

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

**Coincidental Maximum Load**

<b>Date:</b>	<b>July 8, 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	185.79	400kV THP - Siliguri Line - I	0.00	400kV THP-Siliguri line I & II under breakdown.
		Unit- II	69.77	400kV THP - Siliguri Line - II	0.00	
		Unit- III	137.97	400kV THP - Siliguri Line- IV	354.29	
		Unit- IV	168.47	400kV THP - Malbase Line - III	348.36	
		Unit- V	68.07	400kV Malbase - Siliguri Line	350.58	
		Unit- VI	79.52	-	-	
		<b>Total</b>	<b>709.59</b>	<b>Auxiliary Consumption &amp; Transformation Losses at Generator end</b>	<b>0.98%</b>	
2	720MW MHP	Unit-I	165.14	400kV MHP - Jigmeling Line - I	245.74	Unit III under shutdown. 400kV MHP-JLG line II & 400kV MHP-JLG Line IV on Standby. 132kV MHP_Yurmo line I & II not in service. 400kV JLG_ALI Line I (Interim) on standby.
		Unit-II	165.11	400kV MHP - Jigmeling Line - II	0.00	
		Unit-III	0.00	400kV MHP - Jigmeling Line - III	246.98	
		Unit-IV	165.54	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)	61.32	
		-	-	400kV Jigmeling - Alipurduar Line - I (Interim)	0.00	
		-	-	400kV Jigmeling - Alipurduar Line - II (Interim)	103.99	
		-	-	400kV Jigmeling - Alipurduar Line - I (Direct)	158.90	
		-	-	400kV Jigmeling - Alipurduar Line - II (Direct)	160.67	
		-	-	80MVA, 220/132kV ICT - I (HV)	24.05	
		-	-	80MVA, 220/132kV ICT - II (HV)	24.51	
		-	-	220kV Tsirang - Jigmeling Line	20.66	
-	-	132kV Gelephu - Salakati Line	14.42			
<b>Total</b>	<b>495.79</b>	<b>Auxiliary Consumption &amp; Transformation Losses at Generator end</b>	<b>0.62%</b>			
3	336MW CHP	Unit- I	91.84	220kV CHP - Birpara Line- I	47.44	Unit IV under Shutdown.
		Unit- II	89.07	220kV CHP - Birpara Line- II	47.51	
		Unit- III	90.58	220kV CHP - Malbase Line- III	127.68	
		Unit- IV	0.00	220kV CHP - Semtokha Line- IV	28.56	
		-	-	220kV Malbase - Birpara Line	-20.85	
		-	-	66kV CHP - Chumdo Line	12.16	
		-	-	66kV CHP - Gedu Line	5.48	
		-	-	3x3MVA, 66/11kV TFR	1.05	
<b>Total</b>	<b>271.49</b>	<b>Auxiliary Consumption &amp; Transformation Losses at Generator end</b>	<b>0.59%</b>			
4	24MW BHP (U/S)	Unit- I	10.66	220kV BHP - Semtokha Line	67.84	
		Unit- II	10.66	66kV BHP - Lobeyasa Line	25.05	
		<b>Total</b>	<b>21.32</b>	220kV BHP - Tsirang Line	-34.50	
5	40MW BHP (L/S)	Unit- I	19.33	5MVA, 66/11kV TFR	0.78	
		Unit- II	19.20	30MVA ICT, 220/66kV (HV)	4.40	
		<b>Total</b>	<b>38.53</b>	<b>Auxiliary Consumption &amp; Transformation Losses at Generator end</b>	<b>1.14%</b>	
6	126MW DHP	Unit-I	57.41	220kV DHP - Tsirang Line	57.09	Unit II on standby. 220kV DHP_Dagapela Line on Standby.
		Unit-II	0.00	220kV DHP - Dagapela Line	0.00	
		-	-	220kV Jigmeling - Dagapela Line	32.34	
		-	-	5MVA, 220/33kV TFR	0.25	
<b>Total</b>	<b>57.41</b>	<b>Auxiliary Consumption &amp; Transformation Losses at Gen. end</b>	<b>0.12%</b>			
7	60MW KHP	Unit- I	16.52	132kV KHP - Nangkhoh Line	11.33	
		Unit-II	16.47	132kV KHP - Kilikhar Line	53.66	
		Unit- III	16.50	5MVA, 132/11kV TFR	0.40	
		Unit- IV	16.53	132kV Motanga - Rangia Line	16.24	
		<b>Total</b>	<b>66.02</b>	<b>Auxiliary Consumption &amp; Transformation Losses at Generator end</b>	<b>0.95%</b>	

**Note: Generation-Load Summary (MW) for July 08, 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	1,098.34	298.71	289.41	778.97	9.30
2	Eastern Grid	561.81	128.25	124.55	454.22	3.70
<b>Total</b>		<b>1,660.15</b>	<b>426.96</b>	<b>413.96</b>	<b>1,233.19</b>	<b>13.00</b>

**Note: Generation-Load Summary for July 08, 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	1,667.30	249.08	197.88	1,306.94	51.20
2	Eastern Grid	659.14	71.81	68.05	698.61	3.76
<b>Total</b>		<b>2,326.44</b>	<b>320.89</b>	<b>265.93</b>	<b>2,005.55</b>	<b>54.96</b>

