



# Barr River hydro scheme

## Monthly report – March 2022

### 1 Summary

March was relatively dry with barely any rain at all for the second half of the month, this led to generation for the month being significant below forecast. The plant availability and performance was good throughout the month. There were a couple of occasions of heavy showers making river 2 rise much faster than river 1 with short periods of underperformance until the plant reached maximum power.

### 2 Monthly generation & revenue

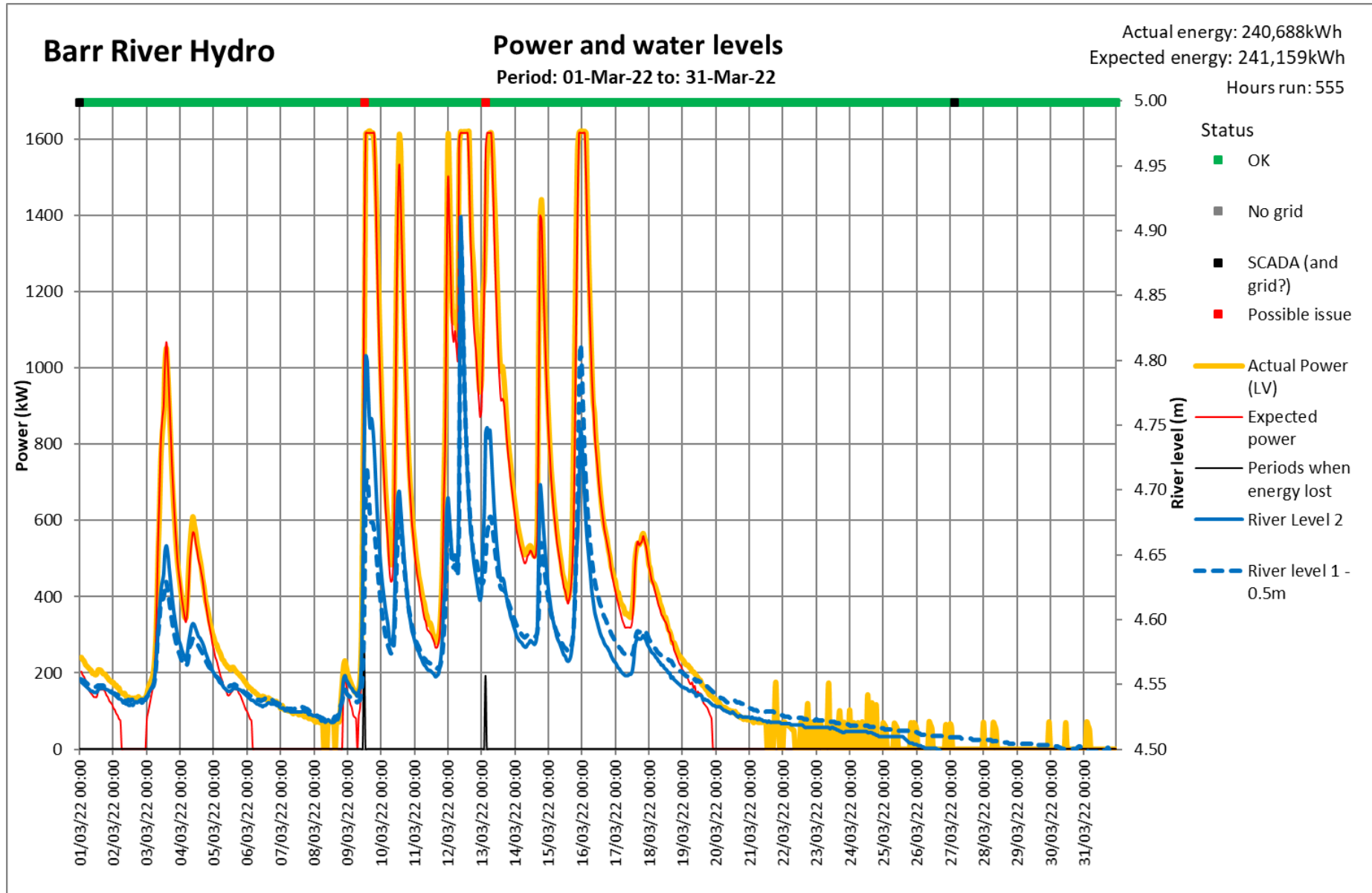
Parameter	Value
Actual generation (FIT meter), kWh	240,688
Average generation in month, kWh	240,688
Forecast generation in month (P50), kWh	611,047
Actual relative to forecast	39.4%
Rainfall relative to 1991-2020 average by month	51%
Calculated generation <sup>1</sup> kWh	241,159
Actual relative to calculated generation, kWh	-471
Actual relative to calculated generation, %	-0.2%
Approximate revenue in month <sup>2</sup>	£31,299

<sup>1</sup> 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.

<sup>2</sup> Export revenue based on generated output and estimated export rate.

