



Barr River hydro scheme

Monthly report – November 2022

1 Summary

November was relatively wet (even for November) and the plant responded well. Generation was curtailed for approximately 36 hours due to an SSE problem. The SCADA failed again but Glen Hydro were able to confirm that the plant operation was not affected using the new direct access to the HMI. This allowed Alva to check the SCADA and they have subsequently applied a new software patch, which they are confident has resolved the problem.

2 Monthly generation & revenue

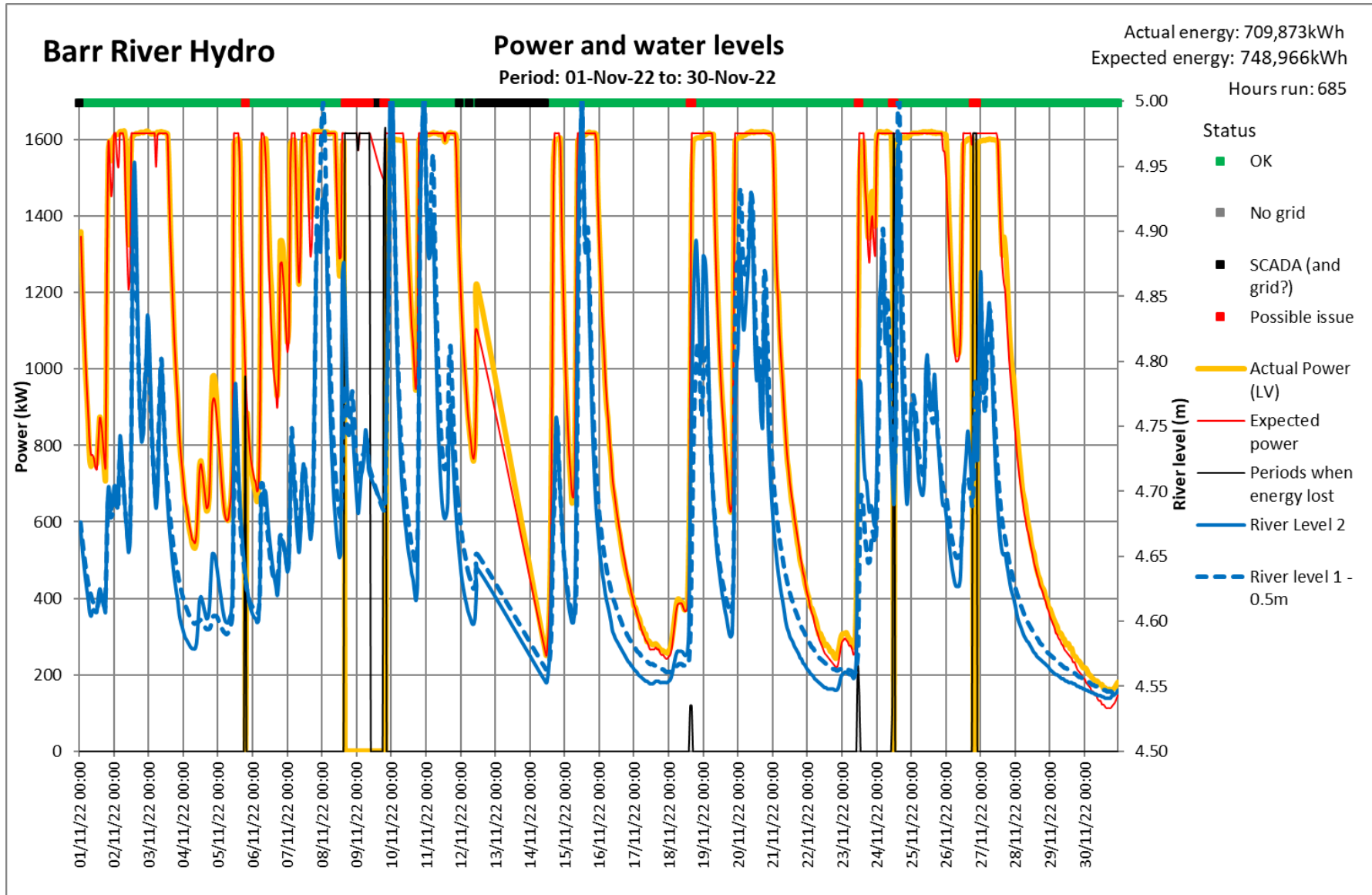
Parameter	Value
Actual generation (FIT meter), kWh	709,873
Average generation in month, kWh	693,043
Forecast generation in month (P50), kWh	618,214
Actual relative to forecast	114.8%
Rainfall relative to 1991-2020 average by month	112%
Calculated generation ¹ kWh	748,966
Actual relative to calculated generation, kWh	-39,093
Actual relative to calculated generation, %	-5.2%
Approximate revenue in month ²	£111,449

