



Barr River hydro scheme

Monthly report – July 2023

1 Summary

A strong month on the back of unseasonal wet weather. Few operational issues.

2 Monthly generation & revenue

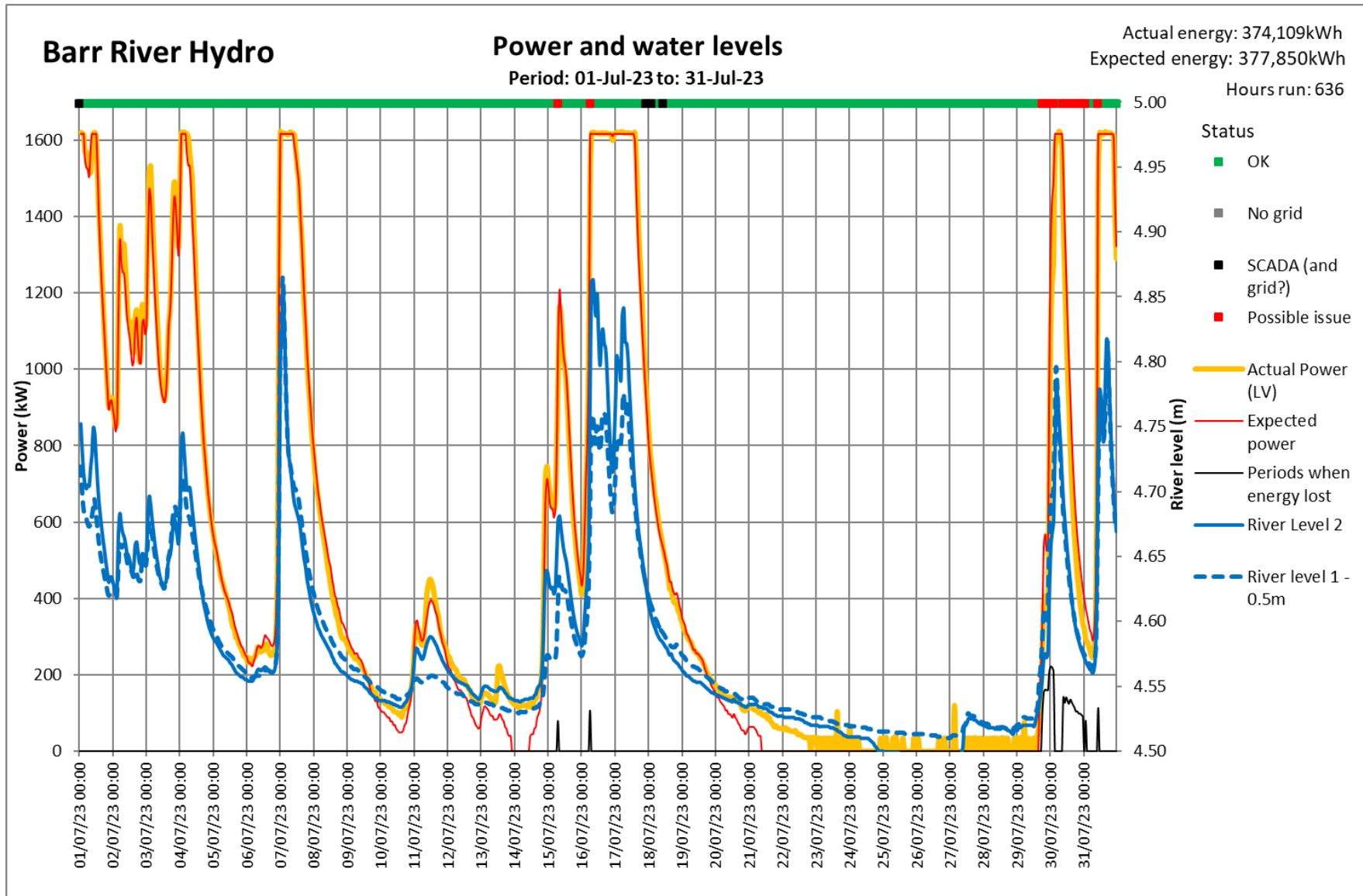
Parameter	Value
Actual generation (FIT meter), kWh	374,109
Average generation in month, kWh	165,261
Forecast generation in month (P50), kWh	195,146
Actual relative to forecast	191.7%
Rainfall relative to 1991-2020 average by month	152%
Calculated generation ¹ kWh	377,850
Actual relative to calculated generation, kWh	-3,741
Actual relative to calculated generation, %	-1.0%
Approximate revenue in month ²	£52,099

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	369,034
Variance to generation, kWh	-5,075
Variance to generation, %	-1.4%

