

# PERFORMANCE EVALUATION REPORT

## PUBLIC SECTOR GENERATION COMPANIES

Jamshoro Power Company Limited (JPCL, GENCO-I)

Central Power Generation Company Limited (CPGCL, GENCO-II)

Northern Power Generation Company Limited (NPGCL, GENCO-III)

Lakhra Power Generation Company Limited (LPGCL, GENCO-IV)



NATIONAL ELECTRIC POWER REGULATORY AUTHORITY  
ISLAMIC REPUBLIC OF PAKISTAN



2016-17  
2017-18

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**EXECUTIVE SUMMARY**

National Electric Power Regulatory Authority (NEPRA) regulates the power sector in Pakistan and protects the interests of consumers and companies providing electric power services. As such, apart from monitoring the performance of transmission and distribution licensees, NEPRA also monitors the performance of generation licensees.

NEPRA framed Performance Standards Generation Rules (PSGR) back in 2009. Under PSGR, each operational generation licensee is required to submit a quarterly report to NEPRA on regular basis, particularly with respect to parameters such as Reference Capacity/Net Capacity, Planned/Unplanned Outage Hours, Availability Factor, Net Capacity Factor, Net Output Factor and Energy Availability Factor. The main purpose/objective of these parameters is to ascertain whether;

- i. The net capacity of power plant remained equal/higher to that approved by NEPRA in its tariff determination or otherwise.
- ii. The power plant availed outages in accordance with the Power Purchase Agreement signed with CPPA-G or otherwise.
- iii. The CPPA-G imposed Liquidated Damages on non-performance of power plant or otherwise.
- iv. The power plant remained under-utilized or otherwise.

Accordingly, the quarterly reports submitted by public sector GENCOs for the FY 2016-17 and 2017-18 were reviewed and a comprehensive Performance Evaluation Report has been prepared. The report mainly highlights the following key findings;

- i. **Reduction in Net Capacity:** The data submitted by GENCOs for the FY 2016-17 and 2017-18 reflects that a number of units/machines of different power stations of GENCOs have failed to ensure the Net Capacity as approved by NEPRA in their respective tariff determinations (upon which they are receiving capacity payments). This resulted into a cumulative energy loss of about **479.573 Million kWh**, translating into a financial impact of **Rs.4.025 Billion**, as per the following details;

GENCO	Energy Loss (Million kWh)	Financial Impact (Rs. Billion)
I	66.270	0.635
II	195.554	1.219
III	204.649	2.118
IV	13.100	0.053
<b>Total</b>	<b>479.573</b>	<b>4.025</b>

These units include Units 1 to 4 of TPS Jamshoro (GENCO-I), Units 3, 5, 6, 11 & 12 of TPS Guddu & Unit 15 of Guddu 747 CCPP (GENCO-II), Units 1, 4 & 5 of TPS Muzaffargarh, Unit 9 of GTPS Faisalabad, Unit 2 of SPS Faisalabad & Nandipur Power Plant (GENCO-III) and Units 1 & 2 of Lakhra Power Station (GENCO-IV).

- ii. **Availing Higher Outages/Reduction in Availability Factor:** The data submitted by GENCOs for the FY 2016-17 and 2017-18 indicates that a number of units/machines of different power stations of GENCO-I, II & III availed higher outage hours than allowed limit as specified in their respective Power Purchase Agreements, resulting in reduction of their Availability Factor. Had these units not availed higher outage hours, a huge amount of energy - around **9373.003 Million kWh** could have been contributed by them to the national grid (subject to dispatch by the system operator), amounting to **Rs. 64.629 Billion** as per the following details;

GENCO	Energy Loss (Million kWh)	Financial Impact (Rs. Billion)
I	21.946	0.190
II	7542.448	48.502
III	1808.609	15.937
<b>Total</b>	<b>9373.003</b>	<b>64.629</b>

These units include Unit 2 of TPS Jamshoro & Units 3 & 5 of GTPS Kotri (GENCO-I), Units 1, 2, 4, 7, 8, 9, 11 & 13 of TPS Guddu & Units 14, 15 & 16 of Guddu 747 CCPP (GENCO-II) and Units 4, 5 & 6 of TPS Muzaffargarh, Unit 1 of SPS Faisalabad & Nandipur Power Plant (GENCO-III).

It is pertinent to mention that CPPA-G has imposed liquidated damages amounting to **Rs. 2.093 Billion** on GENCO-I, II & III, on account of availing higher outages that allowed limit as specified in their respective Power Purchase Agreements during the FY 2016-17. However, the same is still in process for the FY 2017-18.

- iii. **Longer Duration of Standby Mode:** The data submitted by GENCOs for the FY 2016-17 and 2017-18 shows that a number of units/machines of different power stations of GENCO-I, II & III remained on standby mode for an alarming longer duration, which resulted in the consumption of auxiliary power and a subsequent financial loss of around **Rs. 1.031 Billion** to the national exchequer.

On enquiry from GENCOs in this regard, it was revealed that instructions from the system operator (NPCC) due to no demand and fuel constraints were the major reasons of such longer duration of standby mode.

- iv. **Net Capacity Factor:** The Net Capacity Factor is the ratio of net actual generation to the product of net capacity and period hours.

The data pertaining to Net Capacity Factor, as submitted by public sector GENCOs for the FY 2016-17 and 2017-18, reveals that the Net Capacity Factor of all the GENCOs remained low (**less than 68%**) during the said period, owing to increased duration of outages and underutilization of power plants. Particularly, the Net Capacity Factor of GTPS Kotri (GENCO-I), GTPS & SPS Faisalabad (GENCO-III) and Lakhra PS (GENCO-IV) remained only **10%, 6%, 1%** and **2%** respectively during the FY 2017-18, which raises serious question marks on the performance of these power stations.

- v. **Net Output Factor:** The Net Output Factor is the ratio of net actual generation to the product of net capacity and service hours. Its value should be nearly equal to 100%.

The data pertaining to Net Output Factor as submitted by public sector GENCOs for the FY 2016-17 and 2017-18, depicts that the Net Output Factor of TPS Guddu & Guddu 747 (GENCO-II) and TPS Muzaffargarh & Nandipur Power Plant (GENCO-III) remained low (**less than 80%**) during the FY 2016-17 and 2017-18. Similarly, the Net Output Factor of TPS Jamshoro & GTPS Kotri (GENCO-I) remained only **71%** and **76%** respectively during the FY 2017-18 and that of Lakhra Power Station (GENCO-IV) remained only **66%** during the FY 2016-17, which clearly speaks of the underutilization of these power plants during the said period.

Concluding, it can be said that as a result of successive legal actions taken by NEPRA on non-performance of GENCO-I, II & III during the calendar years 2012 to 2014 (resulting in imposition of Rs. 5 Million each on GENCO-I, II & III) and during the fiscal years 2015 and 2016 {(resulting in imposition of Rs. 2 Million fine each on GENCO-I & II (legal proceedings against GENCO-III are currently under process)}, the performance of abovementioned GENCOs has considerably been improved during the FY 2016-17 and 2017-18. However, the same is still beyond the targets as approved by NEPRA in their respective tariff determinations with respect to reduction in net capacity and as specified in their respective Power Purchase Agreements signed with CPPA-G with respect to availing higher outages.



# **PERFORMANCE STANDARDS (GENERATION) RULES, 2009**

## 1. Performance Standards (Generation) Rules (PSGR) 2009

In exercise of the Powers conferred by and clause (k) of section 46 of the Regulation of Generation, Transmission and Distribution of Electric Power Act, 1997 (XL of 1997), read with clause (c) of sub section (2) of section 7 and section 34 thereof, the National Electric Power Regulatory Authority (NEPRA), with the prior approval of the Federal Government, is pleased to make the following Rules to ensure that the electric generation facilities and power plants are efficiently operated to further ensure electrical service reliability and adequacy to the transmission and distribution service provider within prescribed parameters of Performance Standards (Generation) Rules (PSGR) 2009.

**Quality of Supply - Rule 3 of PSGR 2009** states that "In order to maintain Performance Standards, the generation facilities are required to ensure that the voltage and frequency of electricity supplied to recipients shall be within normal operation limits contained in the 'applicable documents' as defined in clause (iv) of sub rule 1 of rule 2 NEPRA Licensing (Generation) Rules, 2000, rules 7 & 8 of NEPRA Performance Standards (Transmission) Rules 2005 and NEPRA clauses (d) & (e) of the rule 4 of Performance Standards (Distribution) Rules 2005".

**Data Requirement - Rule 4 of PSGR 2009** states that "As part of Generator Performance Data System, the licensee shall calculate the following key indicators and others as indicated in Forms I and II to these rules for its generating facilities and submit on regular basis, a report to the Authority under sub-rule (2) of rule 5, namely:-

- (a) Energy Loss Rate (ELR)
- (b) Energy Availability Factor (EAF)
- (c) Equivalent Planned Outage Factor (EPOF)"

**Reporting Requirement - Rule 5 (2) of PSGR 2009** states that "Reports required for the key indicators under rule 4 shall be submitted on quarterly basis and the first report thereof shall be due after the publication of these rules in the official Gazette.

# INTRODUCTION

## 2. INTRODUCTION:

### 2.1 Jamshoro Power Company Limited (JPCL, GENCO-I)

#### 2.1.1 Thermal Power Station Jamshoro (Units 1 to 4):

S.No.	Details of Generation Facility		
1.	License Issuance Date	July 01, 2002	
2.	License Expiry Date	June 30, 2021	
3.	License Number	GL/01/2002	
4.	Location of Plant	Jamshoro, Sindh	
5.	Type of Facility	Thermal Power Plant	
6.	Installed Capacity	880 MW	
7.	Net Capacity	649.02 MW	
8.	Number of Units	4	Steam Turbines
			3*210 MW 1*250 MW
9.	Primary Fuel	Furnace Oil	
10.	Alternate Fuel	Unit 1	Nil
		Units 2 to 4	Natural Gas

**Table 1**



**Figure 1**

**2.1.2 Thermal Power Station Jamshoro (Units 5 & 6):**

S.No.	Details of Generation Facility		
1.	License Issuance Date	August 11, 2014	
2.	License Expiry Date	December 30, 2049	
3.	License Number	GL/01/2002	
4.	Location of Plant	Jamshoro, Sindh	
5.	Type of Facility	Thermal Power Plant	
6.	Installed Capacity	1320 MW	
7.	Net Capacity	1200 MW	
8.	Number of Units	Steam Turbine	2*660 MW
9.	Primary Fuel	Imported/Local Coal	
10.	Alternate Fuel	Nil	
11.	Expected COD	Unit 5	December 31, 2018
		Unit 6	December 31, 2019

**Table 2**



**Figure 2**

### 2.1.3 Gas Turbine Power Station Kotri:

S.No.	Details of Generation Facility			
1.	License Issuance Date	July 01, 2002		
2.	License Expiry Date	June 30, 2021		
3.	License Number	GL/01/2002		
4.	Location of Plant	Kotri, Sindh		
5.	Type of Facility	Combined Cycle		
6.	Installed Capacity	144 MW		
7.	Net Capacity	106.5 MW		
8.	Number of Units	5	Gas Turbines	4*25 MW
			Steam Turbine	1*44 MW
9.	Primary Fuel	Natural Gas		
10.	Alternate Fuel	High Speed Diesel		

