



Barr River hydro scheme

Monthly report – June 2022

1 Summary

June was much wetter than ‘normal’ and the plant responded well to the available rainfall. There were some issues in the middle of the month associated with a failed level sensor. This was exacerbated by an issue with the email account administration which meant that alarms were not sent. The underlying cause of the email problem has been resolved and it has been clarified that Alva (via CINK) are responsible for account maintenance in the future. There is a significant discrepancy in the site export value which MorVolts are following up with Engie.

2 Monthly generation & revenue

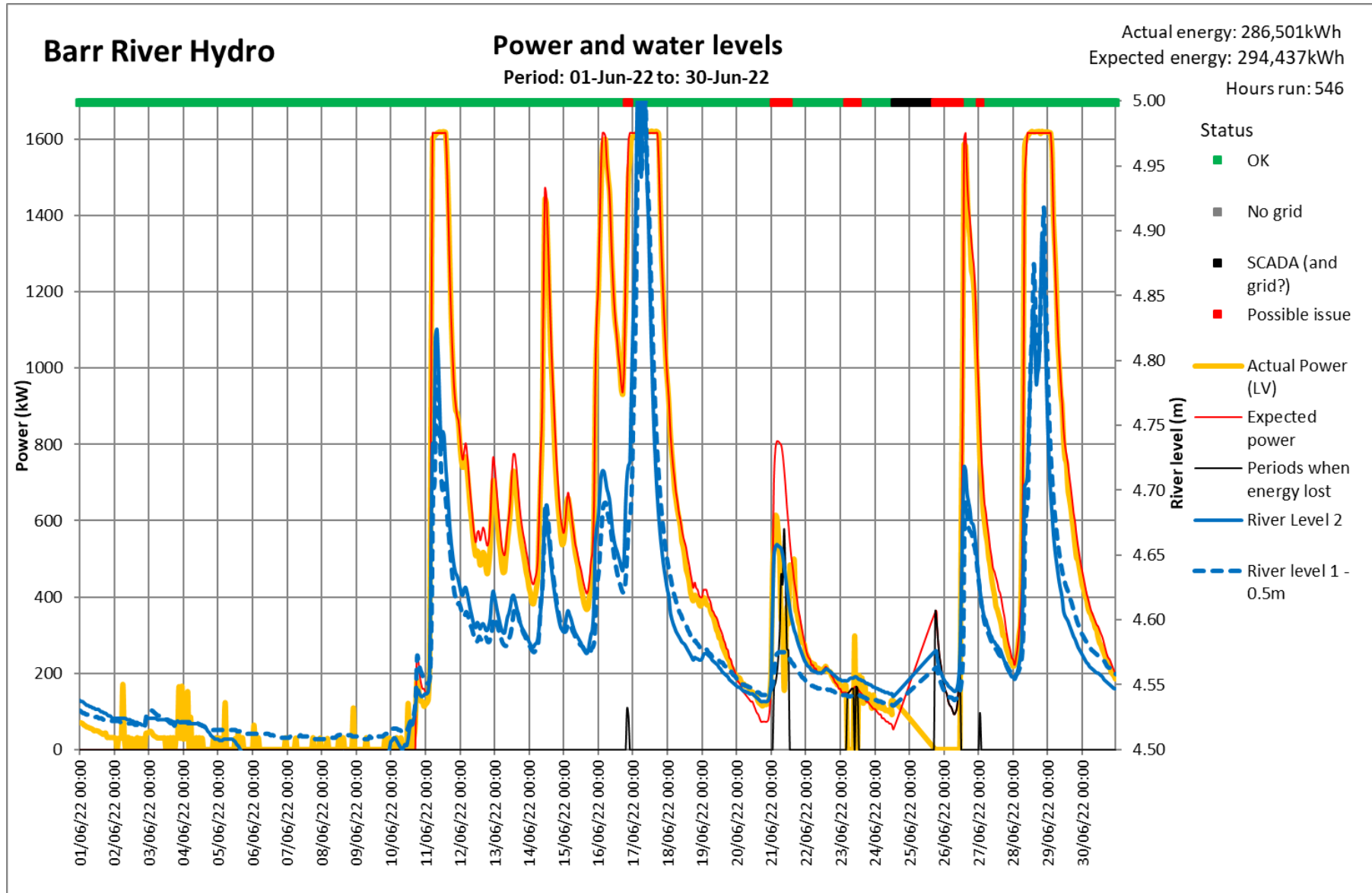
Parameter	Value
Actual generation (FIT meter), kWh	286,501
Average generation in month, kWh	286,501
Forecast generation in month (P50), kWh	188,561
Actual relative to forecast	151.9%
Rainfall relative to 1991-2020 average by month	104%
Calculated generation ¹ kWh	294,437
Actual relative to calculated generation, kWh	-7,936
Actual relative to calculated generation, %	-2.7%
Approximate revenue in month ²	£34,483

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	240,025
Variance to generation, kWh	- 46,476
Variance to generation, %	-16.2%

3 System reporting



3.1 Scheme anomalies to calculated generation

Date/time	Details	Action required
16/06/2022	Chamber 2 spilling as river 2 rose faster than river 1.	None
20/06/2022 to 26/06/2022	Chamber 1 sensor misreading.	NT & AR on site on 26/06/2022 to diagnose problem. JH changed control to chamber 2. Chamber 1 sensor replaced.
27/06/2022	Error in expected power (imperfect power vs river level relationship). No evidence of any issue with plant operation.	None

3.2 Other system events

Date/time	Details	Action required
June	Errors in export data	AR raised with Engie 4/7/2022
07/06/2022	Plant stopped sending emails due to a Gmail security issue.	JH chased CINK/Alva for resolution. Alva set up a new email account, problem resolved on 4/7/2022. Extensive discussion with CINK about responsibility for account maintenance. Finally agreed that Alva will maintain the email account.
24/06/2022	SCADA crashed	Restarted by NT on 25/6, JH emailed CINK re SCADA stability.

