

BHUTAN POWER SYSTEM OPERATOR LOAD-GENERATION BALANCE REPORT

Coincidental Maximum Load

Date: September 20, 2022
Hours: 19:00 Hours

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

Sl. No.	Hydropower Plant	Unit	MW	Transmission Lines and Elements	Load (MW)	Remarks
1	1020MW THP	Unit- I	185.16	400kV THP - Siliguri Line - I	261.90	
		Unit- II	184.37	400kV THP - Siliguri Line - II	260.35	
		Unit- III	185.99	400kV THP - Siliguri Line- IV	252.89	
		Unit- IV	185.70	400kV THP - Malbase Line - III	331.19	
		Unit- V	184.96	400kV Malbase - Siliguri Line	232.03	
		Unit- VI	185.08	-	-	
		Total	1,111.26	Auxiliary Consumption & Transformation Losses at Generator end	0.44%	
2	720MW MHP	Unit-I	135.23	400kV MHP - Jigmeling Line - I	268.02	400kV MHP-JLG Line II & IV on Standby. 132kV MHP_Yurmo line I & II not in service. 400kV JLG_ALI Line I (Interim) on Standby.
		Unit-II	135.18	400kV MHP - Jigmeling Line - II	0.00	
		Unit-III	135.47	400kV MHP - Jigmeling Line - III	269.81	
		Unit-IV	135.60	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)	66.70	
		-	-	400kV Jigmeling - Alipurduar Line - I (Interim)	0.00	
		-	-	400kV Jigmeling - Alipurduar Line - II (Interim)	114.90	
		-	-	400kV Jigmeling - Alipurduar Line - I (Direct)	174.79	
		-	-	400kV Jigmeling - Alipurduar Line - II (Direct)	173.59	
		-	-	80MVA, 220/132kV ICT - I (HV)	46.30	
		-	-	80MVA, 220/132kV ICT - II (HV)	47.25	
		-	-	220kV Tsirang - Jigmeling Line	-1.83	
-	-	132kV Gelephu - Salakati Line	16.60			
Total	541.48	Auxiliary Consumption & Transformation Losses at Generator end	0.67%			
3	336MW CHP	Unit- I	91.42	220kV CHP - Birpara Line- I	79.73	
		Unit- II	91.22	220kV CHP - Birpara Line- II	79.71	
		Unit- III	91.33	220kV CHP - Malbase Line- III	94.81	
		Unit- IV	76.27	220kV CHP - Semtokha Line- IV	71.96	
		-	-	220kV Malbase - Birpara Line	58.10	
		-	-	66kV CHP - Chumdo Line	16.08	
		-	-	66kV CHP - Gedu Line	5.81	
		-	-	3x3MVA, 66/11kV TFR	0.85	
Total	350.24	Auxiliary Consumption & Transformation Losses at Generator end	0.37%			
4	24MW BHP (U/S)	Unit- I	12.30	220kV BHP - Semtokha Line	37.00	
		Unit- II	12.10	66kV BHP - Lobeysa Line	26.63	
		Total	24.40	220kV BHP - Tsirang Line	0.99	
5	40MW BHP (L/S)	Unit- I	20.50	5MVA, 66/11kV TFR	0.71	
		Unit- II	21.10	30MVA ICT, 220/66kV (HV)	3.46	
		Total	41.60	Auxiliary Consumption & Transformation Losses at Generator end	1.02%	
6	126MW DHP	Unit-I	38.35	220kV DHP - Tsirang Line	0.00	220kV DHP_Tsirang Line on Standby.
		Unit-II	37.54	220kV DHP - Dagapela Line	75.43	
		-	-	220kV Jigmeling - Dagapela Line	-28.49	
		-	-	5MVA, 220/33kV TFR	0.35	
Total	75.89	Auxiliary Consumption & Transformation Losses at Gen. end	0.14%			
7	60MW KHP	Unit- I	16.50	132kV KHP - Nangkhor Line	36.39	
		Unit-II	16.50	132kV KHP - Kilikhar Line	28.37	
		Unit- III	16.50	5MVA, 132/11kV TFR	0.60	
		Unit- IV	16.50	132kV Motanga - Rangia Line	37.72	
		Total	66.00	Auxiliary Consumption & Transformation Losses at Generator end	0.97%	

Note: Generation-Load Summary (MW) for September 20, 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	1,603.39	352.02	345.02	1,224.71	7.00
2	Eastern Grid	607.48	116.54	112.25	517.60	4.29
Total		2,210.87	468.56	457.27	1,742.31	11.29