**Table 3**



**Figure 3**

## 2.2 Central Power Generation Company Limited (CPGCL, GENCO-II)

### 2.2.1 Thermal Power Station Guddu:

S.No.	Details of Generation Facility		
1.	License Issuance Date	July 01, 2002	
2.	License Expiry Date	June 30, 2017	
3.	License Number	GL/02/2002	
4.	Location of Plant	Jacobabad, Sindh	
5.	Type of Facility	Thermal	
6.	Installed Capacity	1655 MW	
7.	Net Capacity	1400 MW	
8.	Number of Units	13	Gas Turbines 2*110+2*210+4*100+2*136 MW
			Steam Turbines 2*100+1*143 MW
9.	Primary Fuel	Natural Gas	
10.	Alternate Fuel	Units 3 & 4	Furnace Oil
		Other Units	Nil

**Table 4**



**Figure 4**

### 2.2.2 Guddu 747 Combined Cycle Power Plant:

S.No.		Details of Generation Facility		
1.	License Issuance Date	April 26, 2013		
2.	License Expiry Date	June 30, 2017		
3.	License Number	GL/02/2002		
4.	Location of Plant	Jacobabad, Sindh		
5.	Type of Technology	Combined Cycle		
6.	Installed Capacity	776.7 MW		
7.	Net Capacity	720.79 MW		
8.	Number of Units	3	Gas Turbines	2*255.6 MW
			Steam Turbine	1*265.5 MW
9.	Primary Fuel	Natural Gas		
10.	Alternate Fuel	High Speed Diesel Oil		

**Table 5**



**Figure 5**

## **2.3 Northern Power Generation Company Limited (NPGCL, GENCO-III)**

### **2.3.1 Thermal Power Station Muzaffargarh:**

<b>S.No.</b>	<b>Details of Generation Facility</b>			
<b>1.</b>	License Issuance Date	July 01, 2002		
<b>2.</b>	License Expiry Date	June 30, 2027		
<b>3.</b>	License Number	GL/03/2002		
<b>4.</b>	Location of Plant	Muzaffargarh, Punjab		
<b>5.</b>	Type of Facility	Thermal		
<b>6.</b>	Installed Capacity	1350 MW		
<b>7.</b>	Net Capacity	1183.52 MW		
<b>8.</b>	Number of Units	6	Steam Turbines	3*210+1*320+2*200 MW
<b>9.</b>	Primary Fuel	Furnace Oil		
<b>10.</b>	Alternate Fuel	Natural Gas		

**Table 6**



**Figure 6**

### 2.3.2 Gas Turbine Power Station Faisalabad:

S.No.	Details of Generation Facility		
1.	License Issuance Date	July 01, 2002	
2.	License Expiry Date	June 30, 2027	
3.	License Number	GL/03/2002	
4.	Location of Plant	Faisalabad, Punjab	
5.	Type of Facility	Combined Cycle	
6.	Installed Capacity	144 MW	
7.	Net Capacity	132 MW	
8.	Number of Units	5	Gas Turbines 4*25 MW
			Steam Turbine 1*44 MW
9.	Primary Fuel	Natural Gas	
10.	Alternate Fuel	High Speed Diesel	

**Table 7**

### 2.3.3 Steam Power Station Faisalabad:

S.No.	Details of Generation Facility		
1.	License Issuance Date	July 01, 2002	
2.	License Expiry Date	June 30, 2027	
3.	License Number	GL/03/2002	
4.	Location of Plant	Faisalabad, Punjab	
5.	Type of Facility	Thermal	
6.	Installed Capacity	132 MW	
7.	Net Capacity	97 MW	
8.	Number of Units	2	Steam Turbines 2*66 MW
9.	Primary Fuel	Natural Gas	
10.	Alternate Fuel	Furnace Oil	

**Table 8**

### 2.3.4 Combined Cycle Power Plant Nandipur:

S.No.	Details of Generation Facility		
1.	License Issuance Date	October 31, 2014	
2.	License Expiry Date	June 30, 2027	
3.	License Number	GL/03/2002	
4.	Location of Plant	Gujranwala, Punjab	
5.	Type of Facility	Combined Cycle	
6.	Installed Capacity	565.65 MW	
7.	Net Capacity	510 MW	
8.	Number of Units	4	Gas Turbines 3*122.1 MW
			Steam Turbine 1*199.35 MW
9.	Primary Fuel	Furnace Oil	
10.	Alternate Fuel	Natural Gas	

**Table 9**



Figure 7

#### 2.4 Lakhra Power Generation Company Limited (LPGCL, GENCO-IV):

S.No.	Details of Generation Facility			
1.	License Issuance Date	February 18, 2005		
2.	License Expiry Date	February 17, 2020		
3.	License Number	GL/06/2005		
4.	Location of Plant	Dadu, Sindh		
5.	Type of Facility	Thermal		
6.	Installed Capacity	150 MW		
7.	Net Capacity	93 MW		
8.	Number of Units	3	Steam Turbines	3*50 MW
9.	Fuel Type	Lignite Coal		

Table 10



Figure 8

## ANALYSIS

### 3.1 Reduction in Net Capacity:

According to Performance Standards (Generation) Rules, 2009;

**Net Capacity** is the unit's maximum generating capacity based on IDC (Initial Dependable Capacity) or AIDC (Annual Initial Dependable Capacity) less any station service or auxiliary power requirements in MW utilized for that unit.

Net Capacity is determined when there are no short term equipment problems causing a temporary derating of the unit and all major equipment is operating at full load under designed temperatures and pressures.

While reviewing the quarterly reports submitted by public sector GENCOs for the FY 2016-17 and 2017-18, it has been observed that *the Net Capacity of a number of units/machines of different power stations of GENCOs remained lower than that approved by NEPRA in their respective tariff determinations.* This resulted into a cumulative energy loss of about **479.573 Million kWh**, translating into a financial impact of **Rs. 4.025 Billion**. The detail is as under;

Table 11

Unit	Year	Installed	Capacity			Energy Loss (Million kWh)	Financial Impact (Rs. Billion)
			Net				
			Actual	Approved	Reduction		
			1	2	3 = 2-1		
GENCO I							
TPS Jamshoro							
1	2016-17	250	181.70	182.45	0.75	4.752	0.046
	2017-18		180.36		2.09	7.646	0.086
2	2016-17	200	154.16	154.73	0.57	2.930	0.030
	2017-18		154.21		0.52	1.551	0.016
3	2016-17	200	154.16	155.36	1.2	7.408	0.067
	2017-18		154.38		0.98	3.776	0.038
4	2016-17	200	153.54	156.48	2.94	21.946	0.198
	2017-18		153.29		3.19	16.261	0.154
Overall	2016-17	850		649.02		37.036	0.341
	2017-18					29.235	0.294
Sub Total						66.270	0.635
GTPS Kotri							
3	2016-17	25	21.98	18	0	0	0
	2017-18		21.97		0	0	0
4	2016-17	25	21.98	18	0	0	0
	2017-18		21.98		0	0	0
5	2016-17	25	21.79	18	0	0	0
	2017-18		21.76		0	0	0

Unit	Year	Installed	Capacity			Energy Loss (Million kWh)	Financial Impact (Rs. Billion)
			Net				
			Actual 1	Approved 2	Reduction 3 = 2-1		
6	2016-17	25	21.77	18	0	0	0
	2017-18		21.76		0	0	0
7	2016-17	44	38.28	35	0	0	0
	2017-18		35.09		0	0	0
Overall	2016-17	144		107		0	0
	2017-18					0	0
Sub Total						0	0
Total						66.270	0.635
GENCO II							
TPS Guddu							
1	2016-17	110	85	70	0	0	0
	2017-18		85		0	0	0
2	2016-17	110	85	70	0	0	0
	2017-18		85		0	0	0
3	2016-17	210	168.77	170	1.23	2.430	0.020
	2017-18		165.22		4.78	10.408	0.060
4	2016-17	210	180	170	0	0	0
	2017-18		180		0	0	0
5	2016-17	100	80.19	85	4.81	32.477	0.260
	2017-18		81.49		3.51	29.173	0.198
6	2016-17	100	80.42	85	4.58	22.089	0.177
	2017-18		81.69		3.31	26.677	0.181
7	2016-17	100	94.35	90	0	0	0
	2017-18		93.98		0	0	0
8	2016-17	100	94.29	90	0	0	0
	2017-18		94.11		0	0	0
9	2016-17	100	94.10	90	0	0	0
	2017-18		94.02		0	0	0
10	2016-17	100	94.07	90	0	0	0
	2017-18		93.96		0	0	0
11	2016-17	136	129.73	130	0.27	1.277	0.008
	2017-18		129.61		0.39	1.293	0.007
12	2016-17	136	129.55	130	0.45	2.041	0.013
	2017-18		129.4		0.6	4.583	0.024
13	2016-17	143	140	130	0	0	0
	2017-18		140		0	0	0
Overall	2016-17	1655		1400		60.315	0.478
	2017-18					72.134	0.471
Sub Total						132.449	0.948



Unit	Year	Installed	Capacity			Energy Loss (Million kWh)	Financial Impact (Rs. Billion)
			Net				
			Actual 1	Approved 2	Reduction 3 = 2-1		
Guddu 747 CCPP							
14	2016-17	255.6	243	241.72	0	0	0
	2017-18		243		0	0	0
15	2016-17	255.6	233.5	241.72	8.22	63.105	0.271
	2017-18		243		0	0	0
16	2016-17	265.5	261	237.35	0	0	0
	2017-18		261		0	0	0
Overall	2016-17	776.7		720.79		63.105	0.271
	2017-18					0	0
Sub Total						63.105	0.271
Total						195.554	1.219
GENCO III							
TPS Muzaffargarh							
1	2016-17	210	183.86	190	6.14	42.486	0.446
	2017-18		183.52		6.48	27.179	0.342
2	2016-17	210	184.72	182.5	0	0	0
	2017-18		183.84		0	0	0
3	2016-17	210	186.24	183.5	0	0	0
	2017-18		186.28		0	0	0
4	2016-17	320	266.37	272.2	5.83	35.476	0.372
	2017-18		266.7		5.5	22.687	0.286
5	2016-17	200	180.24	181.44	1.2	6.634	0.070
	2017-18		181.58		0	0.000	0
6	2016-17	200	177.84	173.88	0	0	0
	2017-18		179.02		0	0	0
Overall	2016-17	1350		1183.52		84.596	0.888
	2017-18					49.866	0.628
Sub Total						134.462	1.517
GTPS Faisalabad							
5	2016-17	25	22.86	20	0	0	0
	2017-18		22.83		0	0	0
6	2016-17	25	22.87	20	0	0	0
	2017-18		22.86		0	0	0
7	2016-17	25	22.86	20	0	0	0
	2017-18		22.83		0	0	0
8	2016-17	25	22.87	20	0	0	0
	2017-18		22.89		0	0	0
9	2016-17	44	36.53	37	0.5	0.997	0.006
	2017-18		37.02		0	0	0
Overall	2016-17	125		117		0.997	0.006
	2017-18					0	0
Sub Total						0.997	0.006