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>July 9, 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	182.83	400kV THP - Siliguri Line - I	0.00	400kV THP-Siliguri line I & II under breakdown.
		Unit- II	69.07	400kV THP - Siliguri Line - II	0.00	
		Unit- III	138.17	400kV THP - Siliguri Line- IV	413.22	
		Unit- IV	168.48	400kV THP - Malbase Line - III	405.71	
		Unit- V	156.48	400kV Malbase - Siliguri Line	409.82	
		Unit- VI	109.08	-	-	
		<b>Total</b>	<b>824.11</b>	<b>Auxiliary Consumption &amp; Transformation Losses at Generator end</b>	<b>0.63%</b>	
2	720MW MHP	Unit-I	197.56	400kV MHP - Jigmeling Line - I	192.05	Unit III under shutdown. Unit IV under breakdown. 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
		Unit-II	190.45	400kV MHP - Jigmeling Line - II	0.00	
		Unit-III	0.00	400kV MHP - Jigmeling Line - III	190.45	
		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)	-2.58	
		-	-	400kV Jigmeling - Alipurduar Line - I (Interim)	0.00	
		-	-	400kV Jigmeling - Alipurduar Line - II (Interim)	92.54	
		-	-	400kV Jigmeling - Alipurduar Line - I (Direct)	146.58	
		-	-	400kV Jigmeling - Alipurduar Line - II (Direct)	147.48	
		-	-	80MVA, 220/132kV ICT - I (HV)	29.15	
		-	-	80MVA, 220/132kV ICT - II (HV)	29.71	
		-	-	220kV Tsirang - Jigmeling Line	97.91	
-	-	132kV Gelephu - Salakati Line	11.60			
<b>Total</b>	<b>388.01</b>	<b>Auxiliary Consumption &amp; Transformation Losses at Generator end</b>	<b>1.42%</b>			
3	336MW CHP	Unit- I	91.22	220kV CHP - Birpara Line- I	48.69	Unit IV under Shutdown.
		Unit- II	89.00	220kV CHP - Birpara Line- II	48.86	
		Unit- III	91.49	220kV CHP - Malbase Line- III	126.97	
		Unit- IV	0.00	220kV CHP - Semtokha Line- IV	28.79	
		-	-	220kV Malbase - Birpara Line	-17.98	
		-	-	66kV CHP - Chumdo Line	11.09	
		-	-	66kV CHP - Gedu Line	5.33	
		-	-	3x3MVA, 66/11kV TFR	0.98	
<b>Total</b>	<b>271.71</b>	<b>Auxiliary Consumption &amp; Transformation Losses at Generator end</b>	<b>0.37%</b>			
4	24MW BHP (U/S)	Unit- I	12.10	220kV BHP - Semtokha Line	64.27	
		Unit- II	11.80	66kV BHP - Lobeyasa Line	25.00	
		<b>Total</b>	<b>23.90</b>	220kV BHP - Tsirang Line	-24.61	
5	40MW BHP (L/S)	Unit- I	20.50	5MVA, 66/11kV TFR	0.43	
		Unit- II	21.20	30MVA ICT, 220/66kV (HV)	2.13	
		<b>Total</b>	<b>41.70</b>	<b>Auxiliary Consumption &amp; Transformation Losses at Generator end</b>	<b>0.78%</b>	
6	126MW DHP	Unit-I	63.35	220kV DHP - Tsirang Line	125.64	220kV DHP_Dagapela Line on Standby. Unit-II standby.
		Unit-II	62.95	220kV DHP - Dagapela Line	0.00	
		-	-	220kV Jigmeling - Dagapela Line	35.34	
		-	-	5MVA, 220/33kV TFR	0.65	
<b>Total</b>	<b>126.30</b>	<b>Auxiliary Consumption &amp; Transformation Losses at Generator end</b>	<b>0.01%</b>			
7	60MW KHP	Unit- I	16.49	132kV KHP - Nangkhoh Line	1.85	
		Unit-II	16.49	132kV KHP - Kilikhar Line	63.12	
		Unit- III	16.53	5MVA, 132/11kV TFR	0.39	
		Unit- IV	16.45	132kV Motanga - Rangia Line	25.01	
		<b>Total</b>	<b>65.96</b>	<b>Auxiliary Consumption &amp; Transformation Losses at Generator end</b>	<b>0.91%</b>	

**Note: Generation-Load Summary (MW) for July 09, 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	1,287.72	287.20	280.50	902.61	6.70
2	Eastern Grid	453.97	128.67	122.56	423.21	6.11
<b>Total</b>		<b>1,741.69</b>	<b>415.87</b>	<b>403.06</b>	<b>1,325.82</b>	<b>12.81</b>

**Note: Generation-Load Summary for July 09, 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)
1	Western Grid	1,660.21	273.32	263.41	1,283.29	9.91
2	Eastern Grid	659.07	67.87	64.45	694.80	3.42
<b>Total</b>		<b>2,319.28</b>	<b>341.19</b>	<b>327.86</b>	<b>1,978.09</b>	<b>13.33</b>

**NOTE: MHP 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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