



# Reading Hydro CBS Ltd

**Annual General Meeting 2023**  
29th March 2023



# Update on recent activities

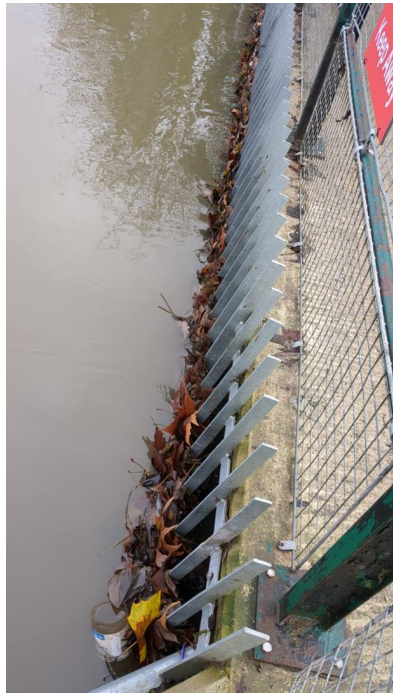


# Operations

*Jeremy Thake, Operations director*

1: Operation & maintenance →

2: Clearance



3: Repair

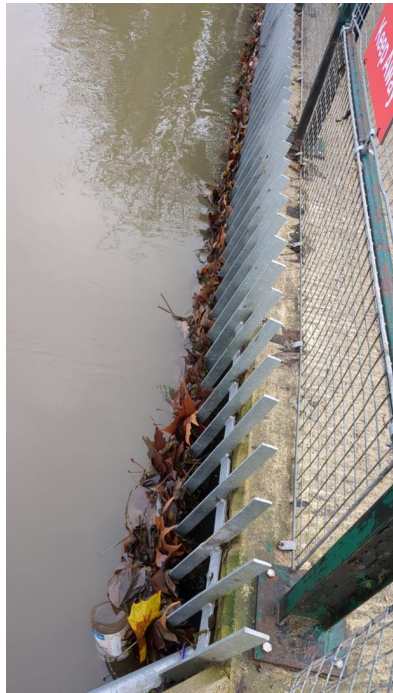


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# How the Archimedes Screw works



Driven by gravity.

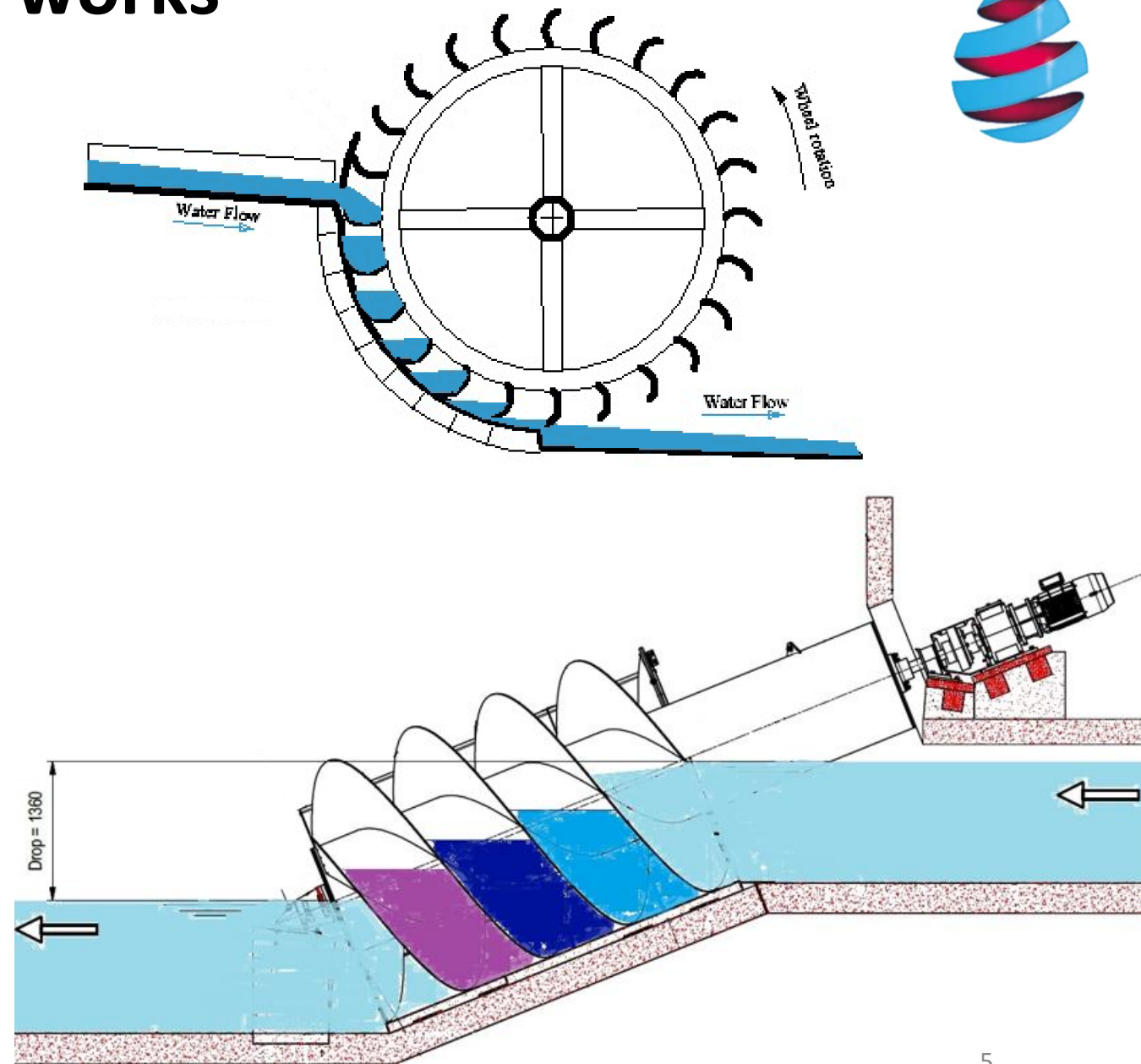
Very similar to a water wheel, only the 'buckets' slide sideways as they go down.