Unit	Year	Installed	Capacity			Energy Loss (Million kWh)	Financial Impact (Rs. Billion)
			Net				
			Actual 1	Approved 2	Reduction 3 = 2-1		
SPS Faisalabad							
1	2016-17	66	50	48.5	0	0	0
	2017-18		50		0	0	0
2	2016-17	66	43.95	48.5	4.55	13.760	0.151
	2017-18		43.50		5	0.934	0.007
Overall	2016-17	132		97		13.760	0.151
	2017-18					0.934	0.007
Sub Total						14.694	0.159
CCPP Nandipur							
1	2016-17	425	401.83	411.34	9.51	44.871	0.359
	2017-18		410.03		1.31	9.625	0.077
Sub Total						54.496	0.436
Total						204.649	2.118
GENCO IV							
Lakhra PS							
1	2016-17	50	28.4	31.2	2.8	0.797	0.003
	2017-18		25.52		5.68	0.336	0.002
2	2016-17	50	28.4	31.2	2.8	11.161	0.045
	2017-18		25.52		5.68	0.807	0.004
3	2016-17	50	-	31.2	REQUIRES REHABILITATION		
	2017-18						
Overall	2016-17	150		93.6		11.957	0.048
	2017-18					1.143	0.005
Total						13.100	0.053
Grand Total						479.573	4.025

**Note:**

- 'Actual Net Capacity' has been worked out by deducting the auxiliary power (MW) consumed by the units/machines of GENCO-I, II, III & IV during service mode from the 'De-rated Capacity' as mentioned in their respective generation licenses.
- 'Approved Net Capacity' is the net capacity approved by NEPRA in the respective tariff determinations of abovementioned GENCOs.
- Energy Loss has been worked out by multiplying the reduction in net capacity to the service hours availed by the units/machines of GENCO-I, II, III, & IV.
- Similarly, the financial impact has been calculated by multiplying the energy loss to the selling rate of the units/machines of abovementioned GENCOs as worked out from the Energy Procurement Reports submitted by CPPA-G. The details are attached at **Annex I**.

### 3.2 Availing Higher Outage Hours:

According to Performance Standards (Generation) Rules 2009;

**Outage Hours** are the sum of Planned Outage Hours and Unplanned Outage Hours.

Where;

**Planned Outage Hours** are the sum of all hours the unit was offline due to planned or scheduled outages (outages planned well in advance such as annual overhauls); and

**Unplanned Outage Hours** are the sum of all hours the unit was offline due to sudden, delayed, postponed, startup failure outages.

While reviewing the quarterly reports submitted by public sector GENCOs for the FY 2016-17 and 2017-18, it has been observed that a number of units/machines of different power stations of GENCO-I, II & III availed higher outage hours than allowed limit as specified in their respective Power Purchase Agreement. Had these units not availed higher outage hours, they could have contributed around **9373.003 Million kWh** to the national grid (subject to dispatch by system operator) amounting to **Rs. 64.629 Billion**. The detail is as under;

Table 12

Table 12								
Unit	Period	Outage Hours (% of Period Hours)					Unused Energy Potential (Million kWh)	Energy Cost (Rs. Billion)
		Actual			Allowed	Extra		
		Planned	Forced	Total				
		1	2	3 = 1+2	4	5 = 3-4	6	7
GENCO I								
TPS Jamshoro								
2	2016-17	25	10	35	33.8	1.2	15.781	0.159
	2017-18	Within Range						
1,3,4	2016-17							
	2017-18							
Sub Total							15.781	0.159
GTPS Kotri								
3	2016-17	Within Range						
	2017-18	0	20.4	20.4	17.4	3	4.697	0.020
5	2016-17	0	18.3	18.3	17.4	0.9	1.468	0.011
	2017-18	Within Range						
4,6,7	2016-17	Within Range						
	2017-18							
Sub Total							6.165	0.031
Total							21.946	0.190

Unit	Period	Outage Hours (% of Period Hours)					Unused Energy Potential (Million kWh)	Energy Cost (Rs. Billion)
		Actual			Allowed	Extra		
		Planned	Forced	Total				
		1	2	3 = 1+2	4	5 = 3-4	6	7
GENCO II								
TPS Guddu								
1	2016-17	0	100	100	17.4	82.6	506.800	4.155
	2017-18	0	100	100	17.4	82.6	506.810	2.939
2	2016-17	0	100	100	17.4	82.6	506.800	4.155
	2017-18	0	100	100	17.4	82.6	506.810	2.939
4	2016-17	0	100	100	17.4	82.6	1230.800	10.092
	2017-18	0	100	100	17.4	82.6	1230.824	7.138
7	2016-17	23.8	1	24.8	17.4	7.4	58.932	0.471
	2017-18	Within Range						
8	2016-17	16.8	4	20.8	17.4	3.4	26.820	0.214
	2017-18	Within Range						
9	2016-17	41.9	5.3	47.2	33.8	13.4	105.660	0.845
	2017-18	Within Range						
11	2016-17	Within Range						
	2017-18	0	55.6	55.6	14.6	41	466.334	2.424
13	2016-17	0	100	100	16	84	956.800	6.123
	2017-18	0	100	100	16	84	956.820	4.975
3,5,6, 10,12	2016-17	Within Range						
	2017-18	Within Range						
Sub Total							7060.209	46.477
Guddu 747								
14	2016-17	Within Range						
	2017-18	3.8	15.9	19.6	17.4	2.2	47.152	0.198
15	2016-17	Within Range						
	2017-18	1.5	16.1	17.6	17.4	0.2	4.083	0.017
16	2016-17	Within Range						
	2017-18	6.7	31.4	38.1	17.4	20.7	431	1.810
Sub Total							482.239	2.025
Total							7542.448	48.502
GENCO III								
TPS Muzaffargarh								
4	2016-17	8.2	12.5	20.7	17.4	3.3	79.292	0.832
	2017-18	Within Range						
5	2016-17	Within Range						
	2017-18	8.5	13.4	21.9	17.4	4.5	71.830	0.905
6	2016-17	Within Range						
	2017-18	0	18.8	18.8	17.4	1.4	21.944	0.276
1,2,3	2016-17	Within Range						
	2017-18	Within Range						

		Outage Hours (% of Period Hours)					Unused Energy Potential	Energy Cost
Unit	Period	Actual			Allowed	Extra	(Million kWh)	(Rs. Billion)
		Planned	Forced	Total				
		1	2	3 = 1+2	4	5 = 3-4	6	7
Sub Total							173.066	2.014
GTPS Faisalabad								
5,6,7, 8,9	2016-17	Within Range						
	2017-18							
Sub Total							0	0
SPS Faisalabad								
1	2016-17	0	91.5	91.5	17.4	74.1	315.056	3.465
	2017-18	0	100	100	17.4	82.6	350.934	2.702
2	2016-17	Within Range						
	2017-18							
Sub Total							665.990	6.167
CCPP Nandipur								
1	2016-17	44.9	0.4	45.3	18.4	26.9	969.553	7.756
	2017-18	Within Range						
Sub Total							969.553	7.756
Total							1808.609	15.937
Grand Total							9373.003	64.629

**Note:**

- 'Actual Outage Hours' are the outage hours availed by the units/machines of GENCO-I, II & III, as submitted by them in their quarterly performance reports.
- 'Allowed Outage Hours' are the outage hours allowed to the units/machines of GENCO-I, II & III, as specified in their respective Power Purchase Agreements signed with CPPA-G.
- Unused Energy Potential has been worked out by multiplying the extra outage hours availed by the units/machines of GENCO-I, II & III to the net capacity approved by NEPRA in their respective tariff determinations.
- Similarly, the Energy Cost has been calculated by multiplying the unused energy potential to the selling rate of the units/machines of abovementioned GENCOs as worked out from the Energy Procurement Reports submitted by CPPA-G. The details are attached at **Annex II**.

### 3.3 Longer Duration of Standby Mode:

While reviewing the quarterly reports submitted by public sector GENCOs for the FY 2016-17 and 2017-18, it has been observed that a number of units/machines of different power stations of GENCO-I, II & III remained on standby mode for an alarming longer duration, which resulted in the consumption of auxiliary power and a subsequent financial loss of around **Rs. 1.031 Billion** to the national exchequer (**Annex III**).

In view of above, GENCO-I, II & III were asked to submit the reasons of such longer duration of standby mode. In response, following reasons were submitted by abovementioned GENCOs;

- i. Instructions from the system operator (NPCC) due to no demand.
- ii. Fuel Constraints.
- iii. River Water Conductivity.

The details are as under;

**Table 13**

Unit No.	Total Duration of Standby Mode (Hours)		
	FY 2016-17	FY 2017-18	Reasons
GENCO I			
TPS Jamshoro			
1	802	3930	Instructions of the System Operator (NPCC), River Water Conductivity and Shortage of Fuel
2	557	4459	
3	1330	3982	
4	1010	1918	
GTPS Kotri			
3	4104	5812	Non-availability of indigenous gas fuel from SSGC
4	4472	7022	
5	3630	7333	
6	4939	7387	
7	4088	7095	
GENCO II			
TPS Guddu			
3	5773	6478	Non-availability of indigenous gas supply, which is supplied from two different gas fields i.e. Kandhkot and Mari gas field
5	1826	-	
6	2317	-	
7	1833	7	
8	1512	578	
9	65	355	
10	1947	491	
11	3924	577	
12	4339	579	

Unit No.	Total Duration of Standby Mode (Hours)		
	FY 2016-17	FY 2017-18	Reasons
GENCO II			
Guddu 747 CCPP			
15	142	-	Non-availability of indigenous gas supply, which is supplied from two different gas fields i.e. Kandhkot and Mari gas field
GENCO III			
TPS Muzaffargarh			
1	908	3722	No demand from System Operator (NPCC)
2	919	3726	
3	1233	3602	
4	863	3656	
5	1812	4183	
6	2305	4237	
GTPS Faisalabad			
5	6578	7391	No demand from System Operator (NPCC)
6	6670	7327	
7	6626	7453	
8	6581	7727	
9	5874	7407	
SPS Faisalabad			
1	744	-	No demand from System Operator (NPCC)
2	4644	7778	
CCPP Nandipur			
Complex	55	917	No demand from System Operator (NPCC) and Non-availability of Gas Fuel

### 3.4 Reduction in Availability Factor:

According to Performance Standards (Generation) Rules 2009;

$$\text{Availability Factor} = \frac{\text{Available Hours}}{\text{Period Hours}}$$

Where;

**Available Hours** are the sum of Unit Service Hours, Reserve Shutdown Hours and Synchronous Condensing Hours (if applicable); and

**Period Hours** are the sum of Available Hours and Unavailable Hours (total of Planned Outage Hours and Unplanned Outage Hours).