Export meter	Value
Export, kWh	244,241
Variance to generation, kWh	3,553
Variance to generation, %	1.5%

### 3 System reporting



### 3.1 Scheme anomalies to calculated generation

Date/time	Details	Action required
1/3/22	SCADA not logging for first few minutes, recovered by 00:05.	None
9/3/22	River 2 rose faster than river 1, chamber 2 spilling from 10:46 to 12:36.	None
13/3/22	River 2 rose faster than river 1, chamber 2 spilling from 00:46 to 05:02.	None
27/3/22	Gap in SCADA log between 02:00 and 03:00 (GMT to BST change).	None

### 3.2 Other system events

Date/time	Details	Action required
2/3/22	Grid trip, automatically reconnected.	None
15/3/22	Grid trip, automatically reconnected.	None
25/3/22	Grid trip, automatically reconnected.	None
22/3/22 – 31/3/22	Unusual behaviour when plant operating at low water levels. Instead of running until chamber empty then stopping, plant continued to run and drained pipeline on several occasions and then tripped on either level sensor fault or penstock pressure.	Minimum chamber levels increased on several occasions, but no effect. Evidence sent to CINK for comment, awaiting response.

### 3.3 Head loss

Target head loss at full power	Current head loss at full power	Status
14.5m	13.07m	Marginal increase from previous month. Better than specified (as expected for a new pipeline).

### 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	31	85	Generator winding 1	59	145
Generator NDE bearing 1	34	85	Generator winding 2	57	145
Generator NDE bearing 2	37	85	Generator winding 3	60	145
Turbine room	16	30	Power cabinet (RG1)	29	42

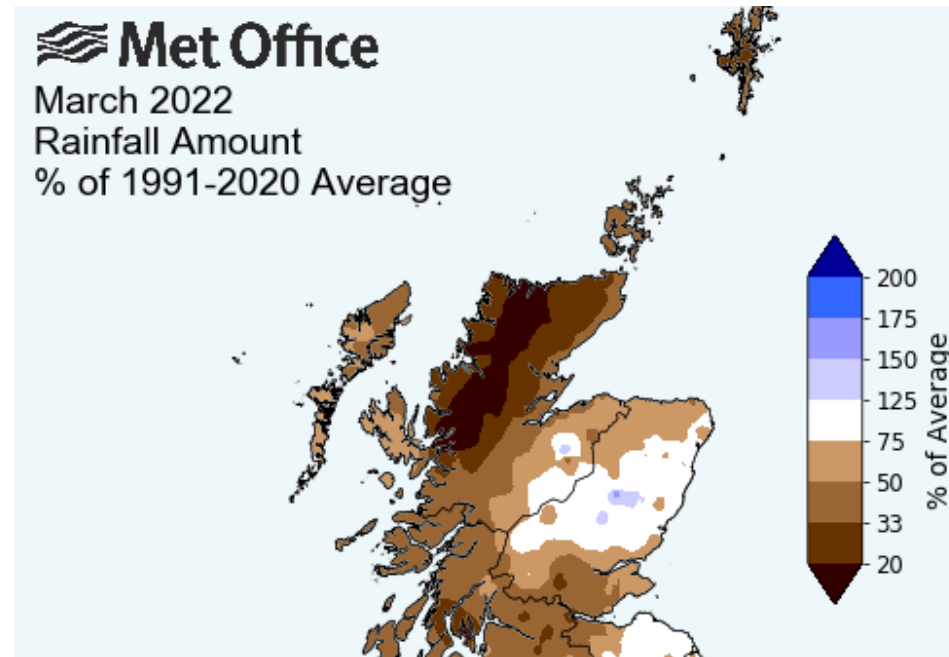
### 3.5 Vibration

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	0.46	3.0	Generator NDE	1.12	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
More fuses to be ordered	MorVolts	Ongoing
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 have agreed to provide equipment when available (expected to be mid May). GHC to chase up.

## 5 Rainfall



Rainfall this month (rain gauge), mm	98
Western Scotland rainfall in month with respect to 1991-2020 long term average	51%

## 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										555,764
Average generation since commissioning	555,764	647,905	240,688				1,463	91,714	356,893	652,190	676,213	514,099	555,764
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	695,941
Actual relative to forecast	79.9%	116.8%	39.4%										79.9%
Rainfall relative to 1991-2020 average	58.0%	163%	51%										8.3%
Calculated generation kWh	494,286	664,527	241,159										494,286
Variance to calculated generation kWh	61,478	-16,622	-471	-	-	-	-	-	-	-	-	-	61,478
Variance to calculated generation %	+12.4%	-2.5%	-0.2%										+12.4%
Approximate revenue	£72,273	£84,255	£31,299										£72,273
Capacity factor (monthly)	46.1%	59.5%	20.0%										46.1%
Industry wide RoR capacity factor	52.2%												#DIV/0!

