%	5.25%
Auxiliary Consumption	B	MUs	0	0	312.732	313.5888	312.732
Net Generation	Y=A-B	MUs	0	0	5644	5660	5644
Station Heat Rate	D	Kcal/kWh	0	0	2248	2248	2248
Sp. Oil Consumption	E	ml/kWh	0.00	0.00	0.50	0.50	0.50
Gross calorific value of coal	F	Kcal/Kg	4200	4200	4200	4200	4200
Calorific value of oil	G	Kcal/l	10327	10327	10327	10327	10327
Overall Heat	H= A x D	Gcal	0	0	13390886.4	13427573.76	13390886.4
Heat from Oil	I= (A x E x G)/1000	Gcal	0	0	30758	30842	30758
Heat from Coal	J = H-I	Gcal	0	0	13360128.46	13396731.55	13360128.46
Transit losses	K	%	0.00%	0.00%	0.80%	0.80%	0.80%
Coal Blend							
(A) Indigenous coal	X1	%	0%	0%	0%	0%	0%
(B) Washed Coal	X2	%	100%	100%	100%	100%	100%
(c) Imported Coal	X3	%	0%	0%	0%	0%	0%
Actual oil consumption	L= A x E	Kl	0	0	2978	2987	2978
Actual Coal consumption	M= (J x 1000)/F	MT	0	0	3180983	3189698	3180983
(A) Indigenous coal	Q1=M* x X1/(1-K)	MT	0	0	0	0	0
(B) Washed Coal	Q2=M* x X2 / (1-K)	MT	0	0	3206636	3215421	3206636
(c) Imported Coal	Q3=M* X X3	MT	0	0	0	0	0
Price of coal							
(A) Indigenous coal	P1	Rs./MT	0	0	0	0	0
(B) Washed Coal	P2	Rs./MT	5157	5157	5157	5157	5157
(c) Imported Coal	P3	Rs./MT	0	0	0	0	0
Price of oil	P4	Rs./Kl	21464	21464	21464	21464	21464
Coal Cost							
(A) Indigenous coal	N1=Q1 X P1/10^5	Rs.Lakh	0	0	0	0	0
(B) Washed Coal	N2=Q2 X P2/10^5	Rs.Lakh	0	0	165366	165819	165366
(c) Imported Coal	N3=Q3 X P3/10^5	Rs.Lakh	0	0	0	0	0
Total coal cost	N4= N1+N2+N3	Rs.Lakh	0	0	165366	165819	165366
Oil Cost	N5=P4 x L/10^5	Rs.Lakh	0	0	639	641	639
Total fuel cost	O= N4+N5	Rs.Lakh	0	0	166006	166460	166006
Fuel cost/Unit (Gross)	P= O/(A*10)	Rs/kWh	0	0	2.79	2.79	2.79
Fuel cost/Unit (Net)	Q=O/(Y*10)	Rs/kWh	0	0	2.94	2.94	2.94
Cost of fuel/G.Cal	R=(O/H)*10^5	Rs./Gcal	0	0	1240	1240	1240



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Annexure 6.15: Control period 2016-17 to 2020-21
Fuel costs (Coal, Lignite & Secondary Oil) – Dhuvaran STPS

