

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

**Coincidental Maximum Load**

**Date:** December 22, 2021  
**Hours:** 18:00 Hours

| Date      | Time     | Load(MW) |
|-----------|----------|----------|
| 12-Dec-21 | 18:00hrs | 472.23   |

| 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.<br>400kV THP-Siliguri line I under breakdown.<br>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   | 58.10        |   |
|              |                  | Unit- IV  | 100.04        | 400kV THP - Malbase Line - III  | 139.54       |   |
|              |                  | Unit- V   | 0.00          | 400kV Malbase - Siliguri Line   | 40.72        |   |
|              |                  | Unit- VI  | 99.47         | -   | -            |   |
|              |                  | <b>Total</b>  | <b>199.51</b> | <b>Auxiliary Consumption &amp; Transformation Losses at Generator end</b> | <b>0.94%</b> |   |
| 2            | 720MW MHP        | Unit-I  | 134.92        | 400kV MHP - Jigmeling Line - I  | 133.23       | Unit-II & III on Standby.<br>Unit-IV under Annual Maintenance.<br>400kV MHP-JLG Line II, III & IV on standby.<br>132kV MHP_Yurmoo line I & II not in service.<br>400kV JLG_ALI Line II (Interim) on standby.<br>400kV JLG_ALI Line I (Direct) on standby. |
|              |                  | Unit-II   | 0.00          | 400kV MHP - Jigmeling Line - II   | 0.00         |   |
|              |                  | Unit-III  | 0.00          | 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)                                   | 102.17       |   |
|              |                  | -   | -             | 400kV Jigmeling - Alipurduar Line - I (Interim)                           | 18.26        |   |
|              |                  | -   | -             | 400kV Jigmeling - Alipurduar Line - II (Interim)                          | 0.00         |   |
|              |                  | -   | -             | 400kV Jigmeling - Alipurduar Line - I (Direct)                            | 0.00         |   |
|              |                  | -   | -             | 400kV Jigmeling - Alipurduar Line - II (Direct)                           | 11.17        |   |
|              |                  | -   | -             | 80MVA, 220/132kV ICT - I (HV)   | 21.71        |   |
|              |                  | -   | -             | 80MVA, 220/132kV ICT - II (HV)  | 21.98        |   |
|              |                  | -   | -             | 220kV Tsirang - Jigmeling Line  | -43.09       |   |
| -            | -                | 132kV Gelephu - Salakati Line   | -4.62         |   |              |   |
| <b>Total</b> | <b>134.92</b>    | <b>Auxiliary Consumption &amp; Transformation Losses at Generator end</b> | <b>1.25%</b>  |   |              |   |
| 3            | 336MW CHP        | Unit- I   | 93.35         | 220kV CHP - Birpara Line- I   | 0.00         | Unit-II on Standby.<br>Unit IV under Annual Maintenance.<br>220kV CHP_Birpara Line I on Standby.  |
|              |                  | Unit- II  | 0.00          | 220kV CHP - Birpara Line- II  | 15.33        |   |
|              |                  | Unit- III   | 91.95         | 220kV CHP - Malbase Line- III   | 48.46        |   |
|              |                  | Unit- IV  | 0.00          | 220kV CHP - Semtokha Line- IV   | 94.81        |   |
|              |                  | -   | -             | 220kV Malbase - Birpara Line  | -13.00       |   |
|              |                  | -   | -             | 66kV CHP - Chumdo Line  | 22.32        |   |
|              |                  | -   | -             | 66kV CHP - Gedu Line  | 1.89         |   |
|              |                  | -   | -             | 3x3MVA, 66/11kV TFR   | 1.98         |   |
| <b>Total</b> | <b>185.30</b>    | <b>Auxiliary Consumption &amp; Transformation Losses at Generator end</b> | <b>0.28%</b>  |   |              |   |
| 4            | 24MW BHP (U/S)   | Unit- I   | 9.50          | 220kV BHP - Semtokha Line   | 46.20        | U/S unit-II standby. L/S Unit I & II under Annual Maintenance.  |
|              |                  | Unit- II  | 0.00          | 66kV BHP - Lobeyasa Line  | 30.45        |   |
|              |                  | <b>Total</b>  | <b>9.50</b>   | 220kV BHP - Tsirang Line  | -68.18       |   |
| 5            | 40MW BHP (L/S)   | Unit- I   | 0.00          | 5MVA, 66/11kV TFR   | 0.95         | U/S unit-II standby. L/S Unit I & II under Annual Maintenance.  |
|              |                  | Unit- II  | 0.00          | 30MVA ICT, 220/66kV (HV)  | 22.13        |   |
|              |                  | <b>Total</b>  | <b>0.00</b>   | <b>Auxiliary Consumption &amp; Transformation Losses at Generator end</b> | <b>0.84%</b> |   |
| 6            | 126MW DHP        | Unit-I  | 0.00          | 220kV DHP - Tsirang Line  | 31.60        | Unit-I under Annual Maintenance.<br>220kV DHP-Dagapela Line on standby.   |
|              |                  | Unit-II   | 31.81         | 220kV DHP - Dagapela Line   | 0.00         |   |
|              |                  | -   | -             | 220kV Jigmeling - Dagapela Line   | 15.98        |   |
|              |                  | -   | -             | 5MVA, 220/33kV TFR  | 0.20         |   |
| <b>Total</b> | <b>31.81</b>     | <b>Auxiliary Consumption &amp; Transformation Losses at Gen. end</b>      | <b>0.03%</b>  |   |              |   |
| 7            | 60MW KHP         | Unit- I   | 12.66         | 132kV KHP - Nangkhoh Line   | 6.77         | Unit II on standby.<br>Unit-IV under Annual Maintenance.  |
|              |                  | Unit-II   | 0.00          | 132kV KHP - Kilikhar Line   | 17.40        |   |
|              |                  | Unit- III   | 12.63         | 5MVA, 132/11kV TFR  | 0.74         |   |
|              |                  | Unit- IV  | 0.00          | 132kV Motanga - Rangia Line   | 0.00         |   |
|              |                  | <b>Total</b>  | <b>25.29</b>  | <b>Auxiliary Consumption &amp; Transformation Losses at Generator end</b> | <b>1.52%</b> |   |