About 2.1 tonnes of water is trapped in 'buckets' between the turns of the spirals (coloured sections in diagram), and there are 4.3 'buckets' in our screw, so a total of 9 tonnes of water is being lowered at any one time (in each screw).

Power is proportional to head (drop) x flow.

$$P = H \text{ [m]} \times Q \text{ [m}^3\text{/s]} \times \rho_{\text{water}} \text{ [kg/m}^3\text{]} \times g \text{ [m/s}^2\text{]} \times \eta$$

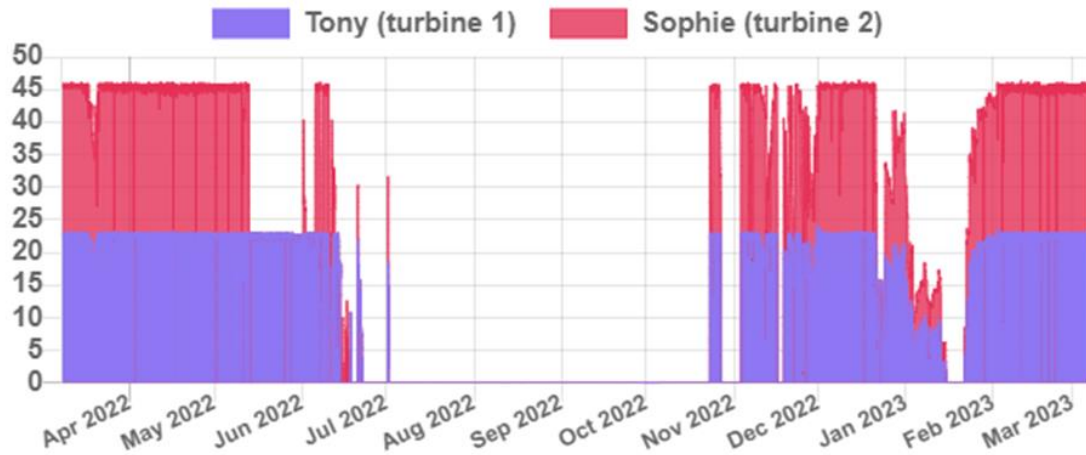
The efficiency ( $\eta$ ) from energy in the water into the screw to electrical energy out is about 77% (water to wire).