Item	Derivation	Unit	2016-17	2017-18	2018-19	2019-20	2020-21
Gross Generation	A	MUs	0	0	0	0	11914
Auxiliary Consumption	C	%	0.00%	0.00%	0.00%	0.00%	5.25%
Auxiliary Consumption	B	MUs	0	0	0	0	625
Net Generation	Y=A-B	MUs	0	0	0	0	11288
Station Heat Rate	D	Kcal/kWh	0	0	0	0	2248
Sp. Oil Consumption	E	ml/kWh	0.00	0.00	0.00	0.00	0.50
Gross calorific value of coal	F	Kcal/Kg	4200	4200	4200	4200	4200
Calorific value of oil	G	Kcal/l	10327	10327	10327	10327	10327
Overall Heat	H= A x D	Gcal	0	0	0	0	26781773
Heat from Oil	I= (A x E x G)/1000	Gcal	0	0	0	0	61516
Heat from Coal	J = H-I	Gcal	0	0	0	0	26720257
Transit losses	K	%	0.00%	0.00%	0.00%	0.00%	0.80%
Coal Blend							
(A) Indigenous coal	X1	%	0%	0%	0%	0%	0%
(B) Washed Coal	X2	%	0%	0%	0%	0%	100%
(c) Imported Coal	X3	%	0%	0%	0%	0%	0%
Actual oil consumption	L= A x E	Kl	0	0	0	0	5957
Actual Coal consumption	M= (J x 1000)/F	MT	0	0	0	0	6361966
(A) Indigenous coal	Q1=M* x X1/(1-K)	MT	0	0	0	0	0
(B) Washed Coal	Q2=M* x X2 / (1-K)	MT	0	0	0	0	6413272
(c) Imported Coal	Q3=M* X X3	MT	0	0	0	0	0
Price of coal							
(A) Indigenous coal	P1	Rs./MT	0	0	0	0	0
(B) Washed Coal	P2	Rs./MT	5157	5157	5157	5157	5157
(c) Imported Coal	P3	Rs./MT	0	0	0	0	0
Price of oil	P4	Rs./Kl	21464	21464	21464	21464	21464
Coal Cost							
(A) Indigenous coal	N1=Q1 X P1/10^5	Rs.Lakh	0	0	0	0	0
(B) Washed Coal	N2=Q2 X P2/10^5	Rs.Lakh	0	0	0	0	330732
(c) Imported Coal	N3=Q3 X P3/10^5	Rs.Lakh	0	0	0	0	0
Total coal cost	N4= N1+N2+N3	Rs.Lakh	0	0	0	0	330732
Oil Cost	N5=P4 x L/10^5	Rs.Lakh	0	0	0	0	1279
Total fuel cost	O= N4+N5	Rs.Lakh	0	0	0	0	332011
Fuel cost/Unit (Gross)	P= O/(A*10)	Rs/kWh	0	0	0	0	2.79
Fuel cost/Unit (Net)	Q=O/(Y*10)	Rs/kWh	0	0	0	0	2.94
Cost of fuel/G.Cal	R=(O/H)*10^5	Rs./Gcal	0	0	0	0	1240



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Annexure 6.16: Control period 2016-17 to 2020-21
Fuel costs (Coal, Lignite & Secondary Oil) – Ukai 6

Item	Derivation	Unit	2016-17	2017-18	2018-19	2019-20	2020-21
Gross Generation	A	MUs	3197	3373	3373	3382	3373
Auxiliary Consumption	C	%	6.00%	6.00%	6.00%	6.00%	6.00%
Auxiliary Consumption	B	MUs	192	202	202	203	202
Net Generation	Y=A-B	MUs	3005.56	3170	3170	3179	3170
Station Heat Rate	D	Kcal/kWh	2385	2385	2385	2385	2385
Sp. Oil Consumption	E	ml/kWh	1	1	1	1	1
Gross calorific value of coal	F	Kcal/Kg	3821	3821	3821	3821	3821
Calorific value of oil	G	Kcal/l	10422	10422	10422	10422	10422
Overall Heat	H= A x D	Gcal	7625799	8043651	8043651	8065688	8043651
Heat from Oil	I= (A x E x G)/1000	Gcal	33324	35150	35150	35246	35150
Heat from Coal	J = H-I	Gcal	7592475	8008501	8008501	8030442	8008501
Transit losses	K	%	0.80%	0.80%	0.80%	0.80%	0.80%
Coal Blend							
(A) Indigenous coal	X1	%	22%	22%	22%	22%	22%
(B) Washed Coal	X2	%	78%	78%	78%	78%	78%
(c) Imported Coal	X3	%	0%	0%	0%	0%	0%
Actual oil consumption	L= A x E	Kl	3197	3373	3373	3382	3373
Actual Coal consumption	M= (J x 1000)/F	MT	1986792	2095657	2095657	2101399	2095657
(A) Indigenous coal	Q1=M* x X1/(1-K)	MT	432987	456712	456712	457963	456712
(B) Washed Coal	Q2=M* x X2 / (1-K)	MT	1562195	1647795	1647795	1652310	1647795
(c) Imported Coal	Q3=M* X X3	MT	0	0	0	0	0
Price of coal							
(A) Indigenous coal	P1	Rs./MT	3516	3516	3516	3516	3516
(B) Washed Coal	P2	Rs./MT	3799	3799	3799	3799	3799
(c) Imported Coal	P3	Rs./MT	6222	6222	6222	6222	6222
Price of oil	P4	Rs./Kl	32950	32950	32950	32950	32950
Coal Cost							
(A) Indigenous coal	N1=Q1 X P1/10 ^{^5}	Rs.Lakh	15224	16058	16058	16102	16058
(B) Washed Coal	N2=Q2 X P2/10 ^{^5}	Rs.Lakh	59342	62594	62594	62765	62594
(c) Imported Coal	N3=Q3 X P3/10 ^{^5}	Rs.Lakh	0	0	0	0	0
Total coal cost	N4= N1+N2+N3	Rs.Lakh	74566	78652	78652	78867	78652
Oil Cost	N5=P4 x L/10 ^{^5}	Rs.Lakh	1054	1111	1111	1114	1111
Total fuel cost	O= N4+N5	Rs.Lakh	75620	79763	79763	79982	79763
Fuel cost/Unit (Gross)	P= O/(A*10)	Rs/kWh	2.37	2.37	2.37	2.37	2.37
Fuel cost/Unit (Net)	Q=O/(Y*10)	Rs/kWh	2.52	2.52	2.52	2.52	2.52
Cost of fuel/G.Cal	R=(O/H)*10 ^{^5}	Rs./Gcal	992	992	992	992	992