Note: Generation-Load Summary for September 20, 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	1,471.89	309.89	301.62	1,083.11	8.27
2	Eastern Grid	637.86	82.23	77.07	634.52	5.16
Total		2,109.75	392.12	378.69	1,717.63	13.43

NOTE- Eastern & BHP 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 21, 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	185.77	400kV THP - Siliguri Line - I	224.03	
		Unit- II	184.87	400kV THP - Siliguri Line - II	222.94	
		Unit- III	185.58	400kV THP - Siliguri Line - IV	219.29	
		Unit- IV	0.00	400kV THP - Malbase Line - III	259.26	
		Unit- V	186.81	400kV Malbase - Siliguri Line	204.53	
		Unit- VI	187.37	-	-	
		Total	930.40	Auxiliary Consumption & Transformation Losses at Generator end	0.52%	
2	720MW MHP	Unit-I	135.10	400kV MHP - Jigmeling Line - I	268.12	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	135.18	400kV MHP - Jigmeling Line - II	0.00	
		Unit-III	135.40	400kV MHP - Jigmeling Line - III	270.21	
		Unit-IV	135.48	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)	34.98	
		-	-	400kV Jigmeling - Alipurduar Line - I (Interim)	0.00	
		-	-	400kV Jigmeling - Alipurduar Line - II (Interim)	123.00	
		-	-	400kV Jigmeling - Alipurduar Line - I (Direct)	187.00	
		-	-	400kV Jigmeling - Alipurduar Line - II (Direct)	186.00	
		-	-	80MVA, 220/132kV ICT - I (HV)	34.37	
		-	-	80MVA, 220/132kV ICT - II (HV)	35.04	
		-	-	220kV Tsirang - Jigmeling Line	6.30	
-	-	132kV Gelephu - Salakati Line	12.20			
Total	541.16	Auxiliary Consumption & Transformation Losses at Generator end	0.52%			
3	336MW CHP	Unit- I	91.43	220kV CHP - Birpara Line- I	77.17	
		Unit- II	91.17	220kV CHP - Birpara Line- II	77.40	
		Unit- III	91.43	220kV CHP - Malbase Line- III	117.89	
		Unit- IV	75.58	220kV CHP - Semtokha Line- IV	57.28	
		-	-	220kV Malbase - Birpara Line	35.50	
		-	-	66kV CHP - Chumdo Line	11.96	
		-	-	66kV CHP - Gedu Line	6.32	
		-	-	3x3MVA, 66/11kV TFR	0.78	
Total	349.61	Auxiliary Consumption & Transformation Losses at Generator end	0.23%			
4	24MW BHP (U/S)	Unit- I	12.10	220kV BHP - Semtokha Line	33.50	
		Unit- II	12.00	66kV BHP - Lobeysa Line	23.36	
		Total	24.10	220kV BHP - Tsirang Line	7.67	
5	40MW BHP (L/S)	Unit- I	20.40	5MVA, 66/11kV TFR	0.36	
		Unit- II	21.10	30MVA ICT, 220/66kV (HV)	0.18	
		Total	41.50	Auxiliary Consumption & Transformation Losses at Generator end	1.08%	
6	126MW DHP	Unit-I	37.35	220kV DHP - Tsirang Line	0.00	220kV DHP_TSI Line on Standby.
		Unit-II	37.00	220kV DHP - Dagapela Line	73.93	
		-	-	220kV Jigmeling - Dagapela Line	-28.04	
		-	-	5MVA, 220/33kV TFR	0.35	
Total	74.35	Auxiliary Consumption & Transformation Losses at Generator end	0.09%			
7	60MW KHP	Unit- I	16.50	132kV KHP - Nangkhoh Line	39.92	
		Unit-II	16.50	132kV KHP - Kilikhar Line	24.87	
		Unit- III	16.50	5MVA, 132/11kV TFR	0.50	
		Unit- IV	16.50	132kV Motanga - Rangia Line	26.85	
		Total	66.00	Auxiliary Consumption & Transformation Losses at Generator end	1.08%	

Note: Generation-Load Summary (MW) for September 21, 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	1,419.96	324.76	318.29	1,060.86	6.47
2	Eastern Grid	607.16	106.45	102.91	535.05	3.54
Total		2,027.12	431.21	421.20	1,595.91	10.01

Note: Generation-Load Summary for September 21, 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	1,483.46	305.36	289.26	1,091.20	16.10
2	Eastern Grid	638.01	64.22	60.41	660.69	3.81
Total		2,121.47	369.58	349.67	1,751.89	19.91

Notes: MHP & MAT data collected from site.

- 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:
 - 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.
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