



Barr River hydro scheme

Monthly report – May 2022

1 Summary

May was much wetter than normal and as a consequence the generation in the month significantly exceeded the forecast figure. The plant performed well throughout the month with no issues that lead to loss of revenue. A grid constraint was in place during the first week, the river levels were low for most of that period. Some revenue was lost over two days, but not a significant amount. SSE notified GHC late on Thursday night that the constraint was being lifted early and the plant restriction was removed within one hour of that notification.

2 Monthly generation & revenue

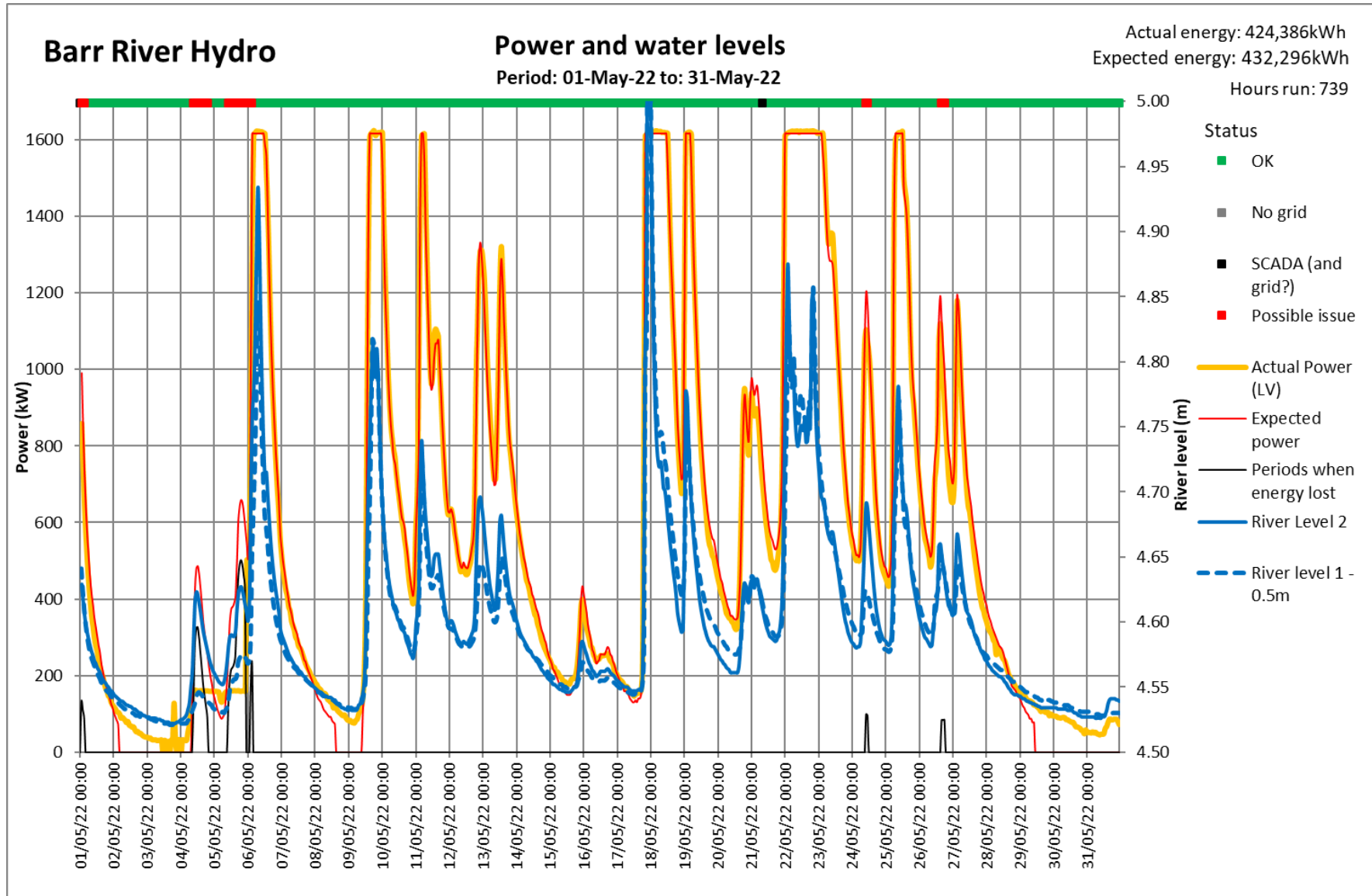
Parameter	Value
Actual generation (FIT meter), kWh	424,386
Average generation in month, kWh	424,386
Forecast generation in month (P50), kWh	226,766
Actual relative to forecast	187.1%
Rainfall relative to 1991-2020 average by month	126%
Calculated generation ¹ kWh	432,296
Actual relative to calculated generation, kWh	-7,910
Actual relative to calculated generation, %	-1.8%
Approximate revenue in month ²	£51,079

¹ Calculated generation is based on river level data and seeks to establish the expected generation with no performance issues. The expected power and energy calculations are being calibrated and will be refined over the coming months as more data is gathered.

² Export revenue based on generated output and estimated export rate.

