

**BHUTAN POWER SYSTEM OPERATOR LOAD-GENERATION BALANCE REPORT**

**Maximum Load/Demand till Date**

<b>Date:</b>	<b>November 10, 2021</b>
<b>Hours:</b>	<b>19:00 Hours</b>

<b>Date</b>	<b>Time</b>	<b>Load(MW)</b>
10-Nov-21	19:00hrs	434.04MW

Sl. No.	Hydropower Plant	Unit	MW	Transmission Lines and Elements	Load (MW)	Sign	Remarks
1	1020MW THP	Unit- I	0.00	400kV THP - Siliguri Line - I	0.00		Unit-I under AMP. Unit-II on standby Unit V under shutdown 400kV THP-Siliguri line I under breakdown. 400kV THP-MAL line under Annual Maintenance .
		Unit- II	0.00	400kV THP - Siliguri Line - II	271.00	+	
		Unit- III	180.20	400kV THP - Siliguri Line- IV	258.00	+	
		Unit- IV	179.00	400kV THP - Malbase Line - III	0.00		
		Unit- V	0.00	400kV Malbase - Siliguri Line	-38.07	-	
		Unit- VI	179.50	-	-	-	
		<b>Total</b>	<b>538.70</b>	<b>Auxiliary Consumption &amp; Transformation Losses at Gen. end</b>	<b>1.801%</b>		
2	720MW MHP	Unit-I	100.24	400kV MHP - Jigmeling Line - I	114.07	+	Unit-II on Standby. Unit IV under Annual Maintenance. 400kV MHP-JLG Line II & IV on standby. 132kV MHP_Yurmoo line I & II not in service. 400kV JLG_ALI Line I (Interim) on standby. JLG_ALI Line II (Direct) opened (Both end).
		Unit-II	0.00	400kV MHP - Jigmeling Line - II	0.00		
		Unit-III	130.41	400kV MHP - Jigmeling Line - III	115.02	+	
		Unit-IV	0.00	400kV MHP - Jigmeling Line - IV	0.00		
		-	-	132kV MHP - Yurmo Line - I	0.00		
		-	-	132kV MHP - Yurmo Line - II	0.00		
		-	-	500MVA, 400/220kV ICT at Jigmeling (HV)	52.92	+	
		-	-	400kV Jigmeling - Alipurduar Line - I (Interim)	0.00		
		-	-	400kV Jigmeling - Alipurduar Line - II (Interim)	68.36	+	
		-	-	400kV Jigmeling - Alipurduar Line - I (Direct)	104.73	+	
		-	-	400kV Jigmeling - Alipurduar Line - II (Direct)	0.00		
		-	-	80MVA, 220/132kV ICT - I (HV)	25.09	+	
		-	-	80MVA, 220/132kV ICT - II (HV)	25.49	+	
-	-	220kV Tsirang - Jigmeling Line	8.06	+			
-	-	132kV Gelephu - Salakati Line	5.40	+			
		<b>Total</b>	<b>230.65</b>	<b>Auxiliary Consumption &amp; Transformation Losses at Gen. end</b>	<b>0.676%</b>		
3	336MW CHP	Unit- I	85.97	220kV CHP - Birpara Line- I	39.37	+	
		Unit- II	85.27	220kV CHP - Birpara Line- II	39.17	+	
		Unit- III	87.67	220kV CHP - Malbase Line- III	103.83	+	
		Unit- IV	0.00	220kV CHP - Semtokha Line- IV	50.09	+	
		-	-	220kV Malbase - Birpara Line	-15.88	-	
		-	-	66kV CHP - Chumdo Line	17.60	+	
		-	-	66kV CHP - Gedu Line	4.81	+	
		-	-	3x3MVA, 66/11kV TFR	1.83	+	
		<b>Total</b>	<b>258.91</b>	<b>Auxiliary Consumption &amp; Transformation Losses at Gen. end</b>	<b>0.854%</b>		
4	24MW BHP (U/S)	Unit- I	8.60	220kV BHP - Semtokha Line	69.00	+	
		Unit- II	8.50	66kV BHP - Lobeysa Line	29.70	+	
		<b>Total</b>	<b>17.10</b>	220kV BHP - Tsirang Line	-49.41	-	
5	40MW BHP (L/S)	Unit- I	16.60	5MVA, 66/11kV TFR	0.65	+	
		Unit- II	16.50	30MVA ICT, 220/66kV (HV)	13.70	+	
		<b>Total</b>	<b>33.10</b>	<b>Auxiliary Consumption &amp; Transformation Losses at Gen. end</b>	<b>0.518%</b>		
6	126MW DHP	Unit-I	0.00	220kV DHP - Tsirang Line	61.25	+	Unit II on standby
		Unit-II	62.01	220kV DHP - Dagapela Line	0.00		
		-	-	220kV Jigmeling - Dagapela Line	10.54	+	
		-	-	5MVA, 220/33kV TFR	0.30	+	
		<b>Total</b>	<b>62.01</b>	<b>Auxiliary Consumption &amp; Transformation Losses at Gen. end</b>	<b>0.742%</b>		
7	60MW KHP	Unit- I	13.50	132kV KHP - Nangkhon Line	21.15	+	Unit II on standby. 5 MVA transformer under maintenance.
		Unit-II	0.00	132kV KHP - Kilikhar Line	18.98	+	
		Unit- III	13.58	5MVA, 132/11kV TFR	0.00		
		Unit- IV	13.60	132kV Motanga - Rangia Line	10.83	+	
		<b>Total</b>	<b>40.68</b>	<b>Auxiliary Consumption &amp; Transformation Losses at Gen. end</b>	<b>1.352%</b>		