**Note: Generation-Load Summary (MW) for December 22, 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 | 426.12                | 368.06                                | 365.59                             | 101.15                   | 2.47   |
| 2            | Eastern Grid | 160.21                | 92.31                                 | 90.24                              | 24.81                    | 2.07   |
| <b>Total</b> |              | <b>586.33</b>         | <b>460.37</b>                         | <b>455.83</b>                      | <b>125.96</b>            | <b>4.55</b>  |

**Note: Generation-Load Summary for December 22, 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 | 408.06                | 246.14                                | 240.83                             | 144.37                   | 5.31   |
| 2            | Eastern Grid | 161.93                | 66.81                                 | 65.13                              | 112.67                   | 1.68   |
| <b>Total</b> |              | <b>569.99</b>         | <b>312.95</b>                         | <b>305.96</b>                      | <b>257.04</b>            | <b>6.99</b>  |

**NOTE- BHP, MHP and KHP 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 23, 2021  
**Hours:** 09:00 Hours

| Date      | Time     | Load(MW) |
|-----------|----------|----------|
| 12-Dec-21 | 18:00hrs | 472.23   |

| 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.<br>400kV THP-Siliguri line I under breakdown.<br>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   | 94.98        |  |
|              |                  | Unit- IV  | 139.21        | 400kV THP - Malbase Line - III  | 180.69       |  |
|              |                  | Unit- V   | 0.00          | 400kV Malbase - Siliguri Line   | 75.54        |  |
|              |                  | Unit- VI  | 139.18        | -   | -            |  |
|              |                  | <b>Total</b>  | <b>278.39</b> | <b>Auxiliary Consumption &amp; Transformation Losses at Generator end</b> | <b>0.98%</b> |  |
| 2            | 720MW MHP        | Unit-I  | 140.52        | 400kV MHP - Jigmeling Line - I  | 198.68       | Unit- III on Standby.<br>Unit-IV under Annual Maintenance.<br>400kV MHP-JLG Line II, III & IV on standby.<br>132kV MHP_Yurmo line I & II not in service.<br>400kV JLG_ALI Line II (Interim) on standby.<br>400kV JLG_ALI Line I (Direct) on standby. |
|              |                  | Unit-II   | 60.26         | 400kV MHP - Jigmeling Line - II   | 0.00         |  |
|              |                  | Unit-III  | 0.00          | 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)                                   | 98.08        |  |
|              |                  | -   | -             | 400kV Jigmeling - Alipurduar Line - I (Interim)                           | 38.30        |  |
|              |                  | -   | -             | 400kV Jigmeling - Alipurduar Line - II (Interim)                          | 0.00         |  |
|              |                  | -   | -             | 400kV Jigmeling - Alipurduar Line - I (Direct)                            | 0.00         |  |
|              |                  | -   | -             | 400kV Jigmeling - Alipurduar Line - II (Direct)                           | 60.18        |  |
|              |                  | -   | -             | 80MVA, 220/132kV ICT - I (HV)   | 21.98        |  |
|              |                  | -   | -             | 80MVA, 220/132kV ICT - II (HV)  | 22.34        |  |
|              |                  | -   | -             | 220kV Tsirang - Jigmeling Line  | -40.13       |  |
| -            | -                | 132kV Gelephu - Salakati Line   | 1.27          |   |              |  |
| <b>Total</b> | <b>200.78</b>    | <b>Auxiliary Consumption &amp; Transformation Losses at Generator end</b> | <b>1.05%</b>  |   |              |  |
| 3            | 336MW CHP        | Unit- I   | 74.75         | 220kV CHP - Birpara Line- I   | 0.00         | Unit-II on Standby.<br>Unit-IV under Annual Maintenance.<br>220kV CHP_Birpara Line-I on standby.   |
|              |                  | Unit- II  | 0.00          | 220kV CHP - Birpara Line- II  | 4.87         |  |