3 System reporting



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4.1 Scheme anomalies to calculated generation

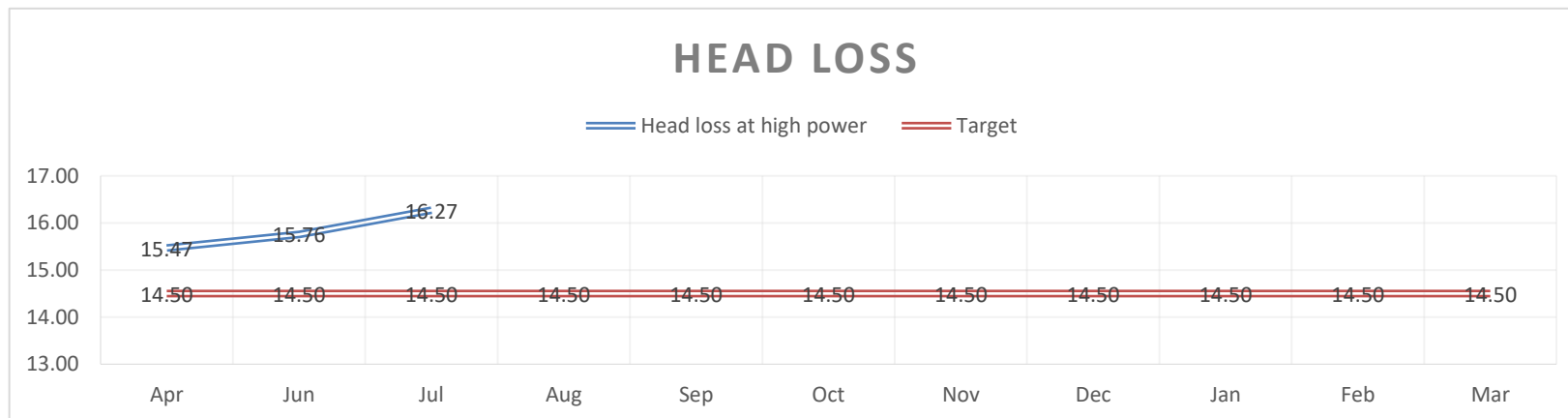
Date/time	Details	Action required
None		

4.2 Other system events

Date/time	Details	Action required
None		

4.3 Head loss

Target head loss at full power	Current head loss at full power	Status
14.5m	16.27m	Significantly increased and above target. Pigging by D A MacDonald instructed.



4.4 Temperatures

Parameter	Temperature at or near full power, °C	Alert level, °C	Parameter	Temperature at or near full power, °C	Alert level, °C
Generator DE bearing	39	85	Generator winding 1	68	145
Generator NDE bearing 1	45	85	Generator winding 2	66	145
Generator NDE bearing 2	48	85	Generator winding 3	69	145
Turbine room	24	30	Power cabinet (RG1)	31	42

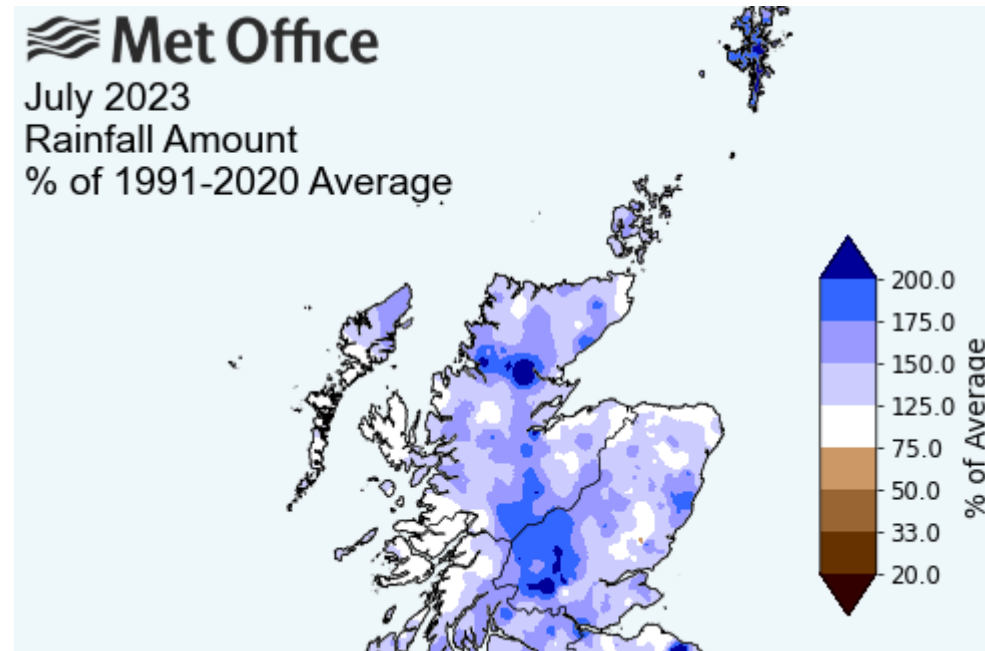
4.5 Vibration

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	0.45	3.0	Generator NDE	1.17	3.0

