

BHUTAN POWER SYSTEM OPERATOR LOAD-GENERATION BALANCE REPORT

Maximum Load/Demand till Date

Date: **September 4, 2021**
Hours: **19:00 Hours**

| Date | Time | Load(MW) |
|-----------|----------|----------|
| 27-Dec-18 | 18:18hrs | 399.35MW |

| Sl. No. | Hydropower Plant | Unit | MW | Transmission Lines and Elements | Load (MW) | Sign | Remarks |
|--------------|------------------|--|-----------------|--|---------------|------|---|
| 1 | 1020MW THP | Unit- I | 185.55 | 400kV THP - Siliguri Line - I | 0.00 | | 400kV THP-Siliguri line I under breakdown. |
| | | Unit- II | 185.80 | 400kV THP - Siliguri Line - II | 354.07 | + | |
| | | Unit- III | 184.39 | 400kV THP - Siliguri Line- IV | 337.67 | + | |
| | | Unit- IV | 185.32 | 400kV THP - Malbase Line - III | 413.63 | + | |
| | | Unit- V | 186.12 | 400kV Malbase - Siliguri Line | 312.79 | + | |
| | | Unit- VI | 186.76 | - | - | - | |
| | | Total | 1,113.94 | Auxiliary Consumption & Transformation Losses at Gen. end | 0.769% | | |
| 2 | 720MW MHP | Unit-I | 197.89 | 400kV MHP - Jigmeling Line - I | 255.41 | + | 400kV MHP-JLG Line II on standby.132kV MHP_Yurmoo line I & II not in service. 400kV JLG_ALI Line I (Interim) on standby. (There is a MW power difference of 12MW between MHP fdr sending end and Jigmeling fdr receiving end) |
| | | Unit-II | 196.80 | 400kV MHP - Jigmeling Line - II | 0.00 | | |
| | | Unit-III | 197.83 | 400kV MHP - Jigmeling Line - III | 265.07 | + | |
| | | Unit-IV | 196.76 | 400kV MHP - Jigmeling Line - IV | 264.58 | + | |
| | | - | - | 132kV MHP - Yurmo Line - I | 0.00 | | |
| | | - | - | 132kV MHP - Yurmo Line - II | 0.00 | | |
| | | - | - | 500MVA, 400/220kV ICT at Jigmeling (HV) | -12.00 | - | |
| | | - | - | 400kV Jigmeling - Alipurduar Line - I (Interim) | 0.00 | | |
| | | - | - | 400kV Jigmeling - Alipurduar Line - II (Interim) | 195.62 | + | |
| | | - | - | 400kV Jigmeling - Alipurduar Line - I (Direct) | 296.30 | + | |
| | | - | - | 400kV Jigmeling - Alipurduar Line - II (Direct) | 297.45 | + | |
| | | - | - | 80MVA, 220/132kV ICT - I (HV) | 38.80 | + | |
| | | - | - | 80MVA, 220/132kV ICT - II (HV) | 39.00 | + | |
| | | - | - | 220kV Tsirang - Jigmeling Line | 91.48 | + | |
| - | - | 132kV Gelephu - Salakati Line | 28.91 | + | | | |
| Total | 789.28 | Auxiliary Consumption & Transformation Losses at Gen. end | 0.535% | | | | |
| 3 | 336MW CHP | Unit- I | 92.34 | 220kV CHP - Birpara Line- I | 102.21 | + | |
| | | Unit- II | 90.93 | 220kV CHP - Birpara Line- II | 102.28 | + | |
| | | Unit- III | 91.85 | 220kV CHP - Malbase Line- III | 119.56 | + | |
| | | Unit- IV | 91.54 | 220kV CHP - Semtokha Line- IV | 23.48 | + | |
| | | - | - | 220kV Malbase - Birpara Line | 75.14 | + | |
| | | - | - | 66kV CHP - Chumdo Line | 10.18 | + | |
| | | - | - | 66kV CHP - Gedu Line | 5.72 | + | |
| | | - | - | 3x3MVA, 66/11kV TFR | 1.40 | + | |
| | | Total | 366.66 | Auxiliary Consumption & Transformation Losses at Gen. end | 0.499% | | |
| 4 | 24MW BHP (U/S) | Unit- I | 12.40 | 220kV BHP - Semtokha Line | 84.10 | + | |
| | | Unit- II | 12.30 | 66kV BHP - Lobeyssa Line | 11.80 | + | |
| | | Total | 24.70 | 220kV BHP - Tsirang Line | -30.31 | - | |
| 5 | 40MW BHP (L/S) | Unit- I | 20.70 | 5MVA, 66/11kV TFR | 0.90 | + | |
| | | Unit- II | 21.10 | 30MVA ICT, 220/66kV (HV) | -11.82 | - | |
| | | Total | 41.80 | Auxiliary Consumption & Transformation Losses at Gen. end | 0.015% | | |
| 6 | 126MW DHP | Unit-I | 63.61 | 220kV DHP - Tsirang Line | 126.27 | + | 220kV DHP_Dagapela Line on standby. |
| | | Unit-II | 63.21 | 220kV DHP - Dagapela Line | 0.00 | | |
| | | - | - | 220kV Jigmeling - Dagapela Line | 1.60 | + | |
| | | - | - | 5MVA, 220/33kV TFR | 0.28 | + | |
| | | Total | 126.82 | Auxiliary Consumption & Transformation Losses at Gen. end | 0.213% | | |
| 7 | 60MW KHP | Unit- I | 16.50 | 132kV KHP - Nangkhoh Line | 36.34 | + | |
| | | Unit-II | 16.50 | 132kV KHP - Kilikhar Line | 28.70 | + | |
| | | Unit- III | 16.50 | 5MVA, 132/11kV TFR | 0.31 | + | |
| | | Unit- IV | 16.50 | 132kV Motanga - Rangia Line | 44.37 | + | |
| | | Total | 66.00 | Auxiliary Consumption & Transformation Losses at Gen. end | 0.985% | | |