**Note: Generation-Load Summary (MW) for November 10, 2021 at 19:00hrs.**

Sl. No	Region	Total Generation (MW)	Total Load [Generation - Export (MW)]	Total Load [Feeder Summation (MW)]	Total Export/Import (MW, %)	Auxiliary Consumption & Transformation Losses (MW) at Generator end.
1	Western Grid	909.82	348.17	346.08	553.59	2.09
2	Eastern Grid	271.33	90.07	87.96	189.32	2.11
	<b>Total</b>	<b>1,181.15</b>	<b>438.24</b>	<b>434.04</b>	<b>742.91</b>	<b>4.20</b>

**Note: Generation-Load Summary for November 10, 2020 at 19:00hrs.**

Sl. No	Region	Total Generation (MW)	Total Load [Generation - Export (MW)]	Total Load [Feeder Summation (MW)]	Total Export/Import (MW)	Auxiliary Consumption & Transformation Losses
1	Western Grid	745.74	225.25	216.88	474.16	8.37
2	Eastern Grid	296.73	69.27	66.53	273.79	2.74
	<b>Total</b>	<b>1,042.47</b>	<b>294.52</b>	<b>283.41</b>	<b>747.95</b>	<b>11.11</b>

**NOTE-BHP, MHP,KHP and Rangia data collected from site**

1. The Instantaneous load balance is calculated as (Total generation - (Total export-Import) - Total domestic load) do not tend towards zero. This could be due to the following reasons:

- i) Not all the meters are digital and nor are all the meter at all locations can be read at same time (say 9:00hrs) due to many meter to be read manually.
- ii) The clocks of all the locations are not synchronized.

2. This report is generated to give an idea of the generation & load flow for the system at a particular instant.

**BHUTAN POWER SYSTEM OPERATOR LOAD-GENERATION BALANCE REPORT**

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<b>Date:</b>	<b>November 11, 2021</b>
<b>Hours:</b>	<b>09:00 Hours</b>

