

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

**Coincidental Maximum Load**

**Date:** September 28, 2022  
**Hours:** 19:00 Hours

Date	Time	Load(MW)
30-Aug-22	19:23 hrs	536.69

Sl. No.	Hydropower Plant	Unit	MW	Transmission Lines and Elements	Load (MW)	Remarks
1	1020MW THP	Unit- I	185.43	400kV THP - Siliguri Line - I	188.43	
		Unit- II	185.61	400kV THP - Siliguri Line - II	187.85	
		Unit- III	108.53	400kV THP - Siliguri Line- IV	183.35	
		Unit- IV	79.63	400kV THP - Malbase Line - III	304.96	
		Unit- V	127.27	400kV Malbase - Siliguri Line	157.57	
		Unit- VI	186.10	-	-	
		<b>Total</b>	<b>872.57</b>	<b>Auxiliary Consumption &amp; Transformation Losses at Generator end</b>	<b>0.91%</b>	
2	720MW MHP	Unit-I	140.16	400kV MHP - Jigmeling Line - I	236.34	400kV MHP-JLG Line II & IV on Standby. 132kV MHP_Yurmo line I not in service. 400kV JLG_ALI Line II (Interim) on Standby.
		Unit-II	140.11	400kV MHP - Jigmeling Line - II	0.00	
		Unit-III	135.43	400kV MHP - Jigmeling Line - III	237.76	
		Unit-IV	150.56	400kV MHP - Jigmeling Line - IV	0.00	
		-	-	132kV MHP - Yurmo Line - I	0.00	
		-	-	132kV MHP - Yurmo Line - II	87.27	
		-	-	500MVA, 400/220kV ICT at Jigmeling (HV)	70.69	
		-	-	400kV Jigmeling - Alipurduar Line - I (Interim)	100.01	
		-	-	400kV Jigmeling - Alipurduar Line - II (Interim)	0.00	
		-	-	400kV Jigmeling - Alipurduar Line - I (Direct)	149.55	
		-	-	400kV Jigmeling - Alipurduar Line - II (Direct)	147.78	
		-	-	80MVA, 220/132kV ICT - I (HV)	19.47	
		-	-	80MVA, 220/132kV ICT - II (HV)	19.83	
		-	-	220kV Tsirang - Jigmeling Line	-36.98	
-	-	132kV Gelephu - Salakati Line	22.40			
<b>Total</b>	<b>566.26</b>	<b>Auxiliary Consumption &amp; Transformation Losses at Generator end</b>	<b>0.86%</b>			
3	336MW CHP	Unit- I	0.00	220kV CHP - Birpara Line- I	0.00	All CHP units and both 220kV CHP_Birpara lines tripped at 18:37hrs.
		Unit- II	0.00	220kV CHP - Birpara Line- II	0.00	
		Unit- III	0.00	220kV CHP - Malbase Line- III	-6.38	
		Unit- IV	0.00	220kV CHP - Semtokha Line- IV	-9.72	
		-	-	220kV Malbase - Birpara Line	4.69	
		-	-	66kV CHP - Chumdo Line	13.00	
		-	-	66kV CHP - Gedu Line	1.27	
		-	-	3x3MVA, 66/11kV TFR	1.40	
<b>Total</b>	<b>0.00</b>	<b>Auxiliary Consumption &amp; Transformation Losses at Generator end</b>	<b>0.00%</b>			
4	24MW BHP (U/S)	Unit- I	11.30	220kV BHP - Semtokha Line	77.80	
		Unit- II	11.00	66kV BHP - Lobeysa Line	19.59	
		<b>Total</b>	<b>22.30</b>	220kV BHP - Tsirang Line	-35.25	
5	40MW BHP (L/S)	Unit- I	20.40	5MVA, 66/11kV TFR	0.73	
		Unit- II	20.50	30MVA ICT, 220/66kV (HV)	-1.47	
		<b>Total</b>	<b>40.90</b>	<b>Auxiliary Consumption &amp; Transformation Losses at Generator end</b>	<b>0.52%</b>	
6	126MW DHP	Unit-I	34.33	220kV DHP - Tsirang Line	0.00	220kV DHP_Tsirang Line on Standby.
		Unit-II	34.01	220kV DHP - Dagapela Line	67.89	
		-	-	220kV Jigmeling - Dagapela Line	-5.18	
		-	-	5MVA, 220/33kV TFR	0.44	
<b>Total</b>	<b>68.34</b>	<b>Auxiliary Consumption &amp; Transformation Losses at Gen. end</b>	<b>0.01%</b>			
7	60MW KHP	Unit- I	16.53	132kV KHP - Nangkhor Line	34.75	
		Unit-II	16.67	132kV KHP - Kilikhar Line	30.12	
		Unit- III	16.56	5MVA, 132/11kV TFR	0.80	
		Unit- IV	16.52	132kV Motanga - Rangia Line	59.07	
		<b>Total</b>	<b>66.28</b>	<b>Auxiliary Consumption &amp; Transformation Losses at Generator end</b>	<b>0.92%</b>	

