

Going Underground

# Tunnel boring machines



## Overview

While on the original Snowy Scheme, tunnelling was achieved through drill and blast (and, in some cases, picks and shovels) during construction of Snowy 2.0 the bulk of the underground excavation will be carried out by large tunnel boring machines, or TBMs. As part of Snowy 2.0, there will be approximately 40km of tunnels dug, with the majority of the excavation being completed by three TBMs.



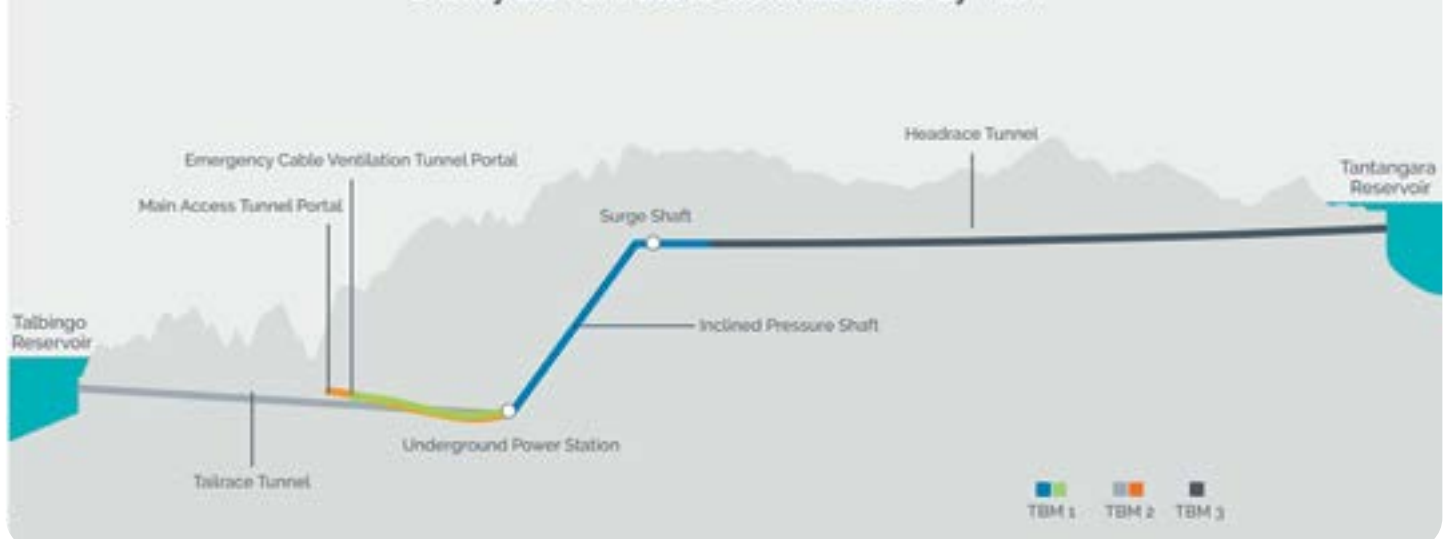
## Fast fact

Each of the three Snowy 2.0 TBMs has been designed to manage the various factors they will encounter throughout construction. Some of the key factors in the TBM designs have included:

- the geology of the rock
- the diameter of the tunnels
- the angle of the tunnel

Did you know? There is a convention for TBMs to be given female names, a tradition stemming from the 1500s. They must be named before they are launched.

### Snowy 2.0 tunnels to be excavated by TBM



## TBM 1



- TBM 1 will excavate the Emergency, Ventilation and Cable Tunnel from the surface in Lobs Hole down to the power station complex. From there, it will tunnel the inclined pressure shaft, linking the headrace tunnel (the upper waterway tunnel) to the large turbines within the power station
- TBM 1 is designed to bore through hard rock
- Constructed in Germany by Herrenknecht AG
- It can excavate both uphill and downhill
- At 205m in length (that's the equivalent of two rugby league fields), it will be one of the longest TBMs in operation around the world
- TBM 1 will have a diameter of around 11m (the same as a three-storey building) and will be able to excavate up to 30m of rock per day

## TBM 3



- Constructed in Germany by Herrenknecht
- TBM 3 is 142m long, with a 11m diameter
- It will excavate 16km of the headrace tunnel
- TBM 3 can operate in 'slurry mode' when required, mixing bentonite and water into the fine excavated rock, forming a 'slurry' that can be pumped back to the surface for treatment. This will ensure that rock dust doesn't become airborne, keeping our workers safe!
- TBM 3 is expected to tunnel around 30m of rock per day, however, if rock conditions are favourable, we may see this increase to 50m per day

## TBM 2

- TBM 2 will excavate the Main Access Tunnel from the surface in Lobs Hole down to the power station complex. From there, TBM 2 will be dismantled underground and reassembled at the Talbingo Portal. It will then be shifted on a concrete cradle along the 700m-long Talbingo construction adit before being relaunched underground to excavate the tailrace tunnel
- Constructed in China by CREG
- TBM 2 is also designed to excavate hard rock and is 137m long
- It will be the first TBM to be launched on the project and is the only machine that will excavate two separate tunnels
- TBM 2 will have a diameter of around 11m and will be able to excavate up to 30m of rock per day