3.3 Head loss

Target head loss at full power	Current head loss at full power	Status
14.5m	13.89m	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	39	85	Generator winding 1	68	145
Generator NDE bearing 1	44	85	Generator winding 2	66	145
Generator NDE bearing 2	48	85	Generator winding 3	70	145
Turbine room	24	30	Power cabinet (RG1)	30	42

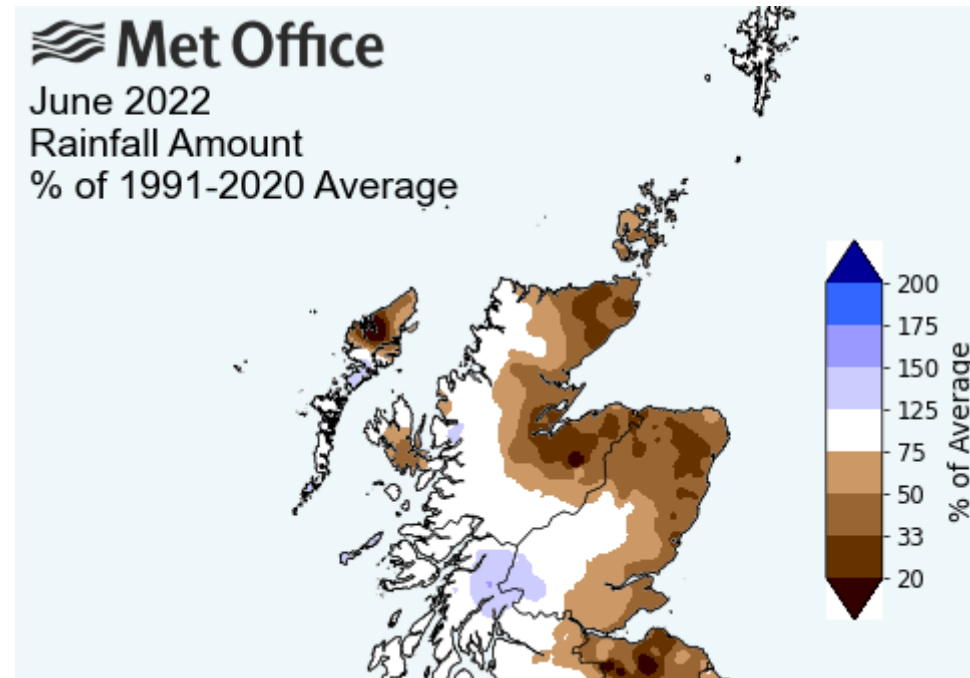
3.5 Vibration

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	1.21	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	GHC chased SSE on 07/07/2022, expecting equipment to become available the following week and will install at Barr after that. GHC to chase up.
Service to be arranged	GHC/CINK	Expected to be 21/08/2022. JH to confirm with CINK.
Caretaker training (Douglas Taylor)	GHC/MorVolts	We understand a new caretaker has been appointed and await instruction from MorVolts in relation to training/meeting.
Order replacement level sensors	MorVolts	Link to replacement sensors sent to AR.
Paint repairs required to manifold pipe	DAM	JH raised to Stuart, Stuart was to check on site. JH to chase Stuart.
Annual inspection	GHC	JH intending to attend site on 12/08/2022, JH to confirm.

5 Rainfall



Rainfall this month (rain gauge), mm	158
Western Scotland rainfall in month with respect to 1991-2020 long term average	104%

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	286,501							2,402,849
Average generation since commissioning	555,764	647,905	240,688	247,605	424,386	286,501	1,463	91,714	356,893	652,190	676,213	514,099	2,402,849
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	2,646,353
Actual relative to forecast	79.9%	116.8%	39.4%	67.0%	187.1%	151.9%							90.8%
Rainfall relative to 1991-2020 average	58.0%	163%	51%	77%	126%	104%							97%
Calculated generation kWh	494,286	664,527	241,159	253,540	432,296	294,437							2,456,945
Variance to calculated generation kWh	61,478	-16,622	-471	-5,935	-7,910	-7,936	-	-	-	-	-	-	-54,096
Variance to calculated generation %	+12.4%	-2.5%	-0.2%	-2.3%	-1.8%	-2.7%							-2.2%
Approximate revenue	£72,273	£84,255	£31,299	£29,616	£51,079	£34,483							£303,005
Capacity factor (monthly)	46.1%	59.5%	20.0%	21.2%	35.2%	24.6%							34.4%
Industry wide RoR capacity factor	52.2%	63.2%	26.7%	19.4%									40.4%