While reviewing the quarterly reports submitted by public sector GENCOs for the FY 2016-17 and 2017-18, it has been observed that the Availability Factor of a number of units/machines of different power stations of GENCO-I, II & III remained lower than that as worked out from their respective Power Purchase Agreements. The same are highlighted in the tables given below;

Table 14.1 (GENCO I)

Table 14.1 (Contd.)				
Unit	Period	Availability Factor (%)		
		Actual	As per PPA	Reduction
TPS Jamshoro				
1	2016-17	81.5	71.1	-
	2017-18	86.6	71.2	-
2	2016-17	65	66.2	1.2
	2017-18	85	73.1	-
3	2016-17	85.7	73.1	-
	2017-18	89.4	73.1	-
4	2016-17	96.7	73.1	-
	2017-18	80.1	73.1	-
GTPS Kotri				
3	2016-17	99.5	82.6	
	2017-18	79.6	82.6	3
4	2016-17	99.8	82.6	
	2017-18	94.5	82.6	
5	2016-17	81.7	82.6	0.9
	2017-18	92.7	82.6	
6	2016-17	96.3	82.6	
	2017-18	99.8	82.6	
7	2016-17	92	82.6	
	2017-18	96.3	82.6	

Table 14.2 (GENCO II)

		Availability Factor (%)		
Unit	Period	Actual	As per PPA	Reduction
		1	2	3 = 1-2
TPS Guddu				
1	2016-17	0	82.6	82.6
	2017-18	0	82.6	82.6
2	2016-17	0	82.6	82.6
	2017-18	0	82.6	82.6
3	2016-17	86.2	82.6	-
	2017-18	98.8	82.6	-
4	2016-17	0	82.6	82.6
	2017-18	0	82.6	82.6
5	2016-17	90.6	86.8	-
	2017-18	94.9	86.8	-
6	2016-17	88	86.8	-
	2017-18	92	86.8	-
7	2016-17	75.2	82.6	7.4
	2017-18	94.1	82.7	-
8	2016-17	79.2	82.6	3.4
	2017-18	84.1	82.7	-
9	2016-17	52.8	66.2	13.4
	2017-18	95.6	82.7	-
10	2016-17	84.7	82.6	-
	2017-18	90.2	82.7	-
11	2016-17	95.8	85.4	-
	2017-18	44.4	85.4	41
12	2016-17	98.6	85.4	-
	2017-18	93.8	85.4	-
13	2016-17	0	84	84
	2017-18	0	84	84
Guddu 747				
14	2016-17	87.1	82.6	-
	2017-18	80.4	82.6	2.2
15	2016-17	88.4	82.6	-
	2017-18	82.4	82.6	0.2
16	2016-17	85.2	82.6	-
	2017-18	61.9	82.6	20.7

Table 14.3 (GENCO III)

		Availability Factor (%)		
Unit	Period	Actual	As per PPA	Reduction
		1	2	3 = 1-2
TPS Muzaffargarh				
1	2016-17	89.4	82.6	-
	2017-18	90.4	82.6	-
2	2016-17	87.4	82.6	-
	2017-18	90.3	82.6	-
3	2016-17	87.5	82.6	-
	2017-18	91.1	82.6	-
4	2016-17	79.3	82.6	3.3
	2017-18	88.8	82.6	-
5	2016-17	83.7	82.6	-
	2017-18	78.1	82.6	4.5
6	2016-17	88	82.6	-
	2017-18	81.2	82.6	1.4
GTPS Faisalabad				
5	2016-17	99.5	88.1	-
	2017-18	97.9	88.1	-
6	2016-17	98.4	88.1	-
	2017-18	94.8	88.1	-
7	2016-17	99.7	88.1	-
	2017-18	99.5	88.1	-
8	2016-17	99.6	88.1	-
	2017-18	98.7	88.1	-
9	2016-17	91.3	82.6	-
	2017-18	98.8	82.6	-
SPS Faisalabad				
1	2016-17	8.5	82.6	74.1
	2017-18	0	82.6	82.6
2	2016-17	87.5	82.6	-
	2017-18	90.9	82.6	-
CCPP Nandipur				
1	2016-17	54.7	81.6	26.9
	2017-18	93.3	81.6	-

### 3.5 Net Capacity Factor:

According to Performance Standards (Generation) Rules 2009,

$$\text{Net Capacity Factor} = \frac{\text{Net Generation}}{\text{Net Capacity} * \text{Period Hours}}$$

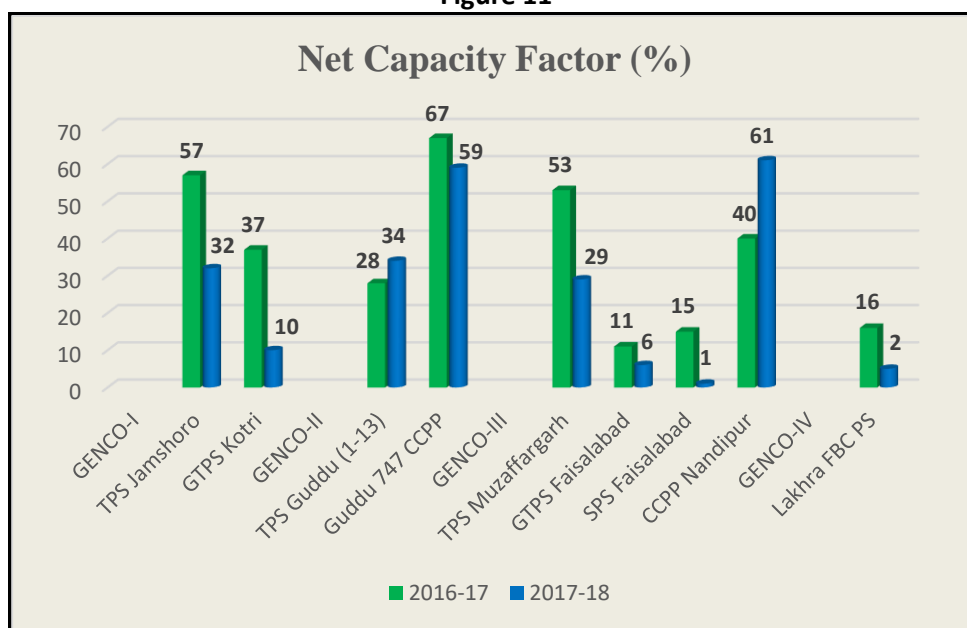
The Net Capacity Factor (%) of different power stations of public sector GENCOs, during the FY 2016-17 and 2017-18, remained as follows;

**Table 15**

S.No.	Power Station	Net Capacity Factor (%)	
		2016-17	2017-18
GENCO I			
1	TPS Jamshoro	57	32
2	GTPS Kotri	37	10
GENCO II			
3	TPS Guddu	28	34
4	Guddu 747	67	59
GENCO III			
5	TPS Muzaffargarh	53	29
6	GTPS Faisalabad	11	6
7	SPS Faisalabad	15	1
8	CCPP Nandipur	40	61
GENCO IV			
9	Lakhra PS	16	2

Unit wise details are attached at **Annex IV**

**Figure 11**



### 3.6 Net Output Factor:

According to Performance Standards (Generation) Rules 2009,

$$\text{Net Output Factor} = \frac{\text{Net Generation}}{\text{Net Capacity} * \text{Service Hours}}$$

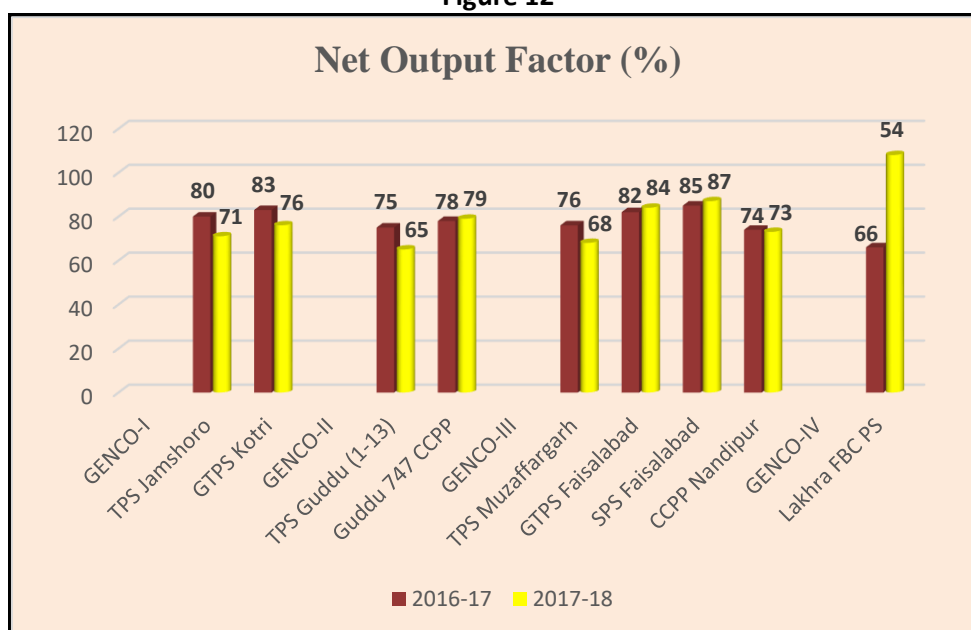
The Net Output Factor (%) of different power stations of public sector GENCOs, during the FY 2016-17 and 2017-18, remained as follows;

**Table 16**

S.No.	Power Station	Net Output Factor (%)	
		2016-17	2017-18
GENCO I			
1	TPS Jamshoro	80	71
2	GTPS Kotri	83	76
GENCO II			
3	TPS Guddu	75	65
4	Guddu 747	78	79
GENCO III			
5	TPS Muzaffargarh	76	68
6	GTPS Faisalabad	82	84
7	SPS Faisalabad	85	87
8	CCPP Nandipur	74	73
GENCO IV			
9	Lakhra PS	66	54

Unit wise details are attached at **Annex IV**

**Figure 12**



### 3.7 Energy Availability Factor:

According to Performance Standards (Generation) Rules 2009;

$$\text{Energy Availability Factor} = \frac{\text{Available Hour} - \text{EPDH} - \text{EUDH}}{\text{Period Hours}}$$

Where;

