

BHUTAN POWER SYSTEM OPERATOR LOAD-GENERATION BALANCE REPORT

Coincidental Maximum Load

Date: November 24, 2021
Hours: 19:00 Hours

Date: 18-Nov-21 **Time:** 18:00hrs **Load(MW):** 456.37 MW

| 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 on Standby. 400kV THP-Siliguri line I under breakdown. 400kV THP-MAL line under Annual Maintenance . |
| | | Unit- II | 0.00 | 400kV THP - Siliguri Line - II | 190.17 | |
| | | Unit- III | 0.00 | 400kV THP - Siliguri Line- IV | 184.03 | |
| | | Unit- IV | 139.18 | 400kV THP - Malbase Line - III | 0.00 | |
| | | Unit- V | 99.56 | 400kV Malbase - Siliguri Line | -58.39 | |
| | | Unit- VI | 138.36 | - | - | |
| | | Total | 377.10 | Auxiliary Consumption & Transformation Losses at Generator end | 0.77% | |
| 2 | 720MW MHP | Unit-I | 0.00 | 400kV MHP - Jigmeling Line - I | 98.54 | Unit-I on Standby. Unit-IV under Annual Maintenance. 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. JLG_ALI Line II (Direct) opened (Both end). |
| | | Unit-II | 130.19 | 400kV MHP - Jigmeling Line - II | 0.00 | |
| | | Unit-III | 68.91 | 400kV MHP - Jigmeling Line - III | 99.30 | |
| | | 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) | 65.10 | |
| | | - | - | 400kV Jigmeling - Alipurduar Line - I (Interim) | 51.90 | |
| | | - | - | 400kV Jigmeling - Alipurduar Line - II (Interim) | 0.00 | |
| | | - | - | 400kV Jigmeling - Alipurduar Line - I (Direct) | 78.59 | |
| | | - | - | 400kV Jigmeling - Alipurduar Line - II (Direct) | 0.00 | |
| | | - | - | 80MVA, 220/132kV ICT - I (HV) | 21.02 | |
| | | - | - | 80MVA, 220/132kV ICT - II (HV) | 21.37 | |
| | | - | - | 220kV Tsirang - Jigmeling Line | -9.82 | |
| - | - | 132kV Gelephu - Salakati Line | -0.27 | | | |
| Total | 199.10 | Auxiliary Consumption & Transformation Losses at Generator end | 0.63% | | | |
| 3 | 336MW CHP | Unit- I | 63.12 | 220kV CHP - Birpara Line- I | 18.63 | Unit-IV under Annual Maintenance. |
| | | Unit- II | 60.95 | 220kV CHP - Birpara Line- II | 18.98 | |
| | | Unit- III | 74.56 | 220kV CHP - Malbase Line- III | 66.69 | |
| | | Unit- IV | 0.00 | 220kV CHP - Semtokha Line- IV | 68.61 | |
| | | - | - | 220kV Malbase - Birpara Line | -20.67 | |
| | | - | - | 66kV CHP - Chumdo Line | 19.82 | |
| | | - | - | 66kV CHP - Gedu Line | 3.71 | |
| | | - | - | 3x3MVA, 66/11kV TFR | 2.09 | |
| Total | 198.63 | Auxiliary Consumption & Transformation Losses at Generator end | 0.05% | | | |
| 4 | 24MW BHP (U/S) | Unit- I | 7.00 | 220kV BHP - Semtokha Line | 64.40 | |
| | | Unit- II | 6.70 | 66kV BHP - Lobeyssa Line | 29.83 | |
| | | Total | 13.70 | 220kV BHP - Tsirang Line | -53.56 | |
| 5 | 40MW BHP (L/S) | Unit- I | 13.50 | 5MVA, 66/11kV TFR | 0.70 | |
| | | Unit- II | 13.70 | 30MVA ICT, 220/66kV (HV) | 17.10 | |
| | | Total | 27.20 | Auxiliary Consumption & Transformation Losses at Generator end | -1.15% | |
| 6 | 126MW DHP | Unit-I | 0.00 | 220kV DHP - Tsirang Line | 47.75 | Unit I on Standby. 220kV DHP_Dagapela Line on Standby. |
| | | Unit-II | 47.96 | 220kV DHP - Dagapela Line | 0.00 | |
| | | - | - | 220kV Jigmeling - Dagapela Line | 13.38 | |
| | | - | - | 5MVA, 220/33kV TFR | 0.20 | |
| Total | 47.96 | Auxiliary Consumption & Transformation Losses at Gen. end | 0.02% | | | |
| 7 | 60MW KHP | Unit- I | 13.06 | 132kV KHP - Nangkhoh Line | 18.75 | Unit-IV under Annual Maintenance. |
| | | Unit-II | 13.09 | 132kV KHP - Kilikhar Line | 19.61 | |
| | | Unit- III | 12.99 | 5MVA, 132/11kV TFR | 0.40 | |
| | | Unit- IV | 0.00 | 132kV Motanga - Rangia Line | 9.38 | |
| | | Total | 39.14 | Auxiliary Consumption & Transformation Losses at Generator end | 0.97% | |