# Why the power is not always 46kW



Power (kW)



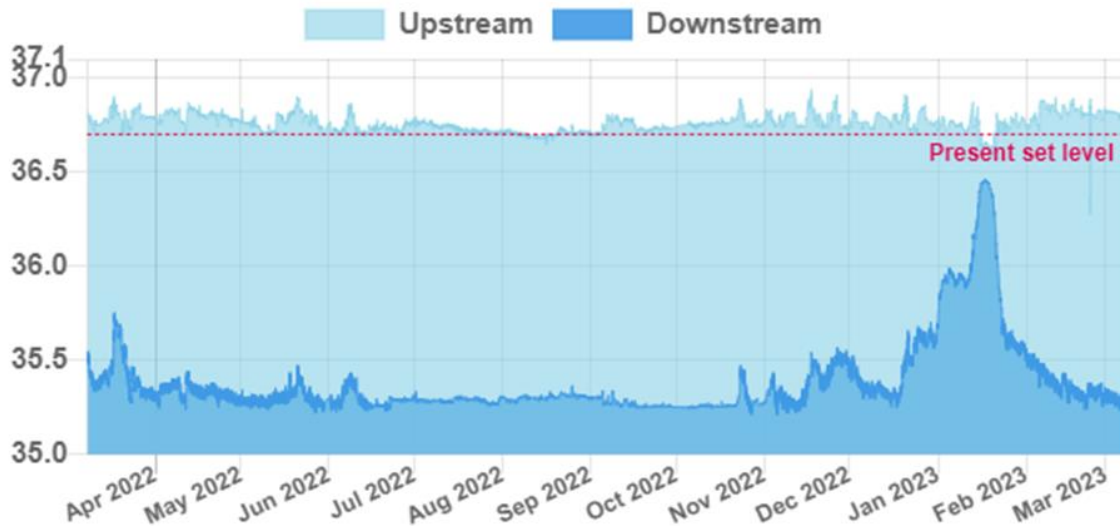
Provided we have head & flow, and the machinery is working, we are OK. But sometimes we have...

**Drought (insufficient flow)** – we stopped generating on 26 Jun 22, restarted 24 Oct 22, full power from 2 Nov 22.

**Flood (insufficient head)**

- Reduced power at the end of Dec 22
- Shutdown 15 Jan 23
- Restarted 21 Jan 23
- Slowly built back up to full power early Feb 23
- Reduced head from 23 March 23 with recent rain.

Water levels (metres AOD)



## Breakdowns

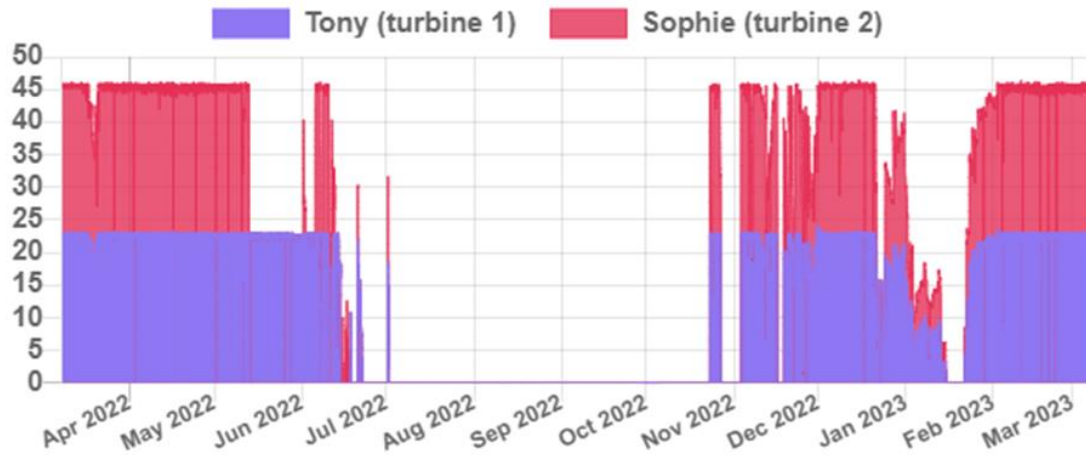
- Upper bearing failure: 13-30 May 22
- RCD failure: 16-19 Nov 22