EPDH = Equivalent Planned Derated Hours

EUDH = Equivalent Unplanned Derated Hours

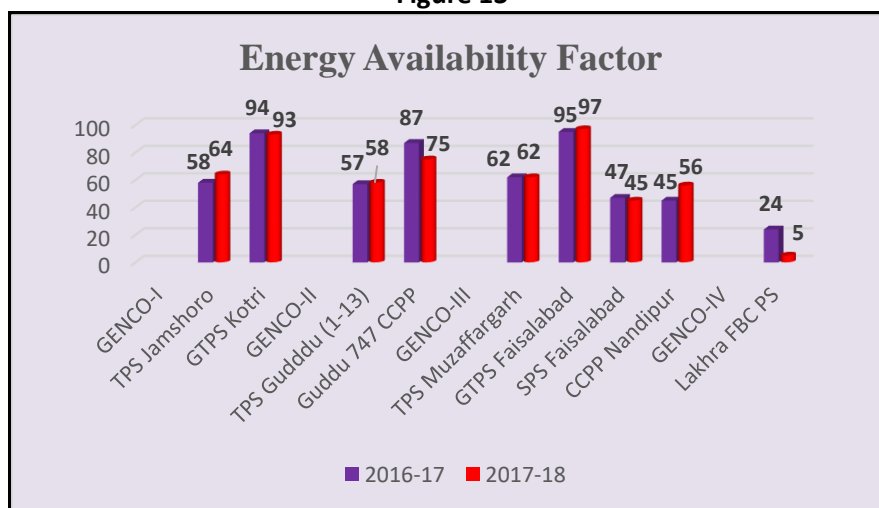
The Energy Availability Factor (%) of different power stations of public sector GENCOs, during the FY 2016-17 and 2017-18, remained as follows;

**Table 17**

Table 17			
S.No.	Power Station	Energy Availability Factor (%)	
		2016-17	2017-18
GENCO I			
1	TPS Jamshoro	58	64
2	GTPS Kotri	94	93
GENCO II			
3	TPS Guddu	57	58
4	Guddu 747	87	75
GENCO III			
5	TPS Muzaffargarh	62	62
6	GTPS Faisalabad	95	97
7	SPS Faisalabad	47	45
8	CCPP Nandipur	45	56
GENCO IV			
9	Lakhra PS	24	5

Unit wise details are attached at **Annex IV**

**Figure 13**



ENERGY LOSS AND SUBSEQUENT FINANCIAL IMPACT DUE TO REDUCTION IN NET CAPACITY (GENCO I)									
TPS JAMSHORO (1*250 + 3*200 = 850 MW)									
Unit	Year	Installed	Capacity (MW)			Service Hours	Energy Loss (Million kWh)	Unit Rate (Rs/kWh)*	Financial Impact (Rs. Billion)
			Net						
			Actual	Approved	Reduction				
			1	2	3 = 2-1				
1	2016-17	250	181.70	182.45	0.75	6336	4.752	9.7	0.046
	2017-18		180.36		2.09	3658	7.646	11.2	0.086
2	2016-17	200	154.16	154.73	0.57	5141	2.930	10.1	0.030
	2017-18		154.21		0.52	2983	1.551	10.4	0.016
3	2016-17	200	154.16	155.36	1.2	6174	7.408	9.1	0.067
	2017-18		154.38		0.98	3853	3.776	10.1	0.038
4	2016-17	200	153.54	156.48	2.94	7464	21.946	9	0.198
	2017-18		153.29		3.19	5098	16.261	9.5	0.154
Overall	2016-17	850		649.02			37.036		0.341
	2017-18				29.235	0.294			
TOTAL							66.270		0.635
GTPS KOTRI (4*25 + 1*44 = 144 MW)									
Unit	Year	Installed	Capacity (MW)			Service Hours	Energy Loss (Million kWh)	Unit Rate (Rs/kWh)*	Financial Impact (Rs. Billion)
			Net						
			Actual	Approved	Reduction				
			1	2	3 = 2-1				
3	2016-17	25	21.98	18	0	4615	0	7.7	0
	2017-18		21.97		0	1162	0	4.4	0
4	2016-17	25	21.98	18	0	4268	0	7.7	0
	2017-18		21.98		0	1257	0	4.4	0
5	2016-17	25	21.79	18	0	3029	0	7.7	0
	2017-18		21.76		0	789	0	4.4	0
6	2016-17	25	21.77	18	0	3666	0	7.7	0
	2017-18		21.76		0	1358	0	4.4	0
7	2016-17	44	38.28	35	0	3971	0	7.7	0
	2017-18		35.09		0	1338	0	4.4	0
Overall	2016-17	144		107			0		0
	2017-18				0	0			
TOTAL							0		0

**NOTE**

\* Unit rate for each machine has been calculated by dividing the total energy cost with the total energy procured by CPPA-G from that machine during a fiscal year.

ENERGY LOSS AND SUBSEQUENT FINANCIAL IMPACT DUE TO REDUCTION IN NET CAPACITY (GENCO II)									
TPS GUDDU (2*110 + 2*210 + 6*100 + 2*136 + 1*143 = 1600 MW)									
Unit	Year	Capacity (MW)							
		Installed	Net			Service Hours	Energy Loss (Million kWh)	Unit Rate (Rs/kWh)*	Financial Impact (Rs. Billion)
			Actual	Approved	Reduction				
			1	2	3 = 2-1				
1	2016-17	110	85	70	0	0	0	0	0
	2017-18		85		0	0	0	0	0
2	2016-17	110	85	70	0	0	0	0	0
	2017-18		85		0	0	0	0	0
3	2016-17	210	168.77	170	1.23	1976	2.430	8.2	0.020
	2017-18		165.22		4.78	2177	10.408	5.8	0.060
4	2016-17	210	180	170	0	0	0	0	0
	2017-18		180		0	0	0	0	0
5	2016-17	100	80.19	85	4.81	6752	32.477	8	0.260
	2017-18		81.49		3.51	8311	29.173	6.8	0.198
6	2016-17	100	80.42	85	4.58	4823	22.089	8	0.177
	2017-18		81.69		3.31	8059	26.677	6.8	0.181
7	2016-17	100	94.35	90	0	5412	0	8	0
	2017-18		93.98		0	8232	0	6.8	0
8	2016-17	100	94.29	90	0	5924	0	8	0
	2017-18		94.11		0	6790	0	6.8	0
9	2016-17	100	94.10	90	0	3877	0	8	0
	2017-18		94.02		0	8018	0	6.8	0
10	2016-17	100	94.07	90	0	5082	0	8	0
	2017-18		93.96		0	7410	0	6.8	0
11	2016-17	136	129.73	130	0.27	4730	1.277	6.4	0.008
	2017-18		129.61		0.39	3316	1.293	5.2	0.007
12	2016-17	136	129.55	130	0.45	4535	2.041	6.4	0.013
	2017-18		129.4		0.6	7639	4.583	5.2	0.024
13	2016-17	143	140	130	0	0	0	6.4	0
	2017-18		140		0	0	0	5.2	0
Overall	2016-17	1655		1400			60.315		0.478
	2017-18						72.134		0.471
TOTAL							132.449		0.948
GUDDU 747 CCPP (2*255.6 + 1*265.5 = 776.7 MW)									
Unit	Year	Capacity (MW)							
		Installed	Net			Service Hours	Energy Loss (Million kWh)	Unit Rate (Rs/kWh)*	Financial Impact (Rs. Billion)
			Actual	Approved	Reduction				
			1	2	3 = 2-1				
14	2016-17	255.6	243	241.72	0	7563	0	4.3	0
	2017-18		243		0	7041	0	4.2	0
15	2016-17	255.6	233.5	241.72	8.22	7677	63.105	4.3	0.271
	2017-18		243		0	7219	0	4.2	0
16	2016-17	265.5	261	237.35	0	7705	0	4.3	0
	2017-18		261		0	5419	0	4.2	0
Overall	2016-17	776.7		720.79			63.105		0.271
	2017-18						0		0
TOTAL							63.105		0.271

**NOTE**

\* Unit rate for each machine has been calculated by dividing the total energy cost with the total energy procured by CPPA-G from that machine during a fiscal year.

ENERGY LOSS AND SUBSEQUENT FINANCIAL IMPACT DUE TO REDUCTION IN NET CAPACITY (GENCO III)									
TPS Muzaffargarh (3*210 + 1*320 + 2*200 = 1350 MW)									
Unit	Year	Installed	Capacity (MW)			Service Hours	Energy Loss (Million kWh)	Unit Rate (Rs/kWh)*	Financial Impact (Rs. Billion)
			Net						
			Actual	Approved	Reduction				
			1	2	3 = 2-1	4	5 = 3*4	6	7 = 5*6
1	2016-17	210	183.86	190	6.14	6919.5	42.486	10.5	0.446
	2017-18		183.52		6.48	4194.3	27.179	12.6	0.342
2	2016-17	210	184.72	182.5	0	6735.0	0	10.5	0
	2017-18		183.84		0	4185.8	0	12.6	0
3	2016-17	210	186.24	183.5	0	6436.3	0	10.5	0
	2017-18		186.28		0	4379.4	0	12.6	0
4	2016-17	320	266.37	272.2	5.83	6085.1	35.476	10.5	0.372
	2017-18		266.7		5.5	4124.9	22.687	12.6	0.286
5	2016-17	200	180.24	181.44	1.2	5528.2	6.634	10.5	0.070
	2017-18		181.58		0	2661.7	0.000	12.6	0
6	2016-17	200	177.84	173.88	0	5405.0	0	10.5	0
	2017-18		179.02		0	2852.2	0	12.6	0
Overall	2016-17	1350		1183.52			84.596		0.888
	2017-18					49.866		0.628	
TOTAL							134.462		1.517
GTPS Faisalabad (4*25 + 1*44 = 144 MW)									
Unit	Year	Installed	Capacity (MW)			Service Hours	Energy Loss (Million kWh)	Unit Rate (Rs/kWh)*	Financial Impact (Rs. Billion)
			Net						
			Actual	Approved	Reduction				
			1	2	3 = 2-1	4	5 = 3*4	6	7 = 5*6
5	2016-17	25	22.86	20	0	2135.8	0	6.4	0
	2017-18		22.83		0	1187.1	0	12.8	0
6	2016-17	25	22.87	20	0	1949.0	0	6.4	0
	2017-18		22.86		0	974.6	0	12.8	0
7	2016-17	25	22.86	20	0	2109.9	0	6.4	0
	2017-18		22.83		0	1267.6	0	12.8	0
8	2016-17	25	22.87	20	0	2145.5	0	6.4	0
	2017-18		22.89		0	922.4	0	12.8	0
9	2016-17	44	36.53	37	0.5	2121.2	0.997	6.4	0.006
	2017-18		37.02		0	1247.3	0	12.8	0
Overall	2016-17	144		117			0.997		0.006
	2017-18					0		0	
TOTAL							0.997		0.006
SPS Faisalabad (2*66 = 132 MW)									
Unit	Year	Installed	Capacity (MW)			Service Hours	Energy Loss (Million kWh)	Unit Rate (Rs/kWh)*	Financial Impact (Rs. Billion)
			Net						
			Actual	Approved	Reduction				
			1	2	3 = 2-1	4	5 = 3*4	6	7 = 5*6
1	2016-17	66	50	48.5	0	0	0	0	0
	2017-18		50		0	0	0	0	0
2	2016-17	66	43.95	48.5	4.55	3024.1	13.760	11	0.151
	2017-18		43.50		5	186.8	0.934	7.7	0.007
Overall	2016-17	132		97			13.760		0.151
	2017-18					0.934		0.007	
TOTAL							14.694		0.159
CCPP Nandipur (425 MW)									
Unit	Year	Installed	Capacity (MW)			Service Hours	Energy Loss (Million kWh)	Unit Rate (Rs/kWh)*	Financial Impact (Rs. Billion)
			Net						
			Actual	Approved	Reduction				
			1	2	3 = 2-1	4	5 = 3*4	6	7 = 5*6
1	2016-17	425	401.83	411.34	9.51	4718.3	44.871	8	0.359
	2017-18		410.03		1.31	7347.1	9.625	8	0.077
TOTAL							54.496		0.436

**NOTE**

\* Unit rate for each machine has been calculated by dividing the total energy cost with the total energy procured by CPPA-G from that machine during a fiscal year.