Note: Generation-Load Summary (MW) for November 24, 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 | 664.59 | 355.04 | 352.50 | 332.75 | 2.54 |
| 2 | Eastern Grid | 238.24 | 75.44 | 73.80 | 139.60 | 1.64 |
| Total | | 902.83 | 430.48 | 426.30 | 472.35 | 4.18 |

Note: Generation-Load Summary for November 24, 2020 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 | 514.75 | 233.29 | 224.62 | 249.16 | 8.67 |
| 2 | Eastern Grid | 209.84 | 58.97 | 57.21 | 183.17 | 1.76 |
| Total | | 724.59 | 292.26 | 281.83 | 432.33 | 10.43 |

NOTE-BHP, MHPA and Rangia 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.
 - The clocks of all the locations are not synchronized.
- 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: November 25, 2021
Hours: 09:00 Hours

Date: 18-Nov-21 **Time:** 18:00hrs **Load(MW):** 456.37 MW

| 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 on Standby. 400kV THP-Siliguri line I under breakdown. 400kV THP-MAL line under Annual Maintenance . |
| | | Unit- II | 0.00 | 400kV THP - Siliguri Line - II | 198.54 | |
| | | Unit- III | 0.00 | 400kV THP - Siliguri Line- IV | 191.57 | |
| | | Unit- IV | 138.83 | 400kV THP - Malbase Line - III | 0.00 | |
| | | Unit- V | 117.50 | 400kV Malbase - Siliguri Line | -53.79 | |
| | | Unit- VI | 138.19 | - | - | |
| | | Total | 394.52 | Auxiliary Consumption & Transformation Losses at Generator end | 1.12% | |
| 2 | 720MW MHP | Unit-I | 0.00 | 400kV MHP - Jigmeling Line - I | 99.16 | Unit-I on Standby. Unit IV under Annual Maintenance. 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. JLG_ALI Line II(Direct) opened (Both end). |
| | | Unit-II | 130.10 | 400kV MHP - Jigmeling Line - II | 0.00 | |
| | | Unit-III | 70.11 | 400kV MHP - Jigmeling Line - III | 99.82 | |
| | | 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) | 51.52 | |
| | | - | - | 400kV Jigmeling - Alipurduar Line - I (Interim) | 57.61 | |
| | | - | - | 400kV Jigmeling - Alipurduar Line - II (Interim) | 0.00 | |
| | | - | - | 400kV Jigmeling - Alipurduar Line - I (Direct) | 87.81 | |
| | | - | - | 400kV Jigmeling - Alipurduar Line - II (Direct) | 0.00 | |
| | | - | - | 80MVA, 220/132kV ICT - I (HV) | 19.97 | |
| | | - | - | 80MVA, 220/132kV ICT - II (HV) | 20.30 | |
| | | - | - | 220kV Tsirang - Jigmeling Line | -2.98 | |
| - | - | 132kV Gelephu - Salakati Line | 3.67 | | | |
| Total | 200.21 | Auxiliary Consumption & Transformation Losses at Generator end | 0.61% | | | |
