

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

**Coincidental Maximum Load**

<b>Date:</b>	<b>June 26, 2022</b>
<b>Hours:</b>	<b>19:00 Hours</b>

<b>Date</b>	<b>Time</b>	<b>Load(MW)</b>
12-Jan-22	18:00hrs	492.25

Sl. No.	Hydropower Plant	Unit	MW	Transmission Lines and Elements	Load (MW)	Remarks
1	1020MW THP	Unit- I	185.00	400kV THP - Siliguri Line - I	0.00	400kV THP-Siliguri line I & II under breakdown.
		Unit- II	139.25	400kV THP - Siliguri Line - II	0.00	
		Unit- III	167.50	400kV THP - Siliguri Line- IV	405.01	
		Unit- IV	100.02	400kV THP - Malbase Line - III	399.00	
		Unit- V	78.81	400kV Malbase - Siliguri Line	401.26	
		Unit- VI	139.33	-	-	
		<b>Total</b>	<b>809.91</b>	<b>Auxiliary Consumption &amp; Transformation Losses at Generator end</b>	<b>0.73%</b>	
2	720MW MHP	Unit-I	197.80	400kV MHP - Jigmeling Line - I	294.00	Unit III under shutdown. 400kV MHP-JLG Line II & IV on Standby. 132kV MHP_Yurmoo line I & II not in service. 400kV JLG_ALI Line II (Interim) on standby
		Unit-II	197.80	400kV MHP - Jigmeling Line - II	0.00	
		Unit-III	0.00	400kV MHP - Jigmeling Line - III	295.90	
		Unit-IV	197.80	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)	47.50	
		-	-	400kV Jigmeling - Alipurduar Line - I (Interim)	134.30	
		-	-	400kV Jigmeling - Alipurduar Line - II (Interim)	0.00	
		-	-	400kV Jigmeling - Alipurduar Line - I (Direct)	200.20	
		-	-	400kV Jigmeling - Alipurduar Line - II (Direct)	201.90	
		-	-	80MVA, 220/132kV ICT - I (HV)	41.20	
		-	-	80MVA, 220/132kV ICT - II (HV)	41.90	
		-	-	220kV Tsirang - Jigmeling Line	73.40	
-	-	132kV Gelephu - Salakati Line	19.10			
<b>Total</b>	<b>593.40</b>	<b>Auxiliary Consumption &amp; Transformation Losses at Generator end</b>	<b>0.59%</b>			
3	336MW CHP	Unit- I	91.92	220kV CHP - Birpara Line- I	71.29	
		Unit- II	91.38	220kV CHP - Birpara Line- II	71.42	
		Unit- III	91.58	220kV CHP - Malbase Line- III	149.90	
		Unit- IV	91.70	220kV CHP - Semtokha Line- IV	52.34	
		-	-	220kV Malbase - Birpara Line	0.00	
		-	-	66kV CHP - Chumdo Line	13.91	
		-	-	66kV CHP - Gedu Line	5.37	
		-	-	3x3MVA, 66/11kV TFR	1.60	
<b>Total</b>	<b>366.58</b>	<b>Auxiliary Consumption &amp; Transformation Losses at Generator end</b>	<b>0.20%</b>			
4	24MW BHP (U/S)	Unit- I	12.30	220kV BHP - Semtokha Line	49.03	
		Unit- II	12.10	66kV BHP - Lobeyssa Line	25.51	
		<b>Total</b>	<b>24.40</b>	220kV BHP - Tsirang Line	-10.73	
5	40MW BHP (L/S)	Unit- I	20.50	5MVA, 66/11kV TFR	0.58	
		Unit- II	21.10	30MVA ICT, 220/66kV (HV)	2.62	
		<b>Total</b>	<b>41.60</b>	<b>Auxiliary Consumption &amp; Transformation Losses at Generator end</b>	<b>2.44%</b>	
6	126MW DHP	Unit-I	44.41	220kV DHP - Tsirang Line	87.94	220kV DHP_Dagapela Line on Standby.
		Unit-II	43.98	220kV DHP - Dagapela Line	0.00	
		-	-	220kV Jigmeling - Dagapela Line	36.10	
		-	-	5MVA, 220/33kV TFR	0.30	
<b>Total</b>	<b>88.39</b>	<b>Auxiliary Consumption &amp; Transformation Losses at Gen. end</b>	<b>0.17%</b>			
7	60MW KHP	Unit- I	16.60	132kV KHP - Nangkhoh Line	38.80	
		Unit-II	16.60	132kV KHP - Kilikhar Line	26.40	
		Unit- III	16.50	5MVA, 132/11kV TFR	0.40	
		Unit- IV	16.60	132kV Motanga - Rangia Line	34.90	
		<b>Total</b>	<b>66.30</b>	<b>Auxiliary Consumption &amp; Transformation Losses at Generator end</b>	<b>1.06%</b>	

**Note: Generation-Load Summary (MW) for June 26, 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	1,330.88	308.50	300.09	948.98	8.41
2	Eastern Grid	659.70	142.70	138.50	590.40	4.20
<b>Total</b>		<b>1,990.58</b>	<b>451.20</b>	<b>438.59</b>	<b>1,539.38</b>	<b>12.61</b>

**Note: Generation-Load Summary for June 26, 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	1,358.79	260.55	255.70	996.14	4.85
2	Eastern Grid	658.42	72.64	68.62	687.88	4.02
<b>Total</b>		<b>2,017.21</b>	<b>333.19</b>	<b>324.32</b>	<b>1,684.02</b>	<b>8.87</b>