Note: Generation-Load Summary (MW) for September 04, 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) at Generator end. |
|--------|--------------|-----------------------|---------------------------------------|------------------------------------|-----------------------------|--|
| 1 | Western Grid | 1,673.92 | 298.28 | 289.20 | 1,284.16 | 9.08 |
| 2 | Eastern Grid | 855.28 | 84.11 | 79.24 | 862.65 | 4.87 |
| | Total | 2,529.20 | 382.39 | 368.44 | 2,146.81 | 13.95 |

Note: Generation-Load Summary for September 04, 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 |
|--------|--------------|-----------------------|---------------------------------------|------------------------------------|--------------------------|---|
| 1 | Western Grid | 1,466.63 | 191.77 | 175.11 | 1,184.63 | 16.66 |
| 2 | Eastern Grid | 637.58 | 62.52 | 59.20 | 665.29 | 3.32 |
| | Total | 2,104.21 | 254.29 | 234.31 | 1,849.92 | 19.98 |

NOTE-BHP and MHP data collected from site

1. The Instantaneous load balance is 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

Maximum Load/Demand till Date

Date: **September 5, 2021**
Hours: **09:00 Hours**

| Date | Time | Load(MW) |
|-----------|----------|----------|
| 27-Dec-18 | 18:18hrs | 399.35MW |