Export meter	Value
Export, kWh	421,621
Variance to generation, kWh	-2,765
Variance to generation, %	-0.7%

3 System reporting



3.1 Scheme anomalies to calculated generation

Date/time	Details	Action required
01/05/2022	Imperfect river level/power relationship when river receding, no issues apparent.	None
04/05/2022 to 05/05/2022	Grid constraint, 160kW.	None
06/05/2022 21/05/2022 24/05/2022	River 2 rose much faster than river 1, some spilling at chamber 2 until river 1 caught up.	None
26/05/2022	Imperfect river level/power relationship when river receding, no issues apparent.	None

3.2 Other system events

Date/time	Details	Action required
02/05/2022	Max spear opening set to 9.3%, equivalent to 160kW (LV) to satisfy grid constraint. No effect on power as only at 80kW.	Reset once grid constraint lifted
03/05/2022	Chamber 1 stop reset to 1.5m now that chamber draining issue has been resolved by Alva.	None
05/05/2022	Grid constraint lifted (early notification received by SSE Control room).	Spear settings reset.
09/05/2022	Machine tripped with high reactive energy at 9/5 18:45 but automatically restarted and back at full power within 10mins.	
18/05/2022	Grid trip, automatically restarted	None
21/05/2022	Some gaps/anomalies in SCADA log files, no notable data loss.	None
25/05/2022	G99 trip, NT reported plant restarted OK	None

3.3 Head loss

Target head loss at full power	Current head loss at full power	Status
14.5m	13.45m	Slight increase. Within target

3.4 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	37	85	Generator winding 1	66	145
Generator NDE bearing 1	41	85	Generator winding 2	63	145
Generator NDE bearing 2	44	85	Generator winding 3	67	145
Turbine room	22	30	Power cabinet (RG1)	30	42

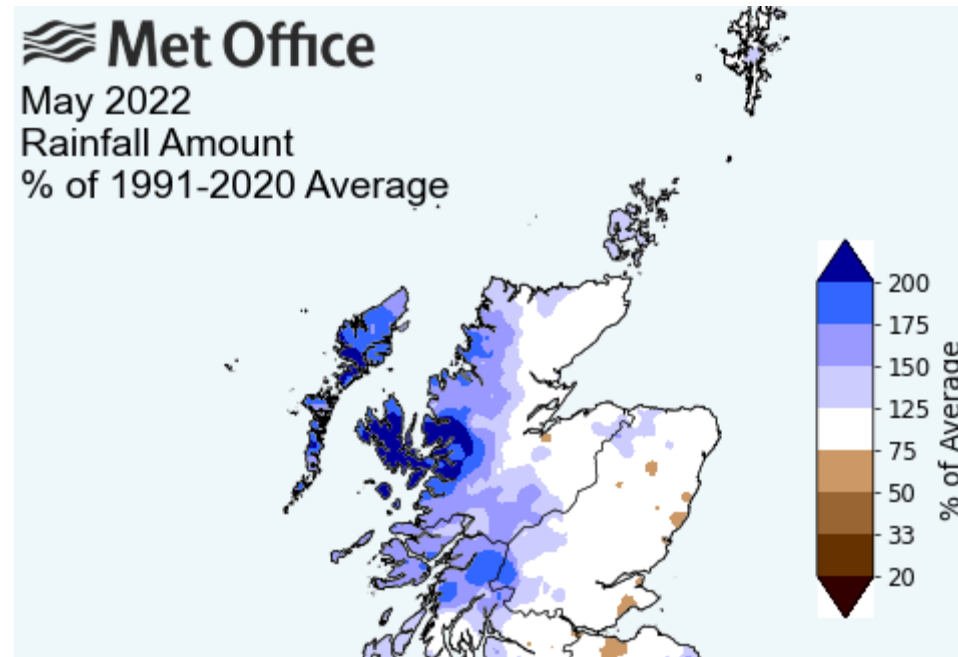
3.5 Vibration

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	0.41	3.0	Generator NDE	1.16	3.0

4 Recommended and ongoing actions

Action	Responsibility	Status
Fuses to be labelled clearly in X91 (signal cable junction box in powerhouse)	MorVolts	Ongoing? MorVolts to advise status.
More fuses to be ordered	MorVolts	Ongoing? MorVolts to advise status.
Monitor for export readings in excess of generation readings.	GHC	Ongoing
Install power quality monitoring equipment at grid connection to address grid trips affecting the generator breaker and requiring a site visit.	GHC	SSE contacted and agreed to provide equipment when available (was expected to be mid May). GHC to chase up.
Service to be arranged	GHC/CINK	CINK were waiting to coordinate with Glenachulish turbine install but have decided to separate the two and are now planning to attend Barr in July.
Caretaker training (Douglas Taylor)	GHC/MorVolts	We understand a new caretaker has been appointed and await instruction from MorVolts in relation to training/meeting.

5 Rainfall



Rainfall this month (rain gauge), mm	166
Western Scotland rainfall in month with respect to 1991-2020 long term average	126%

6 Scheme annual performance summary

2022	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	YTD
Actual generation kWh	555,764	647,905	240,688	247,605	424,386								2,116,348
Average generation since commissioning	555,764	647,905	240,688	247,605	424,386		1,463	91,714	356,893	652,190	676,213	514,099	2,116,348
Forecast generation (P50)	695,941	554,678	611,047	369,360	226,766	188,561	195,146	280,601	387,431	582,631	618,214	620,057	2,457,792
Actual relative to forecast	79.9%	116.8%	39.4%	67.0%	187.1%								86.1%
Rainfall relative to 1991-2020 average	58.0%	163%	51%	77%	126%								95%
Calculated generation kWh	494,286	664,527	241,159	253,540	432,296								2,162,507
Variance to calculated generation kWh	61,478	-16,622	-471	-5,935	-7,910	-	-	-	-	-	-	-	-46,159
Variance to calculated generation %	+12.4%	-2.5%	-0.2%	-2.3%	-1.8%								-2.1%
Approximate revenue	£72,273	£84,255	£31,299	£29,616	£51,079								£268,522
Capacity factor (monthly)	46.1%	59.5%	20.0%	21.2%	35.2%								36.4%
Industry wide RoR capacity factor	52.2%	63.2%	26.7%	19.4%									40.4%