ENERGY LOSS AND SUBSEQUENT FINANCIAL IMPACT DUE TO REDUCTION IN NET CAPACITY (GENCO IV)									
Lakhra Power Station (3*50 = 150 MW)									
Unit	Year	Capacity (MW)							
		Installed	Net			Service Hours	Energy Loss (Million kWh)	Unit Rate (Rs/kWh)*	Financial Impact (Rs. Billion)
			Actual	Approved	Reduction				
			1	2	3 = 2-1	4	5 = 3*4	6	7 = 5*6
1	2016-17	50	28.4	31.2	2.8	284.5	0.797	4	0.003
	2017-18		25.52		5.68	59.18	0.336	4.8	0.002
2	2016-17	50	28.4	31.2	2.8	3986.0	11.161	4	0.045
	2017-18		25.52		5.68	142.05	0.807	4.8	0.004
3	2016-17	50	-	31.2	REQUIRES REHABILITATION				
	2017-18								
Overall	2016-17	150		93.6		11.957		0.048	
	2017-18					1.143		0.005	
TOTAL							13.100		0.053

**NOTE**

\* Unit rate for each machine has been calculated by dividing the total energy cost with the total energy procured by CPPA-G from that machine during a fiscal year.

UNUSED ENERGY POTENTIAL AND SUBSEQUENT ENERGY COST DUE TO HIGHER OUTAGES (GENCO I)														
TPS JAMSHORO														
Units	Year	Net Capacity as per Tariff (MW)	Period Hours (PH)	Planned Outage Hours (POH)	% of POH w.r.t PH	UnPlanned Outage Hours (UOH)	% of UOH w.r.t PH	Total Outage Hours w.r.t PH (%)	Allowed Limit as Per PPA (%)	Violation of Allowed Limit by (%)	Extra Outage Hours Consumed	Energy Loss (Million kWh)	Unit Rate (Rs./kWh)*	Energy Cost (Rs.Billion)
1	2	3	4	5	6=5/4	7	8=7/4	9=6+8	10	11=9-10	12=11*4	13=12*3	14	15=13*14
1	2016-17	182.45	8760	1013.05	11.6%	608.97	7.0%	18.5%	28.9%	0%	0	0	9.7	0
	2017-18	182.45	8760	1148.32	13.1%	22.87	0.3%	13.4%	28.9%	0%	0	0	11.2	0
2	2016-17	154.73	8760	2184.42	24.9%	877.57	10.0%	35.0%	33.8%	1.2%	102	15.781	10.1	0.159
	2017-18	154.73	8760	1185.12	13.5%	132.84	1.5%	15.0%	26.9%	0%	0	0	10.4	0
3	2016-17	155.36	8760	939.27	10.7%	317.50	3.6%	14.3%	26.9%	0%	0	0	9.1	0
	2017-18	155.36	8760	472.65	5.4%	451.63	5.2%	10.6%	26.9%	0%	0	0	10.1	0
4	2016-17	156.48	8760	88.58	1.0%	197.05	2.2%	3.3%	26.9%	0%	0	0	9	0
	2017-18	156.48	8760	1216.33	13.9%	527.74	6.0%	19.9%	26.9%	0%	0	0	9.5	0
Overall	2016-17	649.02										15.781		0.159
	2017-18											0		0
Total												15.781		0.159
GTPS KOTRI														
Units	Year	Net Capacity as per Tariff (MW)	Period Hours (PH)	Planned Outage Hours (POH)	% of POH w.r.t PH	UnPlanned Outage Hours (UOH)	% of UOH w.r.t PH	Total Outage Hours w.r.t PH (%)	Allowed Limit as Per PPA (%)	Violation of Allowed Limit by (%)	Extra Outage Hours Consumed	Energy Loss (Million kWh)	Unit Rate (Rs./kWh)*	Energy Cost (Rs.Billion)
1	2	3	4	5	6=5/4	7	8=7/4	9=6+8	10	11=9-10	12=11*4	13=12*3	14	15=13*14
3	2016-17	18	8760	0	0%	46.6	0.5%	0.5%	17.4%	0%	0	0	7.7	0
	2017-18	18	8760	0	0%	1785.2	20.4%	20.4%	17.4%	3.0%	261	4.697	4.4	0.021
4	2016-17	18	8760	0	0%	20.4	0.2%	0.2%	17.4%	0%	0	0	7.7	0
	2017-18	18	8760	0	0%	482.0	5.5%	5.5%	17.4%	0%	0	0	4.4	0
5	2016-17	18	8760	0	0%	1605.8	18.3%	18.3%	17.4%	0.9%	82	1.468	7.7	0.011
	2017-18	18	8760	480	5.5%	157.4	1.8%	7.3%	17.4%	0%	0	0	4.4	0
6	2016-17	18	8760	0	0%	320.5	3.7%	3.7%	17.4%	0%	0	0	7.7	0
	2017-18	18	8760	4	0.05%	10.9	0.1%	0.2%	17.4%	0%	0	0	4.4	0
7	2016-17	35	8760	0	0%	701.6	8.0%	8.0%	17.4%	0%	0	0	7.7	0
	2017-18	35	8760	0	0%	327.0	3.7%	3.7%	17.4%	0%	0	0	4.4	0
Overall	2016-17	107										1.468		0.011
	2017-18											4.697		0.021
Total												6.165		0.032

NOTE														
* Unit rate for each machine has been calculated by dividing the total energy cost with the total energy procured by CPPA-G from that machine during a fiscal year.														

UNUSED ENERGY POTENTIAL AND SUBSEQUENT ENERGY COST DUE TO HIGHER OUTAGES (GENCO II)														
TPS GUDDU														
Units	Year	Net Capacity as per Tariff (MW)	Period Hours (PH)	Planned Outage Hours (POH)	% of POH w.r.t PH	UnPlanned Outage Hours (UOH)	% of UOH w.r.t PH	Total Outage Hours w.r.t PH (%)	Allowed Limit as Per PPA (%)	Violation of Allowed Limit by (%)	Extra Outage Hours Consumed	Energy Loss (Million kWh)	Unit Rate (Rs./kWh)*	Energy Cost (Rs.Billion)
1	2	3	4	5	6=5/4	7	8=7/4	9=6+8	10	11=9-10	12=11*4	13=12*3	14	15=13*14
1	2016-17	70	8760	0	0%	8760	100%	100%	17.4%	82.6%	7240	506.800	8.2	4.156
	2017-18	70	8760	0	0%	8760	100%	100%	17.4%	82.7%	7240	506.810	5.8	2.939
2	2016-17	70	8760	0	0%	8760	100%	100%	17.4%	82.6%	7240	506.800	8.2	4.156
	2017-18	70	8760	0	0%	8760	100%	100%	17.4%	82.7%	7240	506.810	5.8	2.939
3	2016-17	170	8760	0	0%	1212	13.8%	13.8%	17.4%	0%	0	0	8.2	0.000
	2017-18	170	8760	0	0%	106	1.2%	1.2%	17.4%	0%	0	0	5.8	0.000
4	2016-17	170	8760	0	0%	8760	100%	100%	17.4%	82.6%	7240	1230.800	8.2	10.093
	2017-18	170	8760	0	0%	8760	100%	100%	17.4%	82.7%	7240	1230.824	5.8	7.139
5	2016-17	85	8760	0	0%	826	9.4%	9.4%	13.2%	0%	0	0	8	0.000
	2017-18	85	8760	0	0%	449	5.1%	5.1%	13.2%	0%	0	0	6.8	0.000
6	2016-17	85	8760	0	0%	1050	12.0%	12.0%	13.2%	0%	0	0	8	0.000
	2017-18	85	8760	0	0%	701	8.0%	8.0%	13.2%	0%	0	0	6.8	0.000
7	2016-17	90	8760	2088.8	23.8%	86	1.0%	24.8%	17.4%	7.5%	655	58.932	8	0.471
	2017-18	90	8760	0	0%	521	5.9%	5.9%	17.4%	0%	0	0	6.8	0.000
8	2016-17	90	8760	1464	16.7%	354	4.0%	20.8%	17.4%	3.4%	298	26.820	8	0.215
	2017-18	90	8760	0	0%	1392	15.9%	15.9%	17.4%	0%	0	0	6.8	0.000
9	2016-17	90	8760	3672	41.9%	462	5.3%	47.2%	33.8%	13.4%	1174	105.660	8	0.845
	2017-18	90	8760	0	0%	387	4.4%	4.4%	17.4%	0%	0	0	6.8	0.000
10	2016-17	90	8760	1073	12.2%	269	3.1%	15.3%	17.4%	0%	0	0	8	0.000
	2017-18	90	8760	0	0%	859	9.8%	9.8%	17.4%	0%	0	0	6.8	0.000
11	2016-17	130	8760	0	0%	367	4.2%	4.2%	14.6%	0%	0	0	6.4	0.000
	2017-18	130	8760	0	0%	4867	55.6%	55.6%	14.6%	40.9%	3587	466.334	5.2	2.425
12	2016-17	130	8760	0	0%	124	1.4%	1.4%	14.6%	0%	0	0	6.4	0.000
	2017-18	130	8760	0	0%	542	6.2%	6.2%	14.6%	0%	0	0	5.2	0.000
13	2016-17	130	8760	0	0%	8760	100%	100%	16.0%	84%	7360	956.800	6.4	6.124
	2017-18	130	8760	0	0%	8760	100%	100%	16.0%	84%	7360	956.820	5.2	4.975
Overall	2016-17	1400										3392.612		26.059
	2017-18											3667.597		20.418
Total												7060.209		46.477
GUDDU 747														
Units	Year	Net Capacity as per Tariff (MW)	Period Hours (PH)	Planned Outage Hours (POH)	% of POH w.r.t PH	UnPlanned Outage Hours (UOH)	% of UOH w.r.t PH	Total Outage Hours w.r.t PH (%)	Allowed Limit as Per PPA (%)	Violation of Allowed Limit by (%)	Extra Outage Hours Consumed	Energy Loss (Million kWh)	Unit Rate (Rs./kWh)*	Energy Cost (Rs.Billion)
1	2	3	4	5	6=5/4	7	8=7/4	9=6+8	10	11=9-10	12=11*4	13=12*3	14	15=13*14
14	2016-17	241.72	8684	561.8	6.5%	559	6.4%	12.9%	17.4%	0%	0	0	4.3	0
	2017-18	241.72	8760	329.66	3.8%	1390	15.9%	19.6%	17.4%	2.2%	195	47.152	4.2	0.198
15	2016-17	241.72	8844	585	6.6%	440	5.0%	11.6%	17.4%	0%	0	0	4.3	0
	2017-18	241.72	8761	134.95	1.5%	1406	16.1%	17.6%	17.4%	0.2%	17	4.083	4.2	0.017
16	2016-17	237.35	9047	739	8.2%	603	6.7%	14.8%	17.4%	0%	0	0	4.3	0
	2017-18	237.35	8760	589.15	6.7%	2751	31.4%	38.1%	17.4%	20.7%	1816	431	4.2	1.810
Overall	2016-17	720.79										0		0
	2017-18											482.239		2.025
Total												482.239		2.025

## NOTE

\* Unit rate for each machine has been calculated by dividing the total energy cost with the total energy procured by CPPA-G from that machine during a fiscal year.