**Note: Generation-Load Summary (MW) for September 28, 2022 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)
1	Western Grid	1,004.11	314.02	305.27	721.89	8.75
2	Eastern Grid	632.54	121.93	116.43	478.81	5.50
<b>Total</b>		<b>1,636.65</b>	<b>435.95</b>	<b>421.70</b>	<b>1,200.70</b>	<b>14.25</b>

**Note: Generation-Load Summary for September 28, 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)
1	Western Grid	1,447.49	315.31	310.74	1,120.13	4.57
2	Eastern Grid	616.95	71.88	67.57	557.12	4.31
<b>Total</b>		<b>2,064.44</b>	<b>387.19</b>	<b>378.31</b>	<b>1,677.25</b>	<b>8.88</b>

**NOTE- All data collected from site.**

1. The Instantaneous load balance,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**

**Coincidental Maximum Load**

**Date:** September 29, 2022  
**Hours:** 09:00 Hours

Date	Time	Load(MW)
30-Aug-22	19:23 hrs	536.69

Sl. No.	Hydropower Plant	Unit	MW	Transmission Lines and Elements	Load (MW)	Remarks
1	1020MW THP	Unit- I	185.44	400kV THP - Siliguri Line - I	210.54	
		Unit- II	157.10	400kV THP - Siliguri Line - II	209.53	
		Unit- III	79.82	400kV THP - Siliguri Line- IV	204.23	
		Unit- IV	79.44	400kV THP - Malbase Line - III	243.77	
		Unit- V	187.18	400kV Malbase - Siliguri Line	192.06	
		Unit- VI	186.04	-	-	
		<b>Total</b>	<b>875.02</b>	<b>Auxiliary Consumption &amp; Transformation Losses at Generator end</b>	<b>0.79%</b>	
2	720MW MHP	Unit-I	197.74	400kV MHP - Jigmeling Line - I	319.13	400kV MHP-JLG Line II & IV on Standby. 132kV MHP_Yurmoo line I not in service. 400kV JLG_ALI Line II (Interim) on Standby.
		Unit-II	197.69	400kV MHP - Jigmeling Line - II	0.00	
		Unit-III	135.40	400kV MHP - Jigmeling Line - III	320.98	
		Unit-IV	196.44	400kV MHP - Jigmeling Line - IV	0.00	
		-	-	132kV MHP - Yurmo Line - I	0.00	
		-	-	132kV MHP - Yurmo Line - II	80.72	
		-	-	500MVA, 400/220kV ICT at Jigmeling (HV)	14.14	
		-	-	400kV Jigmeling - Alipurduar Line - I (Interim)	154.11	
		-	-	400kV Jigmeling - Alipurduar Line - II (Interim)	0.00	
		-	-	400kV Jigmeling - Alipurduar Line - I (Direct)	231.63	
		-	-	400kV Jigmeling - Alipurduar Line - II (Direct)	232.80	
		-	-	80MVA, 220/132kV ICT - I (HV)	17.79	
		-	-	80MVA, 220/132kV ICT - II (HV)	18.10	
		-	-	220kV Tsirang - Jigmeling Line	-7.14	
-	-	132kV Gelephu - Salakati Line	26.79			