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 reported export and estimated GDUoS charges.

Export meter	Value
Export, kWh	700,099
Variance to generation, kWh	-9,774
Variance to generation, %	-1.4%

3 System reporting



3.1 Scheme anomalies to calculated generation

Date/time	Details	Action required
05/11/2022	Smoke alarm at 18:03. Plant tripped off as a result.	JH checked log data, no issues with temperatures or other evidence of problems. AR attended, checked for smells etc. Reset and restarted fine at 19:30.
08/11/2022 to 09/11/2022	SSE called, fault nearby, asked to shut down. SSE confirmed ok to restart at 20:06 on 9/11/2022	JH turned off at c. 15:30 on 8/11/2022 JH restarted at 20:20 on 9/11/2022
18/11/2022 23/11/2022	River 2 rose faster than river 1, some spilling at intake 2.	None
24/11/2022	Smoke alarm at 10:59. Plant tripped off as a result.	Reset by NT 12:18, plant restarted fine. MorVolts to take note that smoke alarm also present in switch room.
26/11/2022	Grid trip at 18:23, breaker tripped.	NT attended, reset at 21:44

3.2 Other system events

Date/time	Details	Action required
09/11/2022	SCADA not recording from 10:00 until 18:00, not clear why.	
12/11/2022	SCADA crashed at midday on 12/11/2022.	Plant confirmed as still operating by direct connection to HMI. Alva contacted, SCADA interrogated and restarted at 10:00 on 14/11/2022. Alva applied new software patch.

3.3 Head loss

Target head loss at full power	Current head loss at full power	Status
14.5m	14.05m	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	42	85	Generator winding 2	63	145
Generator NDE bearing 2	46	85	Generator winding 3	67	145
Turbine room	21	30	Power cabinet (RG1)	30	42

