

BHUTAN POWER SYSTEM OPERATOR LOAD-GENERATION BALANCE REPORT

Coincidental Maximum Load

Date: December 30, 2021
Hours: 18:00 Hours

Date	Time	Load(MW)
30-Dec-21	18:00hrs	487.76

Sl. No.	Hydropower Plant	Unit	MW	Transmission Lines and Elements	Load (MW)	Remarks
1	1020MW THP	Unit- I	0.00	400kV THP - Siliguri Line - I	0.00	Unit-I & III under Annual Maintenance & Unit- II & V on standby. 400kV THP-Siliguri line I under breakdown. 400kV THP-Siliguri line II on Standby
		Unit- II	0.00	400kV THP - Siliguri Line - II	0.00	
		Unit- III	0.00	400kV THP - Siliguri Line- IV	86.81	
		Unit- IV	99.35	400kV THP - Malbase Line - III	178.76	
		Unit- V	0.00	400kV Malbase - Siliguri Line	67.20	
		Unit- VI	167.97	-	-	
		Total	267.32	Auxiliary Consumption & Transformation Losses at Generator end	0.65%	
2	720MW MHP	Unit-I	0.00	400kV MHP - Jigmeling Line - I	139.09	Unit-II & III on Standby. Unit-IV under Annual Maintenance. 400kV MHP-JLG Line II, III & IV on standby. 132kV MHP_Yurmoo line I & II not in service. 400kV JLG_ALI Line II (Interim) on standby. 400kV JLG_ALI Line I (Direct) on standby.
		Unit-II	0.00	400kV MHP - Jigmeling Line - II	0.00	
		Unit-III	140.51	400kV MHP - Jigmeling Line - III	0.00	
		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)	108.77	
		-	-	400kV Jigmeling - Alipurduar Line - I (Interim)	11.60	
		-	-	400kV Jigmeling - Alipurduar Line - II (Interim)	0.00	
		-	-	400kV Jigmeling - Alipurduar Line - I (Direct)	0.00	
		-	-	400kV Jigmeling - Alipurduar Line - II (Direct)	18.23	
		-	-	80MVA, 220/132kV ICT - I (HV)	25.22	
		-	-	80MVA, 220/132kV ICT - II (HV)	24.59	
		-	-	220kV Tsirang - Jigmeling Line	-41.77	
-	-	132kV Gelephu - Salakati Line	-12.23			
Total	140.51	Auxiliary Consumption & Transformation Losses at Generator end	1.01%			
3	336MW CHP	Unit- I	65.54	220kV CHP - Birpara Line- I	0.00	Unit-II on Standby. Unit IV under Annual Maintenance. 220kV CHP_Birpara Line I & II under breakdown.
		Unit- II	0.00	220kV CHP - Birpara Line- II	0.00	
		Unit- III	70.06	220kV CHP - Malbase Line- III	29.08	
		Unit- IV	0.00	220kV CHP - Semtokha Line- IV	79.82	
		-	-	220kV Malbase - Birpara Line	-34.19	
		-	-	66kV CHP - Chumdo Line	22.50	
		-	-	66kV CHP - Gedu Line	2.24	
		-	-	3x3MVA, 66/11kV TFR	1.86	
Total	135.60	Auxiliary Consumption & Transformation Losses at Generator end	0.07%			
4	24MW BHP (U/S)	Unit- I	5.20	220kV BHP - Semtokha Line	67.22	
		Unit- II	4.90	66kV BHP - Lobeyasa Line	31.90	
		Total	10.10	220kV BHP - Tsirang Line	-70.18	
5	40MW BHP (L/S)	Unit- I	9.90	5MVA, 66/11kV TFR	0.99	
		Unit- II	10.10	30MVA ICT, 220/66kV (HV)	22.96	
		Total	20.00	Auxiliary Consumption & Transformation Losses at Generator end	0.56%	
6	126MW DHP	Unit-I	0.00	220kV DHP - Tsirang Line	33.04	Unit-I under Annual Maintenance. 220kV DHP-Dagapela Line on standby.
		Unit-II	33.98	220kV DHP - Dagapela Line	0.00	
		-	-	220kV Jigmeling - Dagapela Line	16.84	
		-	-	5MVA, 220/33kV TFR	0.93	
Total	33.98	Auxiliary Consumption & Transformation Losses at Gen. end	0.03%			
7	60MW KHP	Unit- I	0.00	132kV KHP - Nangkhor Line	5.86	Unit I on standby. Unit-IV under Annual Maintenance.
		Unit-II	12.57	132kV KHP - Kilikhar Line	18.19	
		Unit- III	12.53	5MVA, 132/11kV TFR	0.82	
		Unit- IV	0.00	132kV Motanga - Rangia Line	3.75	
		Total	25.10	Auxiliary Consumption & Transformation Losses at Generator end	0.91%	

Note: Generation-Load Summary (MW) for December 30, 2021 at 18:00hrs.

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	467.00	388.95	386.92	119.82	2.03
2	Eastern Grid	165.61	102.49	100.84	21.35	1.65
Total		632.61	491.44	487.76	141.17	3.68

Note: Generation-Load Summary for December 30, 2020 at 18:00hrs.