4.6 Recommended and ongoing actions

Action	Responsibility	Status
Install power quality monitoring equipment at grid connection to address grid trips affecting the generator breaker and requiring a site visit.	GHC	GHC remain in painful discussion with SSEN regarding what can be learned from the data available and obtaining more data. It seems that they can only capture 2 weeks of data at a time.
Chase SSE for details of planned outage in 2024	GHC	RH has had one high level meeting with SSE regarding this. GHC continue to keep up the pressure on SSEN to try to reduce this outage. Communication will now involve other scheme operators.
Housekeeping in turbine house	MorVolts	Spares to be arranged on shelves/in cupboard. Underway.
Spares stock to be reviewed	Morvolts/GHC	CINK asked to review spares list and advise if any other spares recommended – CINK chased, no response yet. Morvolts to check current spares inventory. Transformer breaker spares requirement to be checked by RB Switchgear on next attendance (note – will require HV isolation and therefore AP attendance).
Maintenance schedule and training to be reviewed	GHC	GHC have propose a simplified maintenance schedule. This will be discussed with Morvolts on site at the annual visit on 1 st September.
Arrangements to be established with Colin Thwaites for HV switching/isolation	Morvolts	MorVolts to confirm that Colin has been appointed as AP. Padlocks to be changed to Colin's locks.
Chase up export payment for late January and early February when scheme was generating but no export recorded.	Morvolts	Raised with EDF and SCADA data provided. Chased again by GHC 21/6/23 and followed up 19/7/23.
Missing data from March export statement	GHC	Should be automatically updated but raised with EDF and SCADA supplied. Chased 31/6/2023.

5 Rainfall



Rainfall this month (rain gauge), mm	154
Western Scotland rainfall in month with respect to 1991-2020 long term average	152%

6 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									783,204
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	1,123,753
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	979,833
Actual relative to forecast	65.1%	25.3%	58.9%	191.7%									79.9%
Rainfall relative to 1991-2020 average	83%	45%	81%	152%									90%
Calculated generation kWh	243,307	59,162	112,194	377,850									792,513
Variance to calculated generation kWh	-2,765	-1,709	-1,094	-3,741	-	-	-	-	-	-	-	-	-9,309
Variance to calculated generation %	-1.1%	-2.9%	-1.0%	-1.0%									-1.2%
Approximate revenue	£18,747	£7,087	£14,675	£52,099									£107,354
Capacity factor (monthly)	20.6%	4.8%	9.5%	31.0%									16.5%
Industry wide RoR capacity factor													
FY 2022/3	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	YTD
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
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	4,770,561
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	5,330,433
Actual relative to forecast	67.0%	187.1%	151.9%	168.6%	91.8%	61.6%	118.9%	114.8%	36.1%	91.0%	80.7%	58.3%	90.9%
Rainfall relative to 1991-2020 average	77%	126%	104%	74%	65%	93%	134%	112%	89%	104%	56%	118%	96%
Calculated generation kWh	253,540	432,296	294,437	330,341	257,587	239,724	700,013	748,966	295,507	639,670	459,640	358,262	5,009,984
Variance to calculated generation kWh	-5,935	-7,910	-7,936	-1,283	-82	-1,146	-7,226	-39,093	-71,798	-6,323	-12,191	-1,910	-162,834
Variance to calculated generation %	-2.3%	-1.8%	-2.7%	-0.4%	-0.0%	-0.5%	-1.0%	-5.2%	-24.3%	-1.0%	-2.7%	-0.5%	-3.3%
Approximate revenue ¹	£28,994	£50,244	£33,677	£38,789	£30,177	£27,894	£108,061	£111,476	£34,832	£44,660	£31,298	£52,804	£669,447
Capacity factor (monthly)	20.5%	39.0%	23.8%	28.2%	21.4%	20.5%	57.5%	60.9%	18.6%	52.5%	41.1%	29.6%	34.2%
Industry wide RoR capacity factor	19.4%	34.6%	18.3%	15.5%	15.5%	11.9%	55.8%	59.0%	32.6%	58.8%	50.2%	30.9%	33.5%

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