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Annexure 6.17: Control period 2016-17 to 2020-21
Fuel costs (Gas) – Dhuvran 3

Item	Derivation	Unit	2016-17	2017-18	2018-19	2019-20	2020-21
Gross Generation	A	MUs	692	824	824	826	824
Auxiliary Consumption	C	%	3.00%	3.00%	3.00%	3.00%	3.00%
Auxiliary Consumption	B	MUs	21	25	25	25	25
Net Generation	Y=A-B	MUs	671	799	799	801	799
Station Heat Rate	D	Kcal/kWh	1850	1850	1850	1850	1850
Calorific value of gas	F	Kcal/Scm	9826	9826	9826	9826	9826
Overall heat from gas	H= A x D	Gcal	1279966	1523769	1523769	1527944	1523769
Actual gas consumption	M= (H x 1000)/F	M. scm	130	155	155	156	155
Price of gas	P1	Rs/scm	11.62	11.62	11.62	11.62	11.62
Cost of gas	N5=P1 x M/10 ⁵	Rs.M	1514	1802	1802	1807	1802
Total fuel cost	N5	Rs.M	1514	1802	1802	1807	1802
Fuel cost/unit (Gross)	P=N5/(A*10)	Rs/kWh	2.19	2.19	2.19	2.19	2.19
Fuel cost/unit (Net)	Q=N5/(Y*10)	Rs/kWh	2.26	2.26	2.26	2.26	2.26
Cost of fuel/G.Cal	R=(N5/H)*10 ⁵	Rs/Gcal	1183	1183	1183	1183	1183



7 Compliance of Directives

7.1 Compliance of Directives issued by the Commission

The Commission in its tariff order dated 31st March, 2015 and 31st March, 2016 had issued certain directives to GSECL. The GSECL has submitted the status of compliance of directives issued by the Commission.

The compliance of directives issued by the Commission and issue of new directives are discussed below:

7.2 Earlier Directives

7.2.1 Directive 1: Renovation and Modernization (R&M) of Thermal Plant

GSECL may submit its further plan for R&M of Ukai Unit 1 & 2. Further, GSECL may also submit a quarterly progress report of the R&M activities being undertaken for Wanakbori 1-6.

Compliance as per current petition:

- R&M work of Ukai Unit No.1 & 2 completed on 24.02.2010.
- C&I up-gradation work of Wanakbori TPS Unit No.6 is completed on 17.05.2015. So Unit No.2, 3, 4, 5 & 6 are completed. Work of Unit No: 1 will be started as per the program of SLDC for Shut Down.

Commission's comments:

The Progress of the work of Wanakbori Unit No. 1 may be submitted by GSECL

Further Compliance:

The C&I upgradation(R&M) work of WTPS-1 is planned during November 2016-March 2017.

Commission's comments:

GSECL shall submit the completion report of R&M works of WTPS-1.

7.2.2 Directive 2: Preparedness to face competition

GSECL may submit its preparedness for facing competition indicating the action taken / proposed to be taken to bring down the overall cost of generation.



Compliance as per current petition:

To improve efficiency and bring down the Generation Cost of old machine and to compete with private generators, GSECL has initiated certain proven technological advancement works, which are submitted at Annexure-I of the petition.

Also, GSECL has planned to enhance capacity building by installing Super Critical Machines having modern technology and high performance parameters which may also help GSECL to compete with private generators. It is also submitted vide Annexure-I of the petition.

Commission's comments:

The progress on the above works may be submitted by GSECL at quarterly intervals. The Annexure-I, as submitted by GSECL is attached to this order.

The actions planned by GSECL to compete with private generation companies are attached herewith as Annexure A. However, GSECL may submit its preparedness for facing competition indicating the action taken / proposed to be taken to bring down the overall cost of generation.

Further Compliance

Work progress is submitted as ANNEXURE-I of the petition.

Commission's comments:

The Commission noted the submission.

7.2.3 Directive 3: Inefficiency of Sikka Unit 1 & 2

GSECL is directed to examine the inefficiency, if any, of Sikka power station and intimate the Commission of the action taken in this regard within a period of 3 months.