| Sl. No. | Hydropower Plant | Unit | MW | Transmission Lines and Elements | Load (MW) | Sign | Remarks |
|--------------|------------------|---|-----------------|---|---------------|------|---|
| 1 | 1020MW THP | Unit- I | 185.58 | 400kV THP - Siliguri Line - I | 0.00 | | 400kV THP-Siliguri line I under breakdown. |
| | | Unit- II | 185.17 | 400kV THP - Siliguri Line - II | 363.84 | + | |
| | | Unit- III | 185.85 | 400kV THP - Siliguri Line- IV | 346.01 | + | |
| | | Unit- IV | 185.45 | 400kV THP - Malbase Line - III | 394.52 | + | |
| | | Unit- V | 185.29 | 400kV Malbase - Siliguri Line | 329.47 | + | |
| | | Unit- VI | 185.65 | - | - | - | |
| | | Total | 1,112.99 | Auxiliary Consumption & Transformation Losses at Generator end | 0.774% | | |
| 2 | 720MW MHP | Unit-I | 197.78 | 400kV MHP - Jigmeling Line - I | 390.41 | + | 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. (There is a MW power difference of 12MW between MHP fdr sending end and Jigmeling fdr receiving end) |
| | | Unit-II | 196.90 | 400kV MHP - Jigmeling Line - II | 0.00 | | |
| | | Unit-III | 196.76 | 400kV MHP - Jigmeling Line - III | 393.30 | + | |
| | | Unit-IV | 196.90 | 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) | -43.30 | - | |
| | | - | - | 400kV Jigmeling - Alipurduar Line - I (Interim) | 0.00 | | |
| | | - | - | 400kV Jigmeling - Alipurduar Line - II (Interim) | 202.16 | + | |
| | | - | - | 400kV Jigmeling - Alipurduar Line - I (Direct) | 306.72 | + | |
| | | - | - | 400kV Jigmeling - Alipurduar Line - II (Direct) | 306.72 | + | |
| | | - | - | 80MVA, 220/132kV ICT - I (HV) | 27.00 | + | |
| | | - | - | 80MVA, 220/132kV ICT - II (HV) | 27.10 | + | |
| | | - | - | 220kV Tsirang - Jigmeling Line | 99.02 | + | |
| - | - | 132kV Gelephu - Salakati Line | 25.75 | + | | | |
| Total | 788.34 | Auxiliary Consumption & Transformation Losses at Generator end | 0.587% | | | | |
| 3 | 336MW CHP | Unit- I | 91.26 | 220kV CHP - Birpara Line- I | 98.11 | + | |
| | | Unit- II | 91.13 | 220kV CHP - Birpara Line- II | 98.08 | + | |
| | | Unit- III | 91.75 | 220kV CHP - Malbase Line- III | 134.78 | + | |
| | | Unit- IV | 91.48 | 220kV CHP - Semtokha Line- IV | 20.55 | + | |
| | | - | - | 220kV Malbase - Birpara Line | 56.50 | + | |
| | | - | - | 66kV CHP - Chumdo Line | 7.14 | + | |
| | | - | - | 66kV CHP - Gedu Line | 5.24 | + | |
| | | - | - | 3x3MVA, 66/11kV TFR | 0.87 | + | |
| | | Total | 365.62 | Auxiliary Consumption & Transformation Losses at Generator end | 0.232% | | |
| 4 | 24MW BHP (U/S) | Unit- I | 12.40 | 220kV BHP - Semtokha Line | 81.99 | + | |
| | | Unit- II | 12.20 | 66kV BHP - Lobeysa Line | 7.10 | + | |
| | | Total | 24.60 | 220kV BHP - Tsirang Line | -24.12 | - | |
| 5 | 40MW BHP (L/S) | Unit- I | 20.70 | 5MVA, 66/11kV TFR | 0.89 | + | |
| | | Unit- II | 21.10 | 30MVA ICT, 220/66kV (HV) | -15.32 | - | |
| | | Total | 41.80 | Auxiliary Consumption & Transformation Losses at Generator end | 0.813% | | |
| 6 | 126MW DHP | Unit-I | 63.68 | 220kV DHP - Tsirang Line | 126.41 | + | 220kV DHP_Dagapela Line on standby. |
| | | Unit-II | 63.26 | 220kV DHP - Dagapela Line | 0.00 | | |
| | | - | - | 220kV Jigmeling - Dagapela Line | 0.90 | + | |
| | | - | - | 5MVA, 220/33kV TFR | 0.30 | + | |
| | | Total | 126.94 | Auxiliary Consumption & Transformation Losses at Generator end | 0.181% | | |
| 7 | 60MW KHP | Unit- I | 16.60 | 132kV KHP - Nangkhoh Line | 41.31 | + | |
| | | Unit-II | 16.56 | 132kV KHP - Kilikhar Line | 24.22 | + | |
| | | Unit- III | 16.66 | 5MVA, 132/11kV TFR | 0.26 | + | |
| | | Unit- IV | 16.63 | 132kV Motanga - Rangia Line | 37.54 | + | |
| | | Total | 66.45 | Auxiliary Consumption & Transformation Losses at Generator end | 0.993% | | |

Note: Generation-Load Summary (MW) for September 05, 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) at Generator end. |
|--------|--------------|-----------------------|---------------------------------------|------------------------------------|--------------------------|--|
| 1 | Western Grid | 1,671.95 | 280.92 | 271.58 | 1,292.01 | 9.34 |
| 2 | Eastern Grid | 854.79 | 74.92 | 69.63 | 878.89 | 5.29 |
| | Total | 2,526.74 | 355.84 | 341.21 | 2,170.90 | 14.63 |

Note: Generation-Load Summary for September 05, 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 |
|--------|--------------|-----------------------|---------------------------------------|------------------------------------|--------------------------|---|
| 1 | Western Grid | 1,448.02 | 181.66 | 167.69 | 1,177.76 | 13.97 |
| 2 | Eastern Grid | 821.65 | 48.25 | 63.53 | 862.00 | -15.28 |
| | Total | 2,269.67 | 229.91 | 231.22 | 2,039.76 | -1.31 |

NOTE-BHP and MHP data collected from site

1. The Instantaneous load balance is 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.