

Barr River hydro scheme Monthly report – February 2024

1 Summary

A reasonable month ahead of target and the long term average on the back of higher than usual rainfall. An SSE restriction in the final days of the month significantly reduced output for those days.

2 Monthly generation & revenue

| Parameter | Value |
|---|----------|
| Actual generation (FIT meter), kWh | 582,749 |
| Average generation in month, kWh | 547,677 |
| Forecast generation in month (P50), kWh | 554,678 |
| Actual relative to forecast | 105.1% |
| Rainfall relative to 1991-2020 average by month | 106% |
| Calculated generation ¹ kWh | 620,238 |
| Actual relative to calculated generation, kWh | -37,489 |
| Actual relative to calculated generation, % | -6.0% |
| Approximate revenue in month ² | £205,490 |

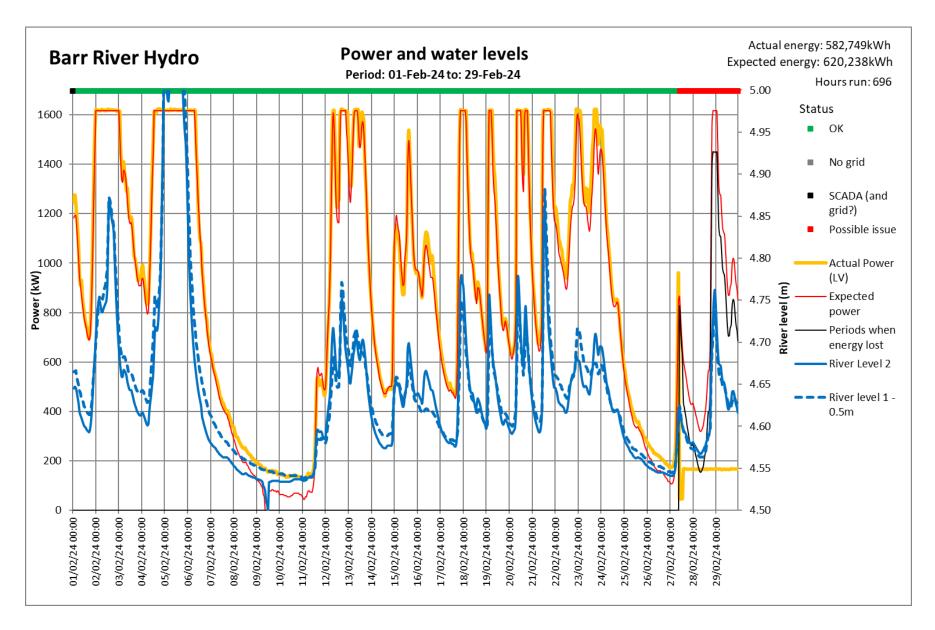
¹ Calculated generation is based on river level data and seeks to establish the expected generation with no performance issues.

² Export revenue based on reported export and estimated GDUoS charges.

| Export meter | Value |
|-----------------------------|---------|
| Export, kWh | 584,047 |
| Variance to generation, kWh | 1,298 |
| Variance to generation, % | 0.2% |



3 System reporting





3.1 Scheme anomalies to calculated generation

| Date/time | Details | Action required |
|-----------|--|---|
| 27/2/2024 | 9:20 Generation restricted at SSE's request to 50kW. SSE advised that there was a grid protection fault. 13:15- SSE approved an increase to 160kW. | SSEN removed the constraint at 17.30 on 1/3/24, operation returned to normal. |

3.2 Other system events

| Date/time | Details | Action required |
|-----------|---------|-----------------|
| | None | |

3.3 Head loss





3.4 Temperatures

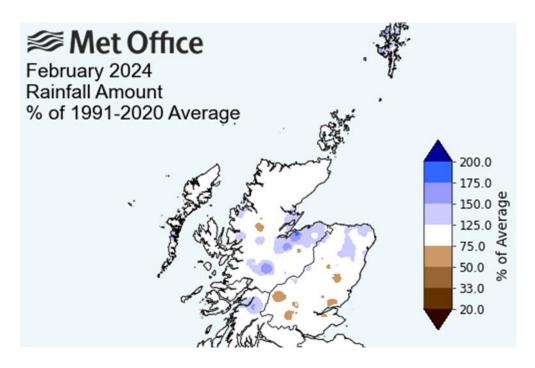
| Parameter | Temperature at or near full power, °C | Alert level, °C | Parameter | Temperature at or near full power, °C | Alert level, ⁰ C |
|-------------------------|--|-----------------|---------------------|--|-----------------------------|
| Generator DE bearing | 36 | 85 | Generator winding 1 | 64 | 145 |
| Generator NDE bearing 1 | 41 | 85 | Generator winding 2 | 61 | 145 |
| Generator NDE bearing 2 | 44 | 85 | Generator winding 3 | 65 | 145 |
| Turbine room | 20 | 30 | Power cabinet (RG1) | 31 | 42 |