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	342.24	267.62	263.47	55.89	4.15
2	Eastern Grid	135.42	59.30	58.43	94.85	0.87
Total		477.66	326.92	321.90	150.74	5.02

NOTE- 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: December 31, 2021
Hours: 09:00 Hours

Date	Time	Load(MW)
30-Dec-21	18:00hrs	487.76

Sl. No.	Hydropower Plant	Unit	MW	Transmission Lines and Elements	Load (MW)	Remarks
1	1020MW THP	Unit- I	0.00	400kV THP - Siliguri Line - I	0.00	Unit-I, II & III under Annual Maintenance & Unit-V on standby. 400kV THP-Siliguri line I under breakdown. 400kV THP-Siliguri line II under Standby.
		Unit- II	0.00	400kV THP - Siliguri Line - II	0.00	
		Unit- III	0.00	400kV THP - Siliguri Line- IV	126.24	
		Unit- IV	178.34	400kV THP - Malbase Line - III	226.60	
		Unit- V	0.00	400kV Malbase - Siliguri Line	102.88	
		Unit- VI	178.25	-	-	
		Total	356.59	Auxiliary Consumption & Transformation Losses at Generator end	1.05%	
2	720MW MHP	Unit-I	0.00	400kV MHP - Jigmeling Line - I	137.35	Unit- I & II on Standby. Unit-IV under Annual Maintenance. 400kV MHP-JLG Line II, III & IV on standby. 132kV MHP_Yurmo line I & II not in service. 400kV JLG_ALI Line II (Interim) on standby. 400kV JLG_ALI Line I (Direct) on standby.
		Unit-II	0.00	400kV MHP - Jigmeling Line - II	0.00	
		Unit-III	138.34	400kV MHP - Jigmeling Line - III	0.00	
		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)	89.51	
		-	-	400kV Jigmeling - Alipurduar Line - I (Interim)	17.99	
		-	-	400kV Jigmeling - Alipurduar Line - II (Interim)	0.00	
		-	-	400kV Jigmeling - Alipurduar Line - I (Direct)	0.00	
		-	-	400kV Jigmeling - Alipurduar Line - II (Direct)	28.43	
		-	-	80MVA, 220/132kV ICT - I (HV)	17.30	
		-	-	80MVA, 220/132kV ICT - II (HV)	17.58	
		-	-	220kV Tsirang - Jigmeling Line	-37.31	
-	-	132kV Gelephu - Salakati Line	-2.17			
Total	138.34	Auxiliary Consumption & Transformation Losses at Generator end	0.72%			
3	336MW CHP	Unit- I	58.93	220kV CHP - Birpara Line- I	0.00	Unit-II on Standby. Unit-IV under Annual Maintenance. 220kV CHP_Birpara Line-I & II under breakdown..
		Unit- II	0.00	220kV CHP - Birpara Line- II	0.00	
		Unit- III	62.86	220kV CHP - Malbase Line- III	26.79	
		Unit- IV	0.00	220kV CHP - Semtokha Line- IV	71.33	
		-	-	220kV Malbase - Birpara Line	-32.30	
		-	-	66kV CHP - Chumdo Line	19.52	
		-	-	66kV CHP - Gedu Line	2.52	
		-	-	3x3MVA, 66/11kV TFR	1.55	
Total	121.79	Auxiliary Consumption & Transformation Losses at Generator end	0.07%			
4	24MW BHP (U/S)	Unit- I	4.60	220kV BHP - Semtokha Line	61.78	
		Unit- II	4.40	66kV BHP - Lobeyasa Line	29.13	
		Total	9.00	220kV BHP - Tsirang Line	-65.30	
5	40MW BHP (L/S)	Unit- I	8.30	5MVA, 66/11kV TFR	0.68	
		Unit- II	9.00	30MVA ICT, 220/66kV (HV)	20.82	
		Total	17.30	Auxiliary Consumption & Transformation Losses at Generator end	0.04%	
6	126MW DHP	Unit-I	0.00	220kV DHP - Tsirang Line	31.13	Unit-I under Annual Maintenance. 220kV DHP_Dagapela Line on standby.
		Unit-II	31.98	220kV DHP - Dagapela Line	0.00	
		-	-	220kV Jigmeling - Dagapela Line	15.79	
		-	-	5MVA, 220/33kV TFR	0.84	
Total	31.98	Auxiliary Consumption & Transformation Losses at Generator end	0.03%			
7	60MW KHP	Unit- I	0.00	132kV KHP - Nangkhoh Line	9.51	Unit I on standby. Unit-IV under Annual Maintenance.
		Unit-II	12.58	132kV KHP - Kilikhar Line	14.52	
		Unit- III	12.53	5MVA, 132/11kV TFR	0.69	
		Unit- IV	0.00	132kV Motanga - Rangia Line	-1.57	
		Total	25.11	Auxiliary Consumption & Transformation Losses at Generator end	1.54%	

Note: Generation-Load Summary (MW) for December 31, 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	536.66	377.15	373.30	196.82	3.85
2	Eastern Grid	163.45	83.46	82.08	42.68	1.38
Total		700.11	460.61	455.38	239.50	5.23

Note: Generation-Load Summary for December 31, 2020 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	337.88	229.16	220.67	94.21	8.49
2	Eastern Grid	147.47	51.65	50.73	110.33	0.92
Total		485.35	280.81	271.40	204.54	9.41

NOTE-BHP & 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.
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