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UNUSED ENERGY POTENTIAL AND SUBSEQUENT ENERGY COST DUE TO HIGHER OUTAGES (GENCO III)														
TPS MUZAFFARGARH														
Units	Year	Net Capacity as per Tariff (MW)	Period Hours (PH)	Planned Outage Hours (POH)	% of POH w.r.t PH	UnPlanned Outage Hours (UOH)	% of UOH w.r.t PH	Total Outage Hours w.r.t PH (%)	Allowed Limit as Per PPA (%)	Violation of Allowed Limit by (%)	Extra Outage Hours Consumed	Energy Loss (Million kWh)	Unit Rate (Rs./kWh)*	Energy Cost (Rs.Billion)
1	2	3	4	5	6=5/4	7	8=7/4	9=6+8	10	11=9-10	12=11*4	13=12*3	14	15=13*14
1	2016-17	190	8760	698.4	8.0%	234.00	2.7%	10.6%	17.4%	0%	0	0	10.5	0
	2017-18	190	8760	543.83	6.2%	301.18	3.4%	9.6%	17.4%	0%	0	0	12.6	0
2	2016-17	182.5	8760	765	8.7%	341.00	3.9%	12.6%	17.4%	0%	0	0	10.5	0
	2017-18	182.5	8760	594	6.8%	254.03	2.9%	9.7%	17.4%	0%	0	0	12.6	0
3	2016-17	183.5	8760	590	6.7%	501.00	5.7%	12.5%	17.4%	0%	0	0	10.5	0
	2017-18	183.5	8760	579.35	6.6%	198.87	2.3%	8.9%	17.4%	0%	0	0	12.6	0
4	2016-17	272.2	8760	720.3	8.2%	1091.00	12.5%	20.7%	17.4%	3.3%	291	79.292	10.5	0.833
	2017-18	272.2	8760	736.95	8.4%	242.01	2.8%	11.2%	17.4%	0%	0	0	12.6	0
5	2016-17	181.44	8760	707	8.1%	717.00	8.2%	16.3%	17.4%	0%	0	0	10.5	0
	2017-18	181.44	8760	744	8.5%	1171.89	13.4%	21.9%	17.4%	4.5%	396	71.830	12.6	0.905
6	2016-17	173.88	8760	645	7.4%	405.00	4.6%	12.0%	17.4%	0%	0	0	10.5	0
	2017-18	173.88	8760	0	0.0%	1646.20	18.8%	18.8%	17.4%	1.4%	126	21.944	12.6	0.276
Overall	2016-17	1183.52										79.292		0.833
	2017-18											93.774		1.182
Total												173.066		2.014
GTPS FASLABAD														
Units	Year	Net Capacity as per Tariff (MW)	Period Hours (PH)	Planned Outage Hours (POH)	% of POH w.r.t PH	UnPlanned Outage Hours (UOH)	% of UOH w.r.t PH	Total Outage Hours w.r.t PH (%)	Allowed Limit as Per PPA (%)	Violation of Allowed Limit by (%)	Extra Outage Hours Consumed	Energy Loss (Million kWh)	Unit Rate (Rs./kWh)*	Energy Cost (Rs.Billion)
1	2	3	4	5	6=5/4	7	8=7/4	9=6+8	10	11=9-10	12=11*4	13=12*3	14	15=13*14
5	2016-17	20	8760	0	0%	45	0.5%	0.5%	11.9%	0%	0	0	6.4	0
	2017-18	20	8760	0	0%	181.75	2.1%	2.1%	11.9%	0%	0	0	12.8	0
6	2016-17	20	8760	0	0%	140	1.6%	1.6%	11.9%	0%	0	0	6.4	0
	2017-18	20	8760	0	0%	458.24	5.2%	5.2%	11.9%	0%	0	0	12.8	0
7	2016-17	20	8760	0	0%	25	0.3%	0.3%	11.9%	0%	0	0	6.4	0
	2017-18	20	8760	0	0%	39.47	0.5%	0.5%	11.9%	0%	0	0	12.8	0
8	2016-17	20	8760	0	0%	35	0.4%	0.4%	11.9%	0%	0	0	6.4	0
	2017-18	20	8760	0	0%	110.83	1.3%	1.3%	11.9%	0%	0	0	12.8	0
9	2016-17	37	8760	744	8.5%	20	0.2%	8.7%	17.4%	0%	0	0	6.4	0
	2017-18	37	8760	0	0%	105.45	1.2%	1.2%	17.4%	0%	0	0	12.8	0
Overall	2016-17	117										0		0
	2017-18											0		0
Total												0		0
SPS FASLABAD														
Units	Year	Net Capacity as per Tariff (MW)	Period Hours (PH)	Planned Outage Hours (POH)	% of POH w.r.t PH	UnPlanned Outage Hours (UOH)	% of UOH w.r.t PH	Total Outage Hours w.r.t PH (%)	Allowed Limit as Per PPA (%)	Violation of Allowed Limit by (%)	Extra Outage Hours Consumed	Energy Loss (Million kWh)	Unit Rate (Rs./kWh)*	Energy Cost (Rs.Billion)
1	2	3	4	5	6=5/4	7	8=7/4	9=6+8	10	11=9-10	12=11*4	13=12*3	14	15=13*14
1	2016-17	48.5	8760	0	0.0%	8016	91.5%	91.5%	17.4%	74.2%	6496	315.056	11	3.466
	2017-18	48.5	8760	0	0.0%	8760	100.0%	100.0%	17.4%	82.6%	7236	350.934	7.7	2.702
2	2016-17	48.5	8760	720	8.2%	372	4.2%	12.5%	17.4%	0%	0	0	11	0
	2017-18	48.5	8760	720	8.2%	74.92	0.9%	9.1%	17.4%	0%	0	0	7.7	0
Overall	2016-17	97										315.056		3.466
	2017-18											350.934		2.702
Total												665.990		6.168
CCPP NANDIPUR														
Units	Year	Net Capacity as per Tariff (MW)	Period Hours (PH)	Planned Outage Hours (POH)	% of POH w.r.t PH	UnPlanned Outage Hours (UOH)	% of UOH w.r.t PH	Total Outage Hours w.r.t PH (%)	Allowed Limit as Per PPA (%)	Violation of Allowed Limit by (%)	Extra Outage Hours Consumed	Energy Loss (Million kWh)	Unit Rate (Rs./kWh)*	Energy Cost (Rs.Billion)
1	2	3	4	5	6=5/4	7	8=7/4	9=6+8	10	11=9-10	12=11*4	13=12*3	14	15=13*14
1	2016-17	411.34	8760	3933.9	44.9%	35	0.4%	45.3%	18.4%	26.9%	2357	969.553	8	7.756
	2017-18	411.34	8760	502.8	5.7%	88	1.0%	6.7%	18.4%	0%	0	0	8	0
Total												969.553		7.756

## NOTE

\* Unit rate for each machine has been calculated by dividing the total energy cost with the total energy procured by CPPA-G from that machine during a fiscal year.

ENERGY LOSS AND SUBSEQUENT FINANCIAL IMPACT DUE TO AUXILIARY CONSUMPTION DURING STANDBY MODE (GENCO I)									
TPS JAMSHORO (1*250 + 3*200 = 850 MW)									
Unit	Year	Capacity (MW)		Auxiliary Consumption during Standby Mode					
		Installed	De-rated	Actual		Standby Hours	Energy Loss (Million kWh)	Unit Rate (Rs/kWh)*	Financial Impact (Rs. Billion)
				%	MW				
		1	2	3		4	5=3*4	6	7=5*6
1	2016-17	250	200	0.45	0.90	802	0.722	5.4	0.004
	2017-18			1.08	2.16	3930	8.490	6.1	0.052
2	2016-17	200	170	0.38	0.65	557	0.360	5.4	0.002
	2017-18			1.5	2.53	4459	11.295	6.1	0.069
3	2016-17	200	170	1.28	2.18	1330	2.893	5.4	0.016
	2017-18			1.04	1.77	3982	7.041	6.1	0.043
4	2016-17	200	170	0.48	0.82	1010	0.824	5.4	0.004
	2017-18			0.94	1.60	1918	3.066	6.1	0.019
Overall	2016-17	850	710				4.799		0.026
	2017-18						29.892		0.182
TOTAL									
GTPS KOTRI (4*25 + 1*44 = 144 MW)									
Unit	Year	Capacity (MW)		Auxiliary Consumption during Standby Mode					
		Installed	De-rated	Actual		Standby Hours	Energy Loss (Million kWh)	Unit Rate (Rs/kWh)*	Financial Impact (Rs. Billion)
				%	MW				
		1	2	3		4	5=3*4	6	7=5*6
3	2016-17	25	22	0.02	0.00	4104	0.018	5.4	0.0001
	2017-18			0.10	0.02	5812	0.128	6.1	0.001
4	2016-17	25	22	0.02	0.00	4472	0.020	5.4	0.0001
	2017-18			0.11	0.02	7022	0.170	6.1	0.001
5	2016-17	25	22	0.04	0.01	3630	0.032	5.4	0.0002
	2017-18			0.28	0.06	7333	0.452	6.1	0.003
6	2016-17	25	22	0.04	0.01	4939	0.043	5.4	0.0002
	2017-18			0.16	0.04	7387	0.260	6.1	0.002
7	2016-17	44	44	0.73	0.32	4088	1.313	5.4	0.007
	2017-18			3.71	1.63	7095	11.581	6.1	0.071
Overall	2016-17	144	132				1.426		0.008
	2017-18						12.591		0.077
TOTAL									

## NOTE

\* Unit rate for each year has been calculated by averaging the Energy Sale Price as mentioned in the monthly Energy Procurement Reports of that year.

