

Mary Tavy Power Station

Green energy from
Dartmoor

Welcome to Mary Tavy Power Station

Historic renewable energy pioneers

Mary Tavy hydro-electric power station harnesses the forces of nature to generate green energy for South West Water – enough to serve 1700 houses.

Still in active service today, the hydro-electric turbines were built in the 1930s by enterprising industrialists who recognised that the water resources and old mining sites in the area could be used for electricity production.

At one time England's largest hydro-electric power station, Mary Tavy is now small compared with more recent plants. But it provides a fascinating insight into how hydro-electric generation has developed over the decades.

Fact file: the pioneers

Electricity installers the Christy brothers spotted the potential of using declining mining industry assets for hydro-electric generation.

They bought the water rights from the Wheal Jewell and Mary Tavy Mining Company and in July 1932 the West Devon Mining and Power Company was incorporated as a wholly owned subsidiary of the statutory West Devon Electricity Supply Company Ltd.

How it works

Water is fed into Mary Tavy Number One Water Plant from the River Tavy at Hill Bridge via a water channel known as a leat, built for the mining industry. The water is then collected in the nearby Wheal Bennetts Reservoir before entering a 36 inch pipe and dropping 230 feet to power the three turbines. The electrical energy generated joins the National Grid.

Fact file: Number One Plant

- Wheal Bennetts Reservoir holds 2.5million gallons.
- The three Francis turbines drive three Crompton Parkinson alternators at speed of 1,000 revolutions per minute (rpm).
- They produce a total of 710 kilowatts at 415 volts.
- An oil-filled transformer steps the voltage up to 11,000 volts.

Demand for electricity grew, and in 1936 the West Devon Mining and Power Company built a second hydro scheme at Mary Tavy.

Number Two Water Plant takes water from Tavy Cleave, close to the source of the River Tavy. Water runs along a 200-year-old leat to Wheal Jewell reservoir, then through pipes into the turbines.



Fact file: Number Two Plant

- Tavy Cleave is 1,100ft above sea level.
- Wheal Jewell Reservoir holds 16million gallons of water.
- Water is fed through a 39 inch internal diameter ductile iron pipe.
- Three Pelton Wheel turbines drive three 650kw English Electric alternators at a speed of 428 rpm.
- Close-coupled transformers step the voltage up from 420 volts to 11,000 volts.
- The three machines are synchronised to the National Grid.

The science

The turbines are like water wheels which provide the torque to drive the alternators. If a magnet is passed over a coil of wire a voltage is generated.

This is the principle operation of the alternator, which produces the electricity.

The transformers are giant versions of the ones we all have in our homes to charge our mobile phones and ring our doorbells.



South West Water and renewable energy

We are now the custodians of this pioneering historic industrial site and have added it to our portfolio of renewable energy plants. It generates some £½million each year, helping us keep our costs down.

Looking after the leats and reservoirs that feed the power plant helps us manage the wider water catchment and means that we retain specialist skills in hydro-electric power.

Generating energy from water power at reservoirs and biogas generators at some of our sewage treatment sites enables us to exploit existing but under-used energy sources and keep our costs down.

We plan to double our energy production from renewable sources by 2015, with a longer term plan to obtain 50% of our energy needs from renewable sources by 2050.



The leats team outside the canal tunnel entrance