3.5 Vibration

| Parameter | Vibration at or near full power, mm/s | Alert level, mm/s | Parameter | Vibration at or near full power, mm/s | Alert level, mm/s |
|--------------|---------------------------------------|-------------------|---------------|---------------------------------------|-------------------|
| Generator DE | 0.40 | 3.0 | Generator NDE | 1.21 | 3.0 |



4 Rainfall



| Rainfall this month (rain gauge), mm | 229 |
|--|-----|
| Western Scotland rainfall in month with respect to 1991-2020 long term average | 81% |



5 Scheme annual performance summary

| FY 2023/4 | Apr | May | Jun | Jul | Aug | Sep | Oct | Nov | Dec | Jan | Feb | Mar | Total |
|--|---|---|---|--|--|---|---|--|---|--|--|--|---|
| Actual generation kWh | 240,542 | 57,453 | 111,100 | 374,109 | 360,348 | 431,554 | 434,771 | 406,551 | 667,311 | 502,737 | 582,749 | | 4,169,225 |
| Average generation since commissioning | 247,605 | 424,386 | 286,501 | 165,261 | 174,610 | 297,736 | 672,489 | 693,043 | 368,179 | 594,556 | 547,677 | 298,520 | 4,472,041 |
| Forecast generation (P50) | 369,360 | 226,766 | 188,561 | 195,146 | 280,601 | 387,431 | 582,631 | 618,214 | 620,057 | 695,941 | 554,678 | 611,047 | 4,719,387 |
| Actual relative to forecast | 65.1% | 25.3% | 58.9% | 191.7% | 128.4% | 111.4% | 74.6% | 65.8% | 107.6% | 72.2% | 105.1% | | 88.3% |
| Rainfall relative to 1991-2020 average | 83% | 45% | 81% | 152% | 73% | 145% | 83% | 74% | 137% | 81% | 106% | | 96% |
| Calculated generation kWh | 243,307 | 59,162 | 112,194 | 377,850 | 418,162 | 438,789 | 445,408 | 428,068 | 672,901 | 536,047 | 620,238 | | 4,352,126 |
| Variance to calculated generation kWh | -2,765 | -1,709 | -1,094 | -3,741 | -57,814 | -7,235 | -10,637 | -21,517 | -5,590 | -33,310 | -37,489 | - | -182,901 |
| Variance to calculated generation % | -1.1% | -2.9% | -1.0% | -1.0% | -13.8% | -1.6% | -2.4% | -5.0% | -0.8% | -6.2% | -6.0% | | -4.2% |
| Approximate revenue | £18,747 | £7,087 | £14,675 | £52,099 | £50,104 | £60,181 | £148,850 | £137,974 | £227,701 | £170,888 | £205,490 | | £1,100,873 |
| Capacity factor (monthly) | 20.6% | 4.8% | 9.5% | 31.0% | 29.9% | 37.0% | 36.1% | 34.9% | 55.4% | 41.7% | 53.5% | | 32.2% |
| Industry wide RoR capacity factor | 20.7% | 5.7% | 6.0% | 27.5% | 25.0% | 36.0% | 40.0% | 45.0% | 46.0% | | | | 28.0% |
| | | | | | | | | | | | | | |
| FY 2022/3 | Apr | May | Jun | Jul | Aug | Sep | Oct | Nov | Dec | Jan | Feb | Mar | YTD |
| FY 2022/3 Actual generation kWh | Apr 247,605 | May 424,386 | Jun 286,501 | Jul 329,058 | Aug 257,505 | Sep 238,578 | Oct 692,787 | Nov 709,873 | Dec 223,709 | Jan 633,347 | Feb 447,449 | Mar 356,352 | YTD 4,847,150 |
| , | | | | | J | | | _ | | | | - | |
| Actual generation kWh | 247,605 | 424,386 | 286,501 | 329,058 | 257,505 | 238,578 | 692,787 | 709,873 | 223,709 | 633,347 | 447,449 | 356,352 | 4,847,150 |
| Actual generation kWh Average generation since commissioning | 247,605 247,605 | 424,386 424,386 | 286,501 286,501 | 329,058 165,261 | 257,505 174,610 | 238,578 | 692,787 672,489 | 709,873 693,043 | 223,709 368,179 | 633,347 594,556 | 447,449 547,677 | 356,352 298,520 | 4,847,150 4,770,561 |
| Actual generation kWh Average generation since commissioning Forecast generation (P50) | 247,605 247,605 369,360 | 424,386 424,386 226,766 | 286,501 286,501 188,561 | 329,058 165,261 195,146 | 257,505 174,610 280,601 | 238,578 297,736 387,431 | 692,787 672,489 582,631 | 709,873 693,043 618,214 | 223,709 368,179 620,057 | 633,347 594,556 695,941 | 447,449 547,677 554,678 | 356,352 298,520 611,047 | 4,847,150 4,770,561 5,330,433 |