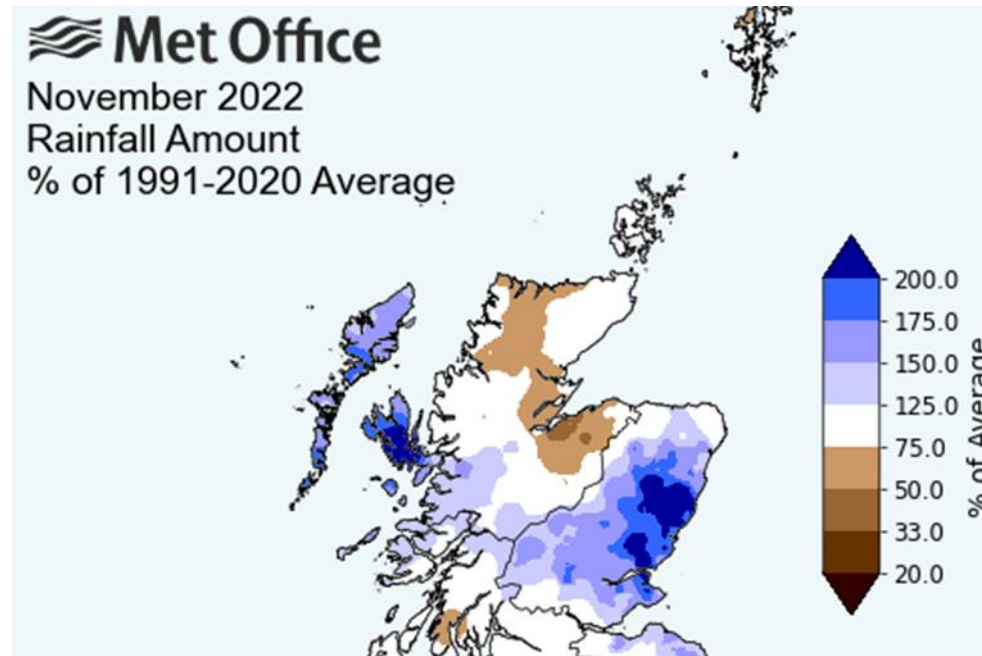
3.5 Vibration

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	0.42	3.0	Generator NDE	1.10	3.0

3.6 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 continuing to liaise with SSE. SSE have agreed and are due to fit monitoring equipment imminently, it is not clear why this hasn't happened yet. Data gathering on trips has been improved and MorVolts are now recording reports from the breaker when it is reset.
Services to be arranged	MorVolts (refer to email from John on 2/11/22)	Electrical checks (non-PAT) quotation from Enerveo (formerly SSE Contracting) accepted on 15/12/22, due to be conducted on 12/1/22. Quotation received for comms servicing and accepted. LOLER checks to be arranged, MorVolts proposing to use Scotia Handling. MorVolts to provide contact details so quotation can be requested.
Fire extinguisher testing	MorVolts	To be arranged
Caretaker training (Douglas Taylor)	GHC/MorVolts	Training conducted on site on 8/12/22.
Order replacement level sensors	MorVolts	Link to replacement sensors sent to AR. AR to confirm if these have been ordered.
Investigate meter reading errors and discrepancies in export billing	GHC	JH chased again and Engie have re-engaged. Synthesized data has been sent for all gaps identified by Engie. Confirmation of whether this data has been accepted and billed awaited from Engie. No detail provided on the source of the problem – Engie blaming the data collector.
Chase SSE for details of planned outage in 2024	GHC	SSE have provided further details, JH has forwarded to NT and AR. RH will follow up with SSEN at meeting in January.
Housekeeping in turbine house	MorVolts	Cupboard to be purchased and spares stored in there. Tools to be arranged.
Generator grease reservoir almost empty	MorVolts	Grease reservoir to be refilled with AGIP GR MU EP2 (there should be cartridges in the box)
Teamviewer licence issues	MorVolts	Licence issues prevented access to SCADA by Glen Hydro (John can connect ok, but others receive a licence error) and Douglas. Nick to check licence situation and advise.

4 Rainfall



Rainfall this month (rain gauge), mm	349
Western Scotland rainfall in month with respect to 1991-2020 long term average	112%

5 Scheme annual performance summary

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					3,186,293
Average generation since commissioning	247,605	424,386	286,501	165,261	174,610	297,736	672,489	693,043	512,649	555,764	647,905	240,688	2,961,629
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	2,848,710
Actual relative to forecast	67.0%	187.1%	151.9%	168.6%	91.8%	61.6%	118.9%	114.8%					111.9%
Rainfall relative to 1991-2020 average	77%	126%	104%	74%	65%	93%	134%	112%					98%
Calculated generation kWh	253,540	432,296	294,437	330,341	257,587	239,724	700,013	748,966					3,256,904
Variance to calculated generation kWh	-5,935	-7,910	-7,936	-1,283	-82	-1,146	-7,226	-39,093	-	-	-	-	-70,611
Variance to calculated generation %	-2.3%	-1.8%	-2.7%	-0.4%	-0.0%	-0.5%	-1.0%	-5.2%					-2.2%
Approximate revenue ¹	£28,994	£50,244	£33,677	£38,789	£30,177	£27,894	£108,061	£111,449					£421,250
Capacity factor (monthly)	20.5%	39.0%	23.8%	28.2%	21.4%	20.5%	57.5%	60.9%					33.6%
Industry wide RoR capacity factor	19.4%	34.6%	18.3%	15.5%	15.5%	11.9%	55.8%						24.4%

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