Compliance as per current petition:

Efficiency of Sikka TPS is improving gradually after completion of de-silting. As such there is no inefficiency noticed.

Commission's comments:

The action taken by GSECL is noted. The Auxiliary consumption, which is 11.71%, against 11.00% approved for FY 2014-15, needs to be brought down further.

Further Compliance

The percentage of Backing Down and RSD is 68.44% during FY 2015-16. During RSD period minimum Auxiliaries are required to be run to keep the Units available for Generation as per requirement of SLDC. This adds to Percentage of Auxiliary Consumption. If Generation is increased, then Auxiliary Consumption may go down.

Commission's comments:

Submission of GSECL noted. The Commission has also noted that Sikka 1&2 plants are planned to be decommissioned in FY 2017-18.

7.2.4 Directive 4: Actual Performance Parameters

GSECL shall submit month wise, at quarterly intervals, the actual performance parameters like PAF, PLF, SHR, Aux. Consumption, SFC, Transit loss etc. actual gross generation, actual net generation and coal stock position (both imported and indigenous) for each station to the Commission and also place the said information on its website.

Compliance:

Performance Parameter and Coal Stock Position month wise at quarterly intervals are attached as Annexure-II and Annexure-III of the petition.

Commission's comments:

The Commission has noted the submission of GSECL. GSECL shall continue to submit the report as per directive.

7.3 New Directives

7.3.1 Calculation of Depreciation

The Commission directs the petitioner to calculate depreciation for true-up from FY 2017-18 as per Regulation 39 of GERC (MYT) Regulations, 2016.



7.3.2 Deviation in Capital Expenditure

GSECL is directed to submit a prior intimation to the Commission with proper justification for any variation of more than 10% between approved and actual CAPEX.

7.3.3 Lignite Cost for KLTPS

It is observed by the Commission that in FY 2016-17 lignite price for KLTPS has exorbitantly increased. GSECL shall take up the matter with appropriate authority to procure the lignite at a rate which is at par or lesser than the equally placed lignite thermal power station in the state.

7.3.4 Procurement of coal from Western Coal Fields

GSECL should take up the matter with appropriate authority to maximize coal procurement from Western Coal Fields, so as to reduce the fuel cost by saving on freight charges.

7.3.5 Green Cess on Coal Cost

GSECL is advised to take up the matter with appropriate authority to rationalize the Green Cess imposed on procurement of coal for charging the Green Cess in the ratio of RPO fulfillment by the state/entity.

It is also observed by the Commission that Green Cess is imposed by the Government of India uniformly across the coal quality. GSECL is advised to take up the matter with appropriate authority to get the necessary amendment so as to reduce the overall cost of fuel.

7.3.6 Fuel Supply Arrangements

GSECL is directed to initiate efforts for optimizing fuel supply arrangements and submit the detailed report related to existing FSA with details related to take or pay liabilities, practice for procuring imported fuel, and present arrangement and action required for optimization of fuel supply arrangement by 30th June, 2017.



COMMISSION'S ORDER

The Commission approves the station-wise fixed charges and energy charges for the FY 2017-18 as outlined in the Table below:

Sr. No.	Power Station	Annual Fixed Charges for 2017-18 (Rs. Crore)	Energy Charges 2017-18 (Rs./kWh)
1	Ukai (1-5)	364.38	2.862
2	Gandhinagar (3-4)	188.41	3.308
3	Wanakbori 1-6 TPS	483.87	3.269
4	Sikka TPS	118.91	3.870
5	KLTPS 1-3	229.48	1.496
6	KLTPS 4	105.38	1.469
7	Dhuvaran CCPP 2	81.25	4.066
8	Ukai Hydro	31.20	0.000
9	Kadana Hydro	66.98	0.000
10	Ukai Extn. 6*	506.21	2.516
11	Gandhinagar 5*	68.73	3.912
12	Wanakbori 7 TPS*	60.38	3.093
13	Dhuvaran CCPP 1*	68.24	3.899
14	Dhuvaran CCPP 3*	306.40	2.256
15	Utran Extension*	246.92	4.345
16	Sikka Extn. (3-4)*	622.35	2.425
	Total	3549.09	

The net gain of Rs. 23.52 Crore approved in the truing up for FY 2015-16 is to be passed on to the DISCOMs in 12 equal monthly installments through GUVNL.

This order shall come into force with effect from 1st April, 2017.

Sd/-

P. J. THAKKAR
Member

Sd/-

K. M. SHRINGARPURE
Member

Sd/-

ANAND KUMAR
Chairman

Place: Gandhinagar
Date: 31.03.2017