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ENERGY LOSS AND SUBSEQUENT FINANCIAL IMPACT DUE TO AUXILIARY CONSUMPTION DURING STANDBY MODE (GENCO II)									
TPS GUDDU (2*110 + 2*210 + 6*100 + 2*136 + 1*143 = 1600 MW)									
Unit	Year	Capacity (MW)		Auxiliary Consumption during Standby Mode					
		Installed	De-rated	Actual		Standby Hours	Energy Loss (Million kWh)	Unit Rate (Rs/kWh)*	Financial Impact (Rs. Billion)
				%	MW				
		1	2	3		4	5=3*4	6	7=5*6
1	2016-17	110	85	0	0	0	0	5.4	0
	2017-18			0	0	0	0	6.1	0
2	2016-17	110	85	0	0	0	0	5.4	0
	2017-18			0	0	0	0	6.1	0
3	2016-17	210	180	0.83	1.49	5773	8.624	5.4	0.046
	2017-18			0.74	1.33	6478	8.628	6.1	0.053
4	2016-17	210	180	0	0	0	0	5.4	0
	2017-18			0	0	0	0	6.1	0
5	2016-17	100	85	0.83	0.71	1826	1.288	5.4	0.007
	2017-18			0	0	0	0	6.1	0
6	2016-17	100	85	1.13	0.96	2317	2.225	5.4	0.012
	2017-18			0	0	0	0	6.1	0
7	2016-17	100	95	0.09	0.09	1833	0.157	5.4	0.001
	2017-18			0	0	7	0	6.1	0
8	2016-17	100	95	0.07	0.07	1512	0.101	5.4	0.001
	2017-18			0.02	0.02	578	0.011	6.1	0.0001
9	2016-17	100	95	0	0	65	0	5.4	0
	2017-18			0.01	0.01	355	0.003	6.1	0.00002
10	2016-17	100	95	0.09	0.09	1947	0.166	5.4	0.001
	2017-18			0.02	0.02	491	0.009	6.1	0.0001
11	2016-17	136	130	0.09	0.12	3925	0.459	5.4	0.002
	2017-18			0.02	0.03	577	0.015	6.1	0.0001
12	2016-17	136	130	0.11	0.14	4339	0.620	5.4	0.003
	2017-18			0.01	0.01	579	0.008	6.1	0.00005
13	2016-17	143	140	0	0	0	0	5.4	0
	2017-18			0	0	0	0	6.1	0
Overall	2016-17	1655	1480				13.641		0.073
	2017-18						8.675		0.053
TOTAL							22.316		0.126
GUDDU 747 CCPP (2*255.6 + 1*265.5 = 776.7 MW)									
Unit	Year	Capacity (MW)		Auxiliary Consumption during Standby Mode					
		Installed	De-rated	Actual		Standby Hours	Energy Loss (Million kWh)	Unit Rate (Rs/kWh)*	Financial Impact (Rs. Billion)
				%	MW				
		1	2	3		4	5=3*4	6	7=5*6
14	2016-17	255.6	243	0	0	0	0	5.4	0
	2017-18			0	0	0	0	6.1	0
15	2016-17	255.6	243	0	0	142	0	5.4	0
	2017-18			0	0	0	0	6.1	0
16	2016-17	265.5	261	0	0	0	0	5.4	0
	2017-18			0	0	0	0	6.1	0
Overall	2016-17	776.7	747				0		0
	2017-18						0		0
TOTAL							0		0

NOTE

\* Unit rate for each year has been calculated by averaging the Energy Sale Price as mentioned in the monthly Energy Procurement Reports of that year.

ENERGY LOSS AND SUBSEQUENT FINANCIAL IMPACT DUE TO AUXILIARY CONSUMPTION DURING STANDBY MODE (GENCO III)									
TPS Muzaffargarh (3*210 + 1*320 + 2*200 = 1350 MW)									
Unit	Year	Capacity (MW)		Auxiliary Consumption during Standby Mode					
		Installed	De-rated	Actual		Standby Hours	Energy Loss (Million kWh)	Unit Rate (Rs/kWh)*	Financial Impact (Rs. Billion)
				%	MW				
		1	2	3		4	5=3*4	6	7=5*6
1	2016-17	210	200	0.48	0.95	908.3	0.867	5.4	0.005
	0.79			1.58	3721.7	5.888	6.1	0.036	
2	2016-17	210	200	0.45	0.89	919.2	0.822	5.4	0.004
	0.41			0.82	3726.2	3.063	6.1	0.019	
3	2016-17	210	200	0.26	0.52	1237.7	0.649	5.4	0.004
	0.33			0.66	3602.4	2.363	6.1	0.014	
4	2016-17	320	300	0.13	0.39	863.2	0.339	5.4	0.002
	0.57			1.72	3656.2	6.285	6.1	0.038	
5	2016-17	200	200	1.02	2.04	1811.7	3.696	5.4	0.02
	2.12			4.24	4182.7	17.735	6.1	0.108	
6	2016-17	200	200	1.24	2.48	2305.4	5.717	5.4	0.031
	2.22			4.44	4237.1	18.813	6.1	0.115	
Overall	2016-17	1350	1300				12.089		0.065
	2017-18						54.146		0.330
TOTAL							66.235		0.396
GTPS Faisalabad (4*25 + 1*44 = 144 MW)									
Unit	Year	Capacity (MW)		Auxiliary Consumption during Standby Mode					
		Installed	De-rated	Actual		Standby Hours	Energy Loss (Million kWh)	Unit Rate (Rs/kWh)*	Financial Impact (Rs. Billion)
				%	MW				
		1	2	3		4	5=3*4	6	7=5*6
5	2016-17	25	23	0.30	0.07	6578	0.448	5.4	0.002
	0.64			0.15	7391.1	1.095	6.1	0.007	
6	2016-17	25	23	0.33	0.08	6670.2	0.511	5.4	0.003
	0.77			0.18	7327.2	1.304	6.1	0.008	
7	2016-17	25	23	0.31	0.07	6625.8	0.479	5.4	0.003
	0.58			0.13	7452.9	0.998	6.1	0.006	
8	2016-17	25	23	0.28	0.06	6581.3	0.424	5.4	0.002
	0.80			0.18	7726.8	1.416	6.1	0.009	
9	2016-17	44	42	0.74	0.31	5874.2	1.831	5.4	0.010
	4.61			1.93	7407.3	14.326	6.1	0.087	
Overall	2016-17	144	134				3.692		0.020
	2017-18						19.140		0.117
TOTAL							22.831		0.137
SPS Faisalabad (2*66 = 132 MW)									
Unit	Year	Capacity (MW)		Auxiliary Consumption during Standby Mode					
		Installed	De-rated	Actual		Standby Hours	Energy Loss (Million kWh)	Unit Rate (Rs/kWh)*	Financial Impact (Rs. Billion)
				%	MW				
		1	2	3		4	5=3*4	6	7=5*6
1	2016-17	66	50	1.20	0.60	744	0.446	5.4	0.002
	0			0	0	0	6.1	0	
2	2016-17	66	50	1.20	0.60	4643.7	2.786	5.4	0.015
	1.25			0.63	7777.9	4.861	6.1	0.030	
Overall	2016-17	132	100				3.233		0.017
	2017-18						4.861		0.030
TOTAL							8.094		0.047
CCPP Nandipur (425 MW)									
Unit	Year	Capacity (MW)		Auxiliary Consumption during Standby Mode					
		Installed	De-rated	Actual		Standby Hours	Energy Loss (Million kWh)	Unit Rate (Rs/kWh)*	Financial Impact (Rs. Billion)
				%	MW				
		1	2	3		4	5=3*4	6	7=5*6
1	2016-17	425	425	1.98	8.42	55	0.463	5.4	0.0025
	1.28			5.44	917.1	4.989	6.1	0.030	
TOTAL							5.452		0.033

**NOTE**

\* Unit rate for each year has been calculated by averaging the Energy Sale Price as mentioned in the monthly Energy Procurement Reports of that year.

ENERGY LOSS AND SUBSEQUENT FINANCIAL IMPACT DUE TO AUXILIARY CONSUMPTION DURING DURING STANDBY MODE (GENCO IV)									
Lakhra Power Station (3*50 = 150 MW)									
Unit	Year	Capacity (MW)		Auxiliary Consumption during Standby Mode					
		Installed	De-rated	Actual		Standby Hours	Energy Loss (Million kWh)	Unit Rate (Rs/kWh)*	Financial Impact (Rs. Billion)
				%	MW				
		1	2	3		4	5=3*4	6	7=5*6
1	2016-17	50	40	0	0	0	0	5.4	0
	2017-18			0	0	0	0	6.1	0
2	2016-17	50	40	0	0	0	0	5.4	0
	2017-18			0	0	0	0	6.1	0
3	2016-17	50	40						
	2017-18								
Overall	2016-17	150	120				0		0
	2017-18						0		0
TOTAL							0		0

**NOTE**

\* Unit rate for each year has been calculated by averaging the Energy Sale Price as mentioned in the monthly Energy Procurement Reports of that year.

Unit No.	Net Capacity Factor (%)		Net Output Factor (%)		Energy Availability Factor (%)	
	FY 2016-17	FY 2017-18	FY 2016-17	FY 2017-18	FY 2016-17	FY 2017-18
<b>GENCO I</b>						
<b>TPS JAMSHORO</b>						
1	52	26	71	63	61	72
2	49	25	84	75	56	75
3	57	32	81	74	73	77
4	72	43	84	74	85	63
<b>GTPS KOTRI</b>						
3	55	14	104	103	100	80
4	42	13	85	90	100	95
5	33	8	97	88	76	93
6	36	13	86	85	98	100
7	27	7	61	45	92	96
<b>GENCO II</b>						
<b>TPS GUDDU</b>						
1	0	0	0	0	0	0
2	0	0	0	0	0	0
3	14	17	63	70	88	99
4	0	0	0	0	0	0
5	38	57	50	60	95	82
6	36	32	65	35	79	76
7	61	99	99	105	82	90
8	62	6	91	8	85	83
9	57	94	129	103	44	94
10	59	85	102	100	78	86
11	38	27	71	71	99	44
12	33	65	65	74	101	94
13	0	0	0	0	0	0
<b>GUDDU 747 CCPP</b>						
14	71	67	82	83	87	80
15	68	69	79	83	88	82
16	62	43	73	69	85	62
<b>GENCO III</b>						
<b>TPS MUZAFFARGARH</b>						
1	62	36	79	75	60	67
2	63	36	81	76	57	69
3	58	39	79	77	60	71
4	53	29	77	62	78	89
5	43	17	68	57	53	52
6	41	18	66	54	66	65

Unit No.	Net Capacity Factor (%)		Net Output Factor (%)		Energy Availability Factor (%)	
	FY 2016-17	FY 2017-18	FY 2016-17	FY 2017-18	FY 2016-17	FY 2017-18
<b>GENCO III</b>						
<b>GTPS FAISALABAD</b>						
5	19	10	77	73	97	97
6	17	8	76	72	97	94
7	18	11	74	76	97	99
8	19	8	80	79	98	98
9	15	10	61	67	90	98
<b>SPS FAISALABAD</b>						
1	0	0%	0	0	8	0
2	29	2%	85	80	86	91
<b>CCPP NANDIPUR</b>						
Complex	40	61	74	73	45	56
<b>GENCO IV</b>						
<b>LAKHRA POWER STATION</b>						
1	2	1	63	54	3	3
2	30	3	66	54	46	6
3	REQUIRES REHABILITATION					