**Planned maintenance** (1, 3, 6, and 12-monthly) requires shutdowns of a few minutes to a few hours.

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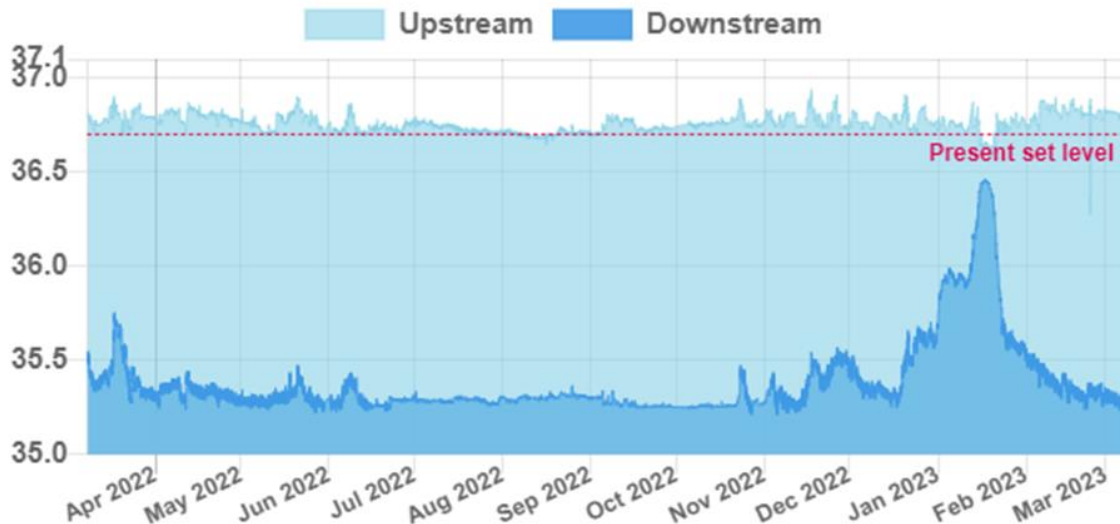
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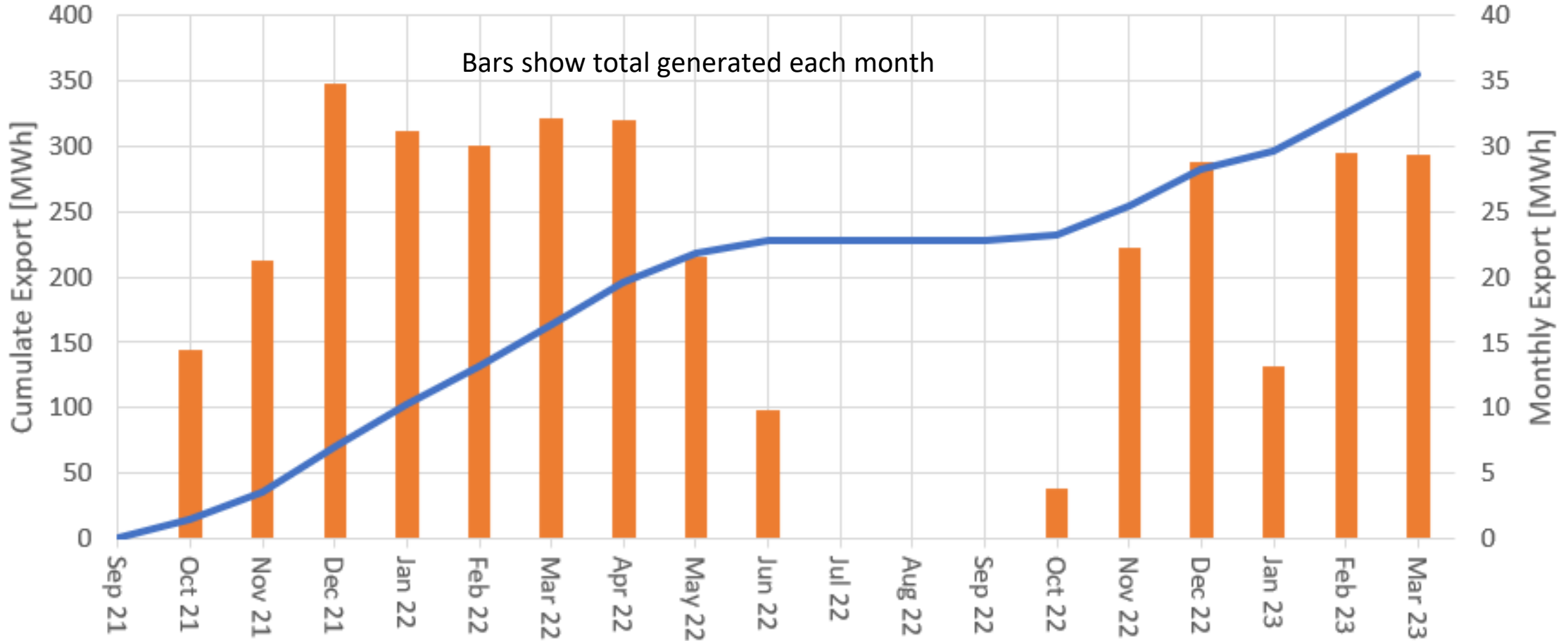