<b>Total</b>	<b>727.27</b>	<b>Auxiliary Consumption &amp; Transformation Losses at Generator end</b>	<b>0.89%</b>			
3	336MW CHP	Unit- I	91.77	220kV CHP - Birpara Line- I	75.64	
		Unit- II	91.17	220kV CHP - Birpara Line- II	75.38	
		Unit- III	90.94	220kV CHP - Malbase Line- III	128.98	
		Unit- IV	75.44	220kV CHP - Semtokha Line- IV	49.23	
		-	-	220kV Malbase - Birpara Line	22.77	
		-	-	66kV CHP - Chumdo Line	13.62	
		-	-	66kV CHP - Gedu Line	5.16	
		-	-	3x3MVA, 66/11kV TFR	0.75	
<b>Total</b>	<b>349.32</b>	<b>Auxiliary Consumption &amp; Transformation Losses at Generator end</b>	<b>0.16%</b>			
4	24MW BHP (U/S)	Unit- I	12.20	220kV BHP - Semtokha Line	46.10	
		Unit- II	12.00	66kV BHP - Lobeysa Line	24.50	
		<b>Total</b>	<b>24.20</b>	220kV BHP - Tsirang Line	-5.79	
5	40MW BHP (L/S)	Unit- I	20.50	5MVA, 66/11kV TFR	0.37	
		Unit- II	21.10	30MVA ICT, 220/66kV (HV)	1.25	
		<b>Total</b>	<b>41.60</b>	<b>Auxiliary Consumption &amp; Transformation Losses at Generator end</b>	<b>0.94%</b>	
6	126MW DHP	Unit-I	45.41	220kV DHP - Tsirang Line	0.00	220kV DHP_TSI Line on Standby.
		Unit-II	45.56	220kV DHP - Dagapela Line	90.49	
		-	-	220kV Jigmeling - Dagapela Line	-28.98	
		-	-	5MVA, 220/33kV TFR	0.35	
<b>Total</b>	<b>90.97</b>	<b>Auxiliary Consumption &amp; Transformation Losses at Generator end</b>	<b>0.14%</b>			
7	60MW KHP	Unit- I	16.54	132kV KHP - Nangkhoh Line	39.11	
		Unit-II	16.48	132kV KHP - Kilikhar Line	25.78	
		Unit- III	16.52	5MVA, 132/11kV TFR	0.61	
		Unit- IV	16.44	132kV Motanga - Rangia Line	48.18	
		<b>Total</b>	<b>65.98</b>	<b>Auxiliary Consumption &amp; Transformation Losses at Generator end</b>	<b>0.73%</b>	

**Note: Generation-Load Summary (MW) for September 29, 2022 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)
1	Western Grid	1,381.11	369.12	360.86	990.15	8.26
2	Eastern Grid	793.25	121.58	114.66	693.51	6.92
<b>Total</b>		<b>2,174.36</b>	<b>490.70</b>	<b>475.52</b>	<b>1,683.66</b>	<b>15.18</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 (MW)
1	Western Grid	1,511.48	303.38	295.31	1,179.24	8.07
2	Eastern Grid	588.58	56.07	52.77	561.37	3.30
<b>Total</b>		<b>2,100.06</b>	<b>359.45</b>	<b>348.08</b>	<b>1,740.61</b>	<b>11.37</b>

**Notes: BHP & MAT data collected from site.**

1. The Instantaneous load balance,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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