| Actual generation kWh Average generation since commissioning Forecast generation (P50) Actual relative to forecast | 247,605 247,605 369,360 67.0% | 424,386 424,386 226,766 187.1% | 286,501 286,501 188,561 151.9% | 329,058 165,261 195,146 168.6% | 257,505 174,610 280,601 91.8% | 238,578 297,736 387,431 61.6% | 692,787 672,489 582,631 118.9% | 709,873 693,043 618,214 114.8% | 223,709 368,179 620,057 36.1% | 633,347 594,556 695,941 91.0% | 447,449 547,677 554,678 80.7% | 356,352 298,520 611,047 58.3% | 4,847,150 4,770,561 5,330,433 90.9% |
| Actual generation kWh Average generation since commissioning Forecast generation (P50) Actual relative to forecast Rainfall relative to 1991-2020 average | 247,605 247,605 369,360 67.0% 77% | 424,386 424,386 226,766 187.1% 126% | 286,501 286,501 188,561 151.9% 104% | 329,058 165,261 195,146 168.6% 74% | 257,505 174,610 280,601 91.8% 65% | 238,578 297,736 387,431 61.6% 93% | 692,787 672,489 582,631 118.9% | 709,873 693,043 618,214 114.8% 112% | 223,709 368,179 620,057 36.1% 89% | 633,347 594,556 695,941 91.0% 104% | 447,449 547,677 554,678 80.7% 56% | 356,352 298,520 611,047 58.3% 118% | 4,847,150 4,770,561 5,330,433 90.9% 96% |
| Actual generation kWh Average generation since commissioning Forecast generation (P50) Actual relative to forecast Rainfall relative to 1991-2020 average Calculated generation kWh | 247,605 247,605 369,360 67.0% 77% 253,540 | 424,386 424,386 226,766 187.1% 126% 432,296 | 286,501 286,501 188,561 151.9% 104% 294,437 | 329,058 165,261 195,146 168.6% 74% 330,341 | 257,505 174,610 280,601 91.8% 65% 257,587 | 238,578 297,736 387,431 61.6% 93% 239,724 | 692,787 672,489 582,631 118.9% 134% 700,013 | 709,873 693,043 618,214 114.8% 112% 748,966 | 223,709 368,179 620,057 36.1% 89% 295,507 | 633,347 594,556 695,941 91.0% 104% 639,670 | 447,449 547,677 554,678 80.7% 56% 459,640 | 356,352 298,520 611,047 58.3% 118% 358,262 | 4,847,150 4,770,561 5,330,433 90.9% 96% 5,009,984 |
| Actual generation kWh Average generation since commissioning Forecast generation (P50) Actual relative to forecast Rainfall relative to 1991-2020 average Calculated generation kWh Variance to calculated generation kWh | 247,605 247,605 369,360 67.0% 77% 253,540 -5,935 | 424,386 424,386 226,766 187.1% 126% 432,296 -7,910 | 286,501 286,501 188,561 151.9% 104% 294,437 -7,936 | 329,058 165,261 195,146 168.6% 74% 330,341 -1,283 | 257,505 174,610 280,601 91.8% 65% 257,587 -82 | 238,578 297,736 387,431 61.6% 93% 239,724 -1,146 | 692,787 672,489 582,631 118.9% 134% 700,013 | 709,873 693,043 618,214 114.8% 112% 748,966 -39,093 | 223,709 368,179 620,057 36.1% 89% 295,507 -71,798 | 633,347 594,556 695,941 91.0% 104% 639,670 -6,323 | 447,449 547,677 554,678 80.7% 56% 459,640 -12,191 | 356,352 298,520 611,047 58.3% 118% 358,262 -1,910 | 4,847,150 4,770,561 5,330,433 90.9% 96% 5,009,984 -162,834 |
| Actual generation kWh Average generation since commissioning Forecast generation (P50) Actual relative to forecast Rainfall relative to 1991-2020 average Calculated generation kWh Variance to calculated generation kWh Variance to calculated generation % | 247,605 247,605 369,360 67.0% 77% 253,540 -5,935 -2.3% | 424,386 424,386 226,766 187.1% 126% 432,296 -7,910 -1.8% | 286,501 286,501 188,561 151.9% 104% 294,437 -7,936 -2.7% | 329,058 165,261 195,146 168.6% 74% 330,341 -1,283 -0.4% | 257,505 174,610 280,601 91.8% 65% 257,587 -82 -0.0% | 238,578 297,736 387,431 61.6% 93% 239,724 -1,146 -0.5% | 692,787 672,489 582,631 118.9% 134% 700,013 -7,226 -1.0% | 709,873 693,043 618,214 114.8% 112% 748,966 -39,093 -5.2% | 223,709 368,179 620,057 36.1% 89% 295,507 -71,798 -24.3% | 633,347 594,556 695,941 91.0% 104% 639,670 -6,323 -1.0% | 447,449 547,677 554,678 80.7% 56% 459,640 -12,191 -2.7% | 356,352 298,520 611,047 58.3% 118% 358,262 -1,910 -0.5% | 4,847,150 4,770,561 5,330,433 90.9% 96% 5,009,984 -162,834 -3.3% |

¹Export element of revenue updated to reflect actual export and rate.