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# Output since we started generating

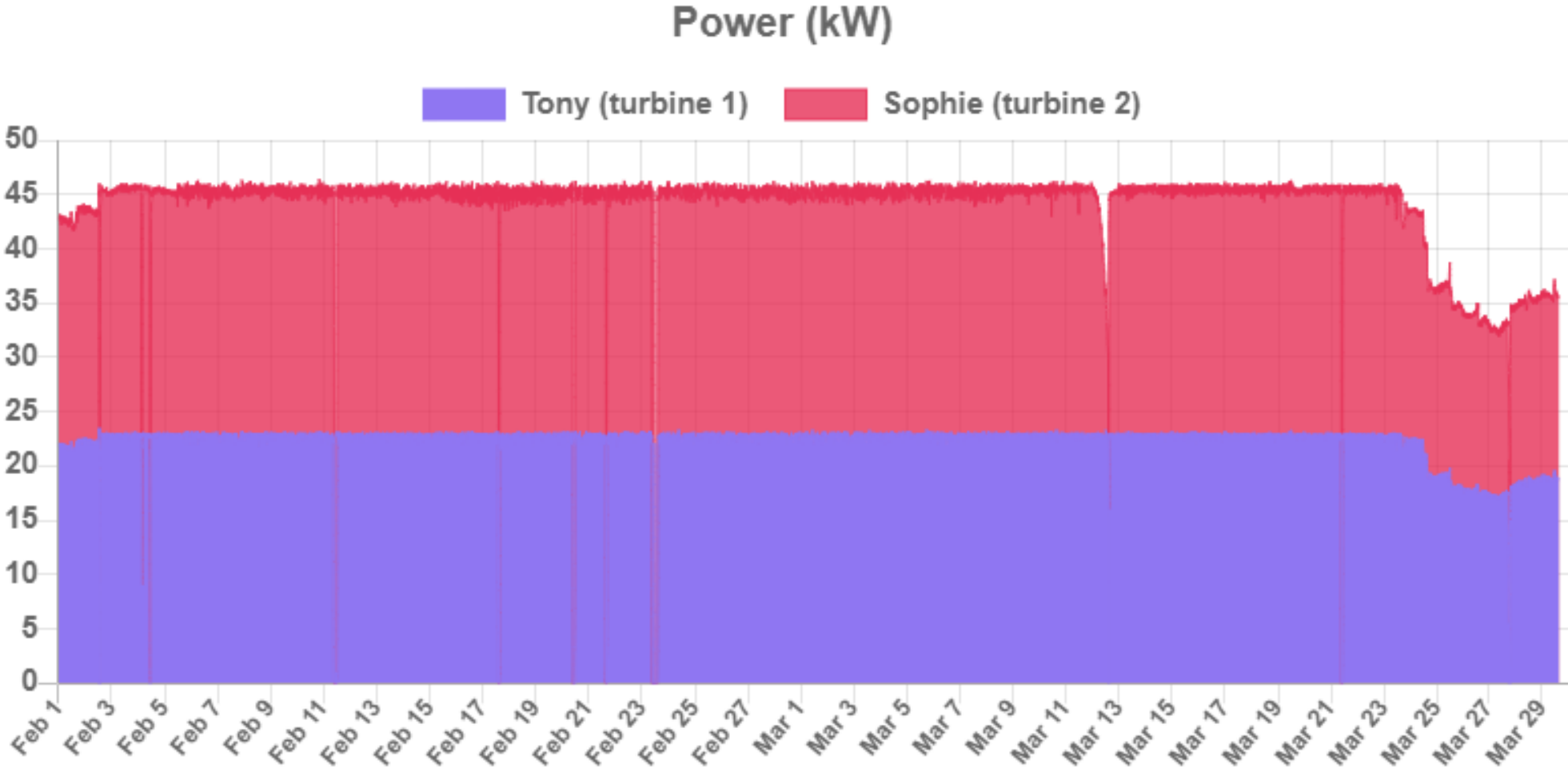


Capacity factor last year was 48% (March 2022-February 2023)

Business plan assumes 78% in an average year, based on 26 years of historical data.