| 3 | 336MW CHP | Unit- I | 60.99 | 220kV CHP - Birpara Line- I | 22.92 | Unit-IV under Annual Maintenance. |
| | | Unit- II | 76.49 | 220kV CHP - Birpara Line- II | 22.98 | |
| | | Unit- III | 74.46 | 220kV CHP - Malbase Line- III | 82.93 | |
| | | Unit- IV | 0.00 | 220kV CHP - Semtokha Line- IV | 61.13 | |
| | | - | - | 220kV Malbase - Birpara Line | -26.45 | |
| | | - | - | 66kV CHP - Chumdo Line | 16.04 | |
| | | - | - | 66kV CHP - Gedu Line | 3.84 | |
| | | - | - | 3x3MVA, 66/11kV TFR | 1.31 | |
| Total | 211.94 | Auxiliary Consumption & Transformation Losses at Generator end | 0.37% | | | |
| 4 | 24MW BHP (U/S) | Unit- I | 6.90 | 220kV BHP - Semtokha Line | 54.80 | |
| | | Unit- II | 6.70 | 66kV BHP - Lobeyasa Line | 27.32 | |
| | | Total | 13.60 | 220kV BHP - Tsirang Line | -42.57 | |
| 5 | 40MW BHP (L/S) | Unit- I | 13.30 | 5MVA, 66/11kV TFR | 0.45 | |
| | | Unit- II | 13.40 | 30MVA ICT, 220/66kV (HV) | 14.46 | |
| | | Total | 26.70 | Auxiliary Consumption & Transformation Losses at Generator end | 0.74% | |
| 6 | 126MW DHP | Unit-I | 0.00 | 220kV DHP - Tsirang Line | 47.77 | Unit I on Standby. 220kV DHP_Dagapela Line on Standby. |
| | | Unit-II | 47.97 | 220kV DHP - Dagapela Line | 0.00 | |
| | | - | - | 220kV Jigmeling - Dagapela Line | 12.73 | |
| | | - | - | 5MVA, 220/33kV TFR | 0.10 | |
| Total | 47.97 | Auxiliary Consumption & Transformation Losses at Generator end | 0.21% | | | |
| 7 | 60MW KHP | Unit- I | 12.09 | 132kV KHP - Nangkhor Line | 19.29 | Unit-IV under Annual Maintenance. |
| | | Unit-II | 12.07 | 132kV KHP - Kilikhar Line | 16.25 | |
| | | Unit- III | 12.08 | 5MVA, 132/11kV TFR | 0.23 | |
| | | Unit- IV | 0.00 | 132kV Motanga - Rangia Line | 5.25 | |
| | | Total | 36.24 | Auxiliary Consumption & Transformation Losses at Generator end | 1.30% | |

Note: Generation-Load Summary (MW) for November 25, 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 | 694.73 | 354.67 | 349.07 | 355.77 | 5.60 |
| 2 | Eastern Grid | 236.45 | 66.40 | 64.70 | 154.34 | 1.70 |
| Total | | 931.18 | 421.07 | 413.77 | 510.11 | 7.30 |

Note: Generation-Load Summary for November 25, 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 | 528.90 | 205.16 | 201.26 | 316.41 | 3.90 |
| 2 | Eastern Grid | 200.19 | 50.65 | 47.30 | 156.87 | 3.35 |
| Total | | 729.09 | 255.81 | 248.56 | 473.28 | 7.25 |

NOTE-BHP, MHPA, CHP and Rangia 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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