|              |                  | Unit- III   | 68.88         | 220kV CHP - Malbase Line- III   | 33.57        |  |
|              |                  | Unit- IV  | 0.00          | 220kV CHP - Semtokha Line- IV   | 82.54        |  |
|              |                  | -   | -             | 220kV Malbase - Birpara Line  | -17.70       |  |
|              |                  | -   | -             | 66kV CHP - Chumdo Line  | 19.63        |  |
|              |                  | -   | -             | 66kV CHP - Gedu Line  | 1.48         |  |
|              |                  | -   | -             | 3x3MVA, 66/11kV TFR   | 1.40         |  |
| <b>Total</b> | <b>143.63</b>    | <b>Auxiliary Consumption &amp; Transformation Losses at Generator end</b> | <b>0.10%</b>  |   |              |  |
| 4            | 24MW BHP (U/S)   | Unit- I   | 9.30          | 220kV BHP - Semtokha Line   | 48.10        | U/S Unit-I on standby./L/S Unit-I & II under shutdown.   |
|              |                  | Unit- II  | 0.00          | 66kV BHP - Lobeysa Line   | 28.14        |  |
|              |                  | <b>Total</b>  | <b>9.30</b>   | 220kV BHP - Tsirang Line  | -67.63       |  |
| 5            | 40MW BHP (L/S)   | Unit- I   | 0.00          | 5MVA, 66/11kV TFR   | 0.65         | U/S Unit-I on standby./L/S Unit-I & II under shutdown.   |
|              |                  | Unit- II  | 0.00          | 30MVA ICT, 220/66kV (HV)  | 19.73        |  |
|              |                  | <b>Total</b>  | <b>0.00</b>   | <b>Auxiliary Consumption &amp; Transformation Losses at Generator end</b> | <b>0.43%</b> |  |
| 6            | 126MW DHP        | Unit-I  | 0.00          | 220kV DHP - Tsirang Line  | 32.03        | Unit-I under Annual Maintenance.<br>220kV DHP_Dagapela Line on standby.  |
|              |                  | Unit-II   | 32.23         | 220kV DHP - Dagapela Line   | 0.00         |  |
|              |                  | -   | -             | 220kV Jigmeling - Dagapela Line   | 15.28        |  |
|              |                  | -   | -             | 5MVA, 220/33kV TFR  | 0.19         |  |
| <b>Total</b> | <b>32.23</b>     | <b>Auxiliary Consumption &amp; Transformation Losses at Generator end</b> | <b>0.03%</b>  |   |              |  |
| 7            | 60MW KHP         | Unit- I   | 11.49         | 132kV KHP - Nangkhoh Line   | 8.89         | Unit-II on Standby.<br>Unit-IV under Annual Maintenance.   |
|              |                  | Unit-II   | 0.00          | 132kV KHP - Kilikhar Line   | 13.21        |  |
|              |                  | Unit- III   | 11.51         | 5MVA, 132/11kV TFR  | 0.50         |  |
|              |                  | Unit- IV  | 0.00          | 132kV Motanga - Rangia Line   | -4.88        |  |
|              |                  | <b>Total</b>  | <b>23.00</b>  | <b>Auxiliary Consumption &amp; Transformation Losses at Generator end</b> | <b>1.74%</b> |  |

**Note: Generation-Load Summary (MW) for December 23, 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 | 463.55                | 345.99                                | 343.08                             | 157.69                   | 2.91   |
| 2            | Eastern Grid | 223.78                | 88.78                                 | 86.28                              | 94.87                    | 2.50   |
| <b>Total</b> |              | <b>687.33</b>         | <b>434.77</b>                         | <b>429.36</b>                      | <b>252.56</b>            | <b>5.41</b>  |

**Note: Generation-Load Summary for December 23, 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 | 389.43                | 229.93                                | 226.30                             | 144.50                   | 3.63   |
| 2            | Eastern Grid | 152.66                | 50.09                                 | 48.91                              | 117.57                   | 1.18   |
| <b>Total</b> |              | <b>542.09</b>         | <b>280.02</b>                         | <b>275.21</b>                      | <b>262.07</b>            | <b>4.81</b>  |

**NOTE-KHP & BHP data collected from site.**

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