From February:  
more 'normal' performance, but reduced head from last week

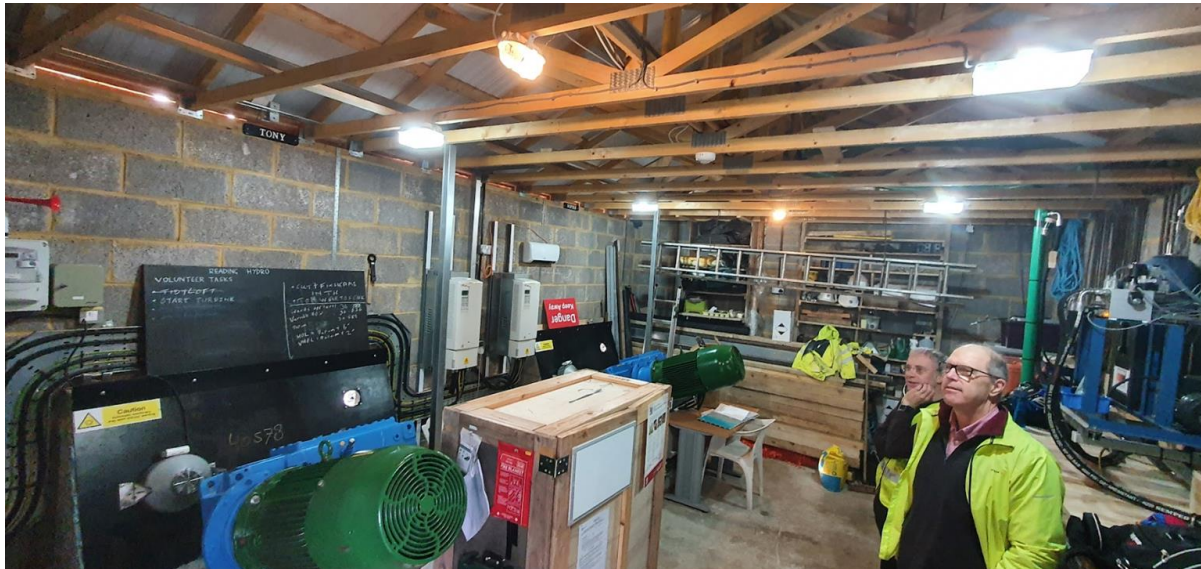


Graph from [www.readinghydro.org/data/](http://www.readinghydro.org/data/)

# Maintenance



Stoplogging and pumping out for the bearing replacement.