<b>Date</b>	<b>Time</b>	<b>Load(MW)</b>
10-Nov-21	19:00hrs	434.04MW

Sl. No.	Hydropower Plant	Unit	MW	Transmission Lines and Elements	Load (MW)	Sign	Remarks
1	1020MW THP	Unit- I	0.00	400kV THP - Siliguri Line - I	0.00		Unit-I under AMP. Unit-V under breakdown. 400kV THP-Siliguri line I under breakdown. 400kV THP-MAL line under Annual Maintenance .
		Unit- II	99.13	400kV THP - Siliguri Line - II	250.21	+	
		Unit- III	138.91	400kV THP - Siliguri Line- IV	242.04	+	
		Unit- IV	119.55	400kV THP - Malbase Line - III	0.00		
		Unit- V	0.00	400kV Malbase - Siliguri Line	-28.61	-	
		Unit- VI	139.42	-	-	-	
		<b>Total</b>	<b>497.01</b>	<b>Auxiliary Consumption &amp; Transformation Losses at Generator end</b>	<b>0.958%</b>		
2	720MW MHP	Unit-I	101.88	400kV MHP - Jigmeling Line - I	115.50	+	Unit II on Standby Unit IV under Annual Maintenance. 400kV MHP-JLG Line II & IV on standby. 132kV MHP_Yurmoo line I & II not in service. 400kV JLG_ALI Line I (Interim) on standby. JLG_ALI Line II (Direct) opened (Both end).
		Unit-II	0.00	400kV MHP - Jigmeling Line - II	0.00		
		Unit-III	130.30	400kV MHP - Jigmeling Line - III	116.30	+	
		Unit-IV	0.00	400kV MHP - Jigmeling Line - IV	0.00		
		-	-	132kV MHP - Yurmo Line - I	0.00		
		-	-	132kV MHP - Yurmo Line - II	0.00		
		-	-	500MVA, 400/220kV ICT at Jigmeling (HV)	33.20	+	
		-	-	400kV Jigmeling - Alipurduar Line - I (Interim)	0.00		
		-	-	400kV Jigmeling - Alipurduar Line - II (Interim)	76.36	+	
		-	-	400kV Jigmeling - Alipurduar Line - I (Direct)	117.71	+	
		-	-	400kV Jigmeling - Alipurduar Line - II (Direct)	0.00		
		-	-	80MVA, 220/132kV ICT - I (HV)	19.45	+	
		-	-	80MVA, 220/132kV ICT - II (HV)	19.76	+	
		-	-	220kV Tsirang - Jigmeling Line	15.80	+	
-	-	132kV Gelephu - Salakati Line	9.56	+			
<b>Total</b>	<b>232.18</b>	<b>Auxiliary Consumption &amp; Transformation Losses at Generator end</b>	<b>0.164%</b>				
3	336MW CHP	Unit- I	85.68	220kV CHP - Birpara Line- I	40.69	+	Unit-IV standby.
		Unit- II	85.31	220kV CHP - Birpara Line- II	40.59	+	
		Unit- III	87.77	220kV CHP - Malbase Line- III	116.65	+	
		Unit- IV	0.00	220kV CHP - Semtokha Line- IV	39.00	+	
		-	-	220kV Malbase - Birpara Line	-23.35	-	
		-	-	66kV CHP - Chumdo Line	13.57	+	
		-	-	66kV CHP - Gedu Line	4.80	+	
		-	-	3x3MVA, 66/11kV TFR	1.20	+	
		<b>Total</b>	<b>258.76</b>	<b>Auxiliary Consumption &amp; Transformation Losses at Generator end</b>	<b>0.873%</b>		
4	24MW BHP (U/S)	Unit- I	8.50	220kV BHP - Semtokha Line	63.80	+	
		Unit- II	8.50	66kV BHP - Lobeysa Line	26.70	+	
		<b>Total</b>	<b>17.00</b>	220kV BHP - Tsirang Line	-41.25	-	
5	40MW BHP (L/S)	Unit- I	16.40	5MVA, 66/11kV TFR	0.43	+	
		Unit- II	16.30	30MVA ICT, 220/66kV (HV)	10.90	+	
		<b>Total</b>	<b>32.70</b>	<b>Auxiliary Consumption &amp; Transformation Losses at Generator end</b>	<b>0.040%</b>		
6	126MW DHP	Unit-I	0.00	220kV DHP - Tsirang Line	60.74	+	Unit I on standby. 220kV DHP_Dagapela Line on standby.
		Unit-II	60.97	220kV DHP - Dagapela Line	0.00		
		-	-	220kV Jigmeling - Dagapela Line	9.81	+	
		-	-	5MVA, 220/33kV TFR	0.20	+	
		<b>Total</b>	<b>60.97</b>	<b>Auxiliary Consumption &amp; Transformation Losses at Generator end</b>	<b>0.049%</b>		
7	60MW KHP	Unit- I	13.72	132kV KHP - Nangkhon Line	24.24	+	Unit I on standby. 5 MVA transformer under maintenance.
		Unit-II	0.00	132kV KHP - Kilikhar Line	16.58	+	
		Unit- III	13.78	5MVA, 132/11kV TFR	0.00		
		Unit- IV	13.79	132kV Motanga - Rangia Line	9.46	+	
		<b>Total</b>	<b>41.29</b>	<b>Auxiliary Consumption &amp; Transformation Losses at Generator end</b>	<b>1.138%</b>		

**Note: Generation-Load Summary (MW) for November 11, 2021 at 09:00hrs.**

Sl. No	Region	Total Generation (MW)	Total Load [Generation - Export (MW)]	Total Load [Feeder Summation (MW)]	Total Export/Import (MW)	Auxiliary Consumption & Transformation Losses (MW) at Generator end.
1	Western Grid	866.44	329.07	331.81	521.57	-2.74
2	Eastern Grid	273.47	76.18	75.33	213.09	0.85
	<b>Total</b>	<b>1,139.91</b>	<b>405.25</b>	<b>407.14</b>	<b>734.66</b>	<b>-1.89</b>

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Sl. No	Region	Total Generation (MW)	Total Load [Generation - Export (MW)]	Total Load [Feeder Summation (MW)]	Total Export/Import (MW)	Auxiliary Consumption & Transformation Losses
1	Western Grid	605.07	188.83	179.99	374.76	8.84
2	Eastern Grid	282.56	43.66	41.39	280.38	2.27
	<b>Total</b>	<b>887.63</b>	<b>232.49</b>	<b>221.38</b>	<b>655.14</b>	<b>11.11</b>

**NOTE-BHP,MHPA & Rangia data collected from site.**

1. The Instantaneous load balance is calculated as (Total generation - (Total export-Import) - Total domestic load) do not tend towards zero. This could be due to the following reasons:

- i) Not all the meters are digital and nor are all the meter at all locations can be read at same time (say 9:00hrs) due to many meter to be read manually.
- ii) The clocks of all the locations are not synchronized.

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