**NOTE-BHP Generation 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**

<b>Date:</b>	<b>June 27, 2022</b>
<b>Hours:</b>	<b>09:00 Hours</b>

<b>Date</b>	<b>Time</b>	<b>Load(MW)</b>
12-Jan-22	18:00hrs	492.25

Sl. No.	Hydropower Plant	Unit	MW	Transmission Lines and Elements	Load (MW)	Remarks
1	1020MW THP	Unit- I	186.72	400kV THP - Siliguri Line - I	0.00	400kV THP-Siliguri line I & II under breakdown.
		Unit- II	140.04	400kV THP - Siliguri Line - II	0.00	
		Unit- III	168.30	400kV THP - Siliguri Line- IV	446.02	
		Unit- IV	138.24	400kV THP - Malbase Line - III	438.51	
		Unit- V	117.33	400kV Malbase - Siliguri Line	439.45	
		Unit- VI	139.46	-	-	
		<b>Total</b>	<b>890.09</b>	<b>Auxiliary Consumption &amp; Transformation Losses at Generator end</b>	<b>0.62%</b>	
2	720MW MHP	Unit-I	197.82	400kV MHP - Jigmeling Line - I	294.08	Unit III under shutdown. 400kV MHP-JLG Line II & IV on Standby. 132kV MHP_Yurmoo line I & II not in service. 400kV JLG_ALI Line II (Interim) on standby
		Unit-II	197.79	400kV MHP - Jigmeling Line - II	0.00	
		Unit-III	0.00	400kV MHP - Jigmeling Line - III	296.09	
		Unit-IV	197.67	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)	3.93	
		-	-	400kV Jigmeling - Alipurduar Line - I (Interim)	143.88	
		-	-	400kV Jigmeling - Alipurduar Line - II (Interim)	0.00	
		-	-	400kV Jigmeling - Alipurduar Line - I (Direct)	216.80	
		-	-	400kV Jigmeling - Alipurduar Line - II (Direct)	215.18	
		-	-	80MVA, 220/132kV ICT - I (HV)	30.62	
		-	-	80MVA, 220/132kV ICT - II (HV)	31.17	
		-	-	220kV Tsirang - Jigmeling Line	93.64	
-	-	132kV Gelephu - Salakati Line	13.20			
<b>Total</b>	<b>593.28</b>	<b>Auxiliary Consumption &amp; Transformation Losses at Generator end</b>	<b>0.52%</b>			
3	336MW CHP	Unit- I	91.49	220kV CHP - Birpara Line- I	80.39	
		Unit- II	91.43	220kV CHP - Birpara Line- II	80.07	
		Unit- III	91.51	220kV CHP - Malbase Line- III	150.29	
		Unit- IV	91.64	220kV CHP - Semtokha Line- IV	36.76	
		-	-	220kV Malbase - Birpara Line	14.92	
		-	-	66kV CHP - Chumdo Line	11.37	
		-	-	66kV CHP - Gedu Line	5.33	
		-	-	3x3MVA, 66/11kV TFR	1.05	
<b>Total</b>	<b>366.07</b>	<b>Auxiliary Consumption &amp; Transformation Losses at Generator end</b>	<b>0.22%</b>			
4	24MW BHP (U/S)	Unit- I	12.30	220kV BHP - Semtokha Line	56.23	
		Unit- II	12.10	66kV BHP - Lobeyasa Line	24.64	
		<b>Total</b>	<b>24.40</b>	220kV BHP - Tsirang Line	-15.71	
5	40MW BHP (L/S)	Unit- I	20.60	5MVA, 66/11kV TFR	0.38	
		Unit- II	21.20	30MVA ICT, 220/66kV (HV)	1.28	
		<b>Total</b>	<b>41.80</b>	<b>Auxiliary Consumption &amp; Transformation Losses at Generator end</b>	<b>1.00%</b>	
6	126MW DHP	Unit-I	56.43	220kV DHP - Tsirang Line	111.94	220kV DHP_Dagapela Line on Standby.
		Unit-II	56.02	220kV DHP - Dagapela Line	0.00	
		-	-	220kV Jigmeling - Dagapela Line	35.22	
		-	-	5MVA, 220/33kV TFR	0.20	
<b>Total</b>	<b>112.45</b>	<b>Auxiliary Consumption &amp; Transformation Losses at Generator end</b>	<b>0.28%</b>			
7	60MW KHP	Unit- I	16.50	132kV KHP - Nangkhoh Line	42.67	
		Unit-II	16.50	132kV KHP - Kilikhar Line	23.22	
		Unit- III	16.50	5MVA, 132/11kV TFR	0.36	
		Unit- IV	16.50	132kV Motanga - Rangia Line	32.17	
		<b>Total</b>	<b>66.00</b>	<b>Auxiliary Consumption &amp; Transformation Losses at Generator end</b>	<b>-0.38%</b>	

**Note: Generation-Load Summary (MW) for June 27, 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	1,434.81	280.32	272.98	1,060.85	7.34
2	Eastern Grid	659.28	131.69	128.83	621.23	2.86
<b>Total</b>		<b>2,094.09</b>	<b>412.01</b>	<b>401.81</b>	<b>1,682.08</b>	<b>10.20</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	1,393.43	266.15	259.32	1,045.78	6.83
2	Eastern Grid	659.34	67.03	63.05	673.81	3.98
<b>Total</b>		<b>2,052.77</b>	<b>333.18</b>	<b>322.37</b>	<b>1,719.59</b>	<b>10.81</b>

**NOTE- All East load & BHP Generation 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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