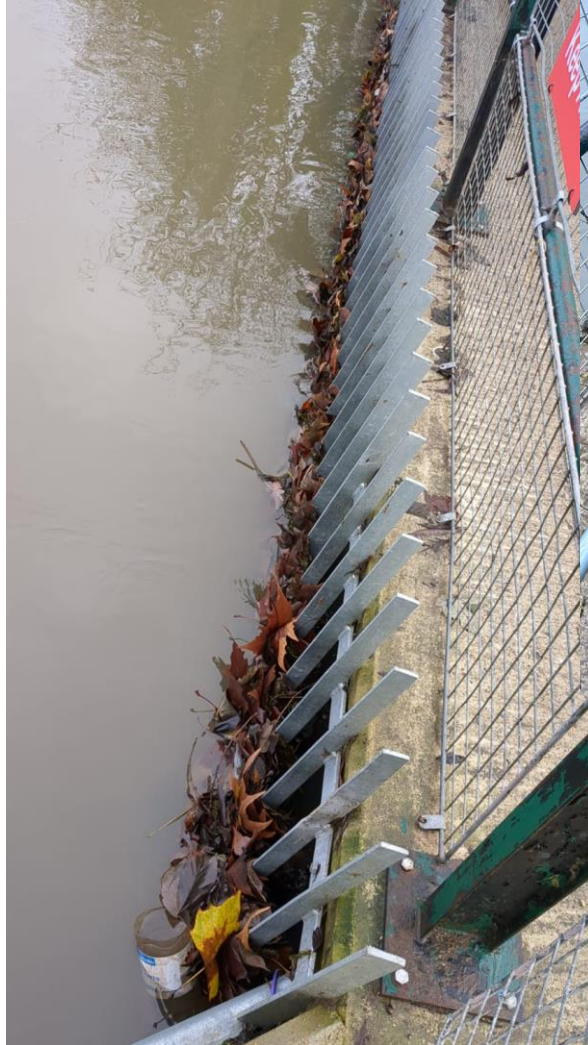


11 Operation & Maintenance Leads volunteers

Quarterly checks

# Clearance

19 Clearance  
volunteers:  
5 leads,  
14 assistants

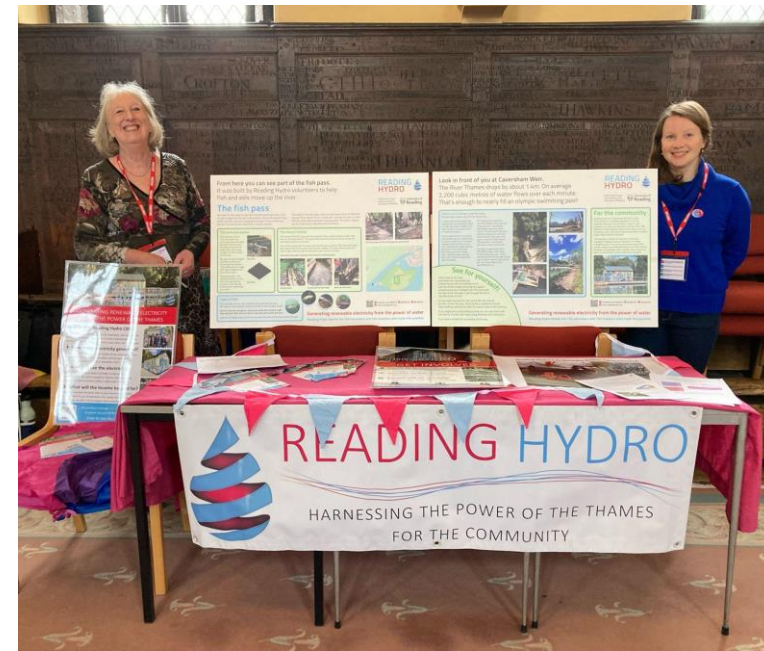


# Education

Erica Purvis, Education lead



Talk to Beaver group



Stall at *Beyond COP21* Schools Symposium.

# Where can Reading Hydro contribute?



## Renewable energy and demand reduction

What it is, why we need it, why it's good, how to design and implement



## Climate Change

What causes it, how it impacts communities round the world, the need to mitigate and adapt.

## Wildlife and water

Caring for biodiversity and wildlife in and near our waterways.



## Community action

Showing how people can come together to create change for something they care about.



# What are we doing?

Seven core volunteers



Talks on site to Primary schools, Beavers, Uni Students.  
Online discussion with school's green council.



Stalls and talks at events.



Developing resources for STEM, history and other subjects (webpage, slides, worksheets, wordsearches).

Building local links - Reading Museum, The Mills Archive, Libraries, Reading University.



# Volunteering

Juliet Hanfling, People director



With particular thanks to



Tony

Sophie





# But we still need more volunteers





# Could this be you?

We are currently looking for:

## **Compliance Team:**

Compliance Lead, Controlled Document Coordinator

## **Communications and Education Teams:**

Events Coordinator, Visits Coordinator

## **Digital Team**

Data Engineer, Database specialist

Find out more on the GET INVOLVED page of our website or email me on: [volunteer@readinghydro.org](mailto:volunteer@readinghydro.org)