CONSTRUCTION DETAILS | BEHIND THE CONSTRUCTION FENCE | SUSTAINABILITY

Mission Forbach: A mountain as an energy reservoir

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Civil engineering/ Infrastructure

A project is underway in the Schwarzwald that will make the energy transition possible. A look behind the construction fences shows how PORR is converting the Rudolf Fettweis plant into a sustainable pumped storage power station. A far-reaching project.

It is early morning in the Murg Valley. You can hear the water rushing. Fog hangs in the mountains. And deep inside the rock, PORR is converting the Rudolf Fettweis plant into a high-performance pumped storage power station. It is one of the most important energy projects in Baden-Württemberg. Since the beginning of 2024, we have been working underground on behalf of Energie Baden-Württemberg AG to build a plant of extraordinary dimensions that will store electricity flexibly and thus contribute to stabilising the energy system.

The first year

January 2024. The construction site is a secured slope with safety fences, rock protection and safety nets. Then the pre-cuts are made. And we are already digging into the mountain. On 10 April, we start driving the Schutter tunnel. After around 278 metres, we reach the secondary tunnel V. This will become the main logistical artery for the removal of the excavated material. In July 2024, we start driving the access tunnel. The federal roads B462 is in the way. But we realise a subway using a pipe umbrella method. Two months later, the connection to the future power plant cavern is established. In August, work starts on driving the power transmission tunnel, which will later be used to lead the cables from the travo-cavern to the surface. At the same time, the first work on the side tunnels, which will serve as part of the future water storage system, is underway. In September, we begin driving the calotte in the power station cavern - the central structure of the project. By the end of the year, we are be able to start the anchoring work to secure the future crane runway.

The year of breakthroughs

2025 brings many decisive moments. On 13 January, the breakthrough of the energy dissipation tunnel to the cavern takes place. At the same time, we are able to finalise the crown drive and the anchoring of the crane runway. We then continue with the formwork, reinforcement and concrete work. On 4 February, the tunnel stop at the access tunnel to the Schwarzenbachwerk takes place. This takes us to the throttle valve chamber, from which we construct a shaft around 350 metres deep using the raise-boring method. This initially involves drilling a pilot bore, which is later widened from the bottom to the top with a reamer to a final diameter of 3.1 metres. We complete the pilot bore on schedule, the widening starts a few days later and is completed on 1 August. At the same time, almost the same thing is happening in the Murgwerk: on 13 May, the tunnel stop for the access tunnel is completed there. From the throttle valve chamber, we create a shaft around 150 metres deep using the raise-boring method. The pilot bore starts on 18 August and is completed just five days later. The widening drilling begins on 25 August. The centrepiece of the project is the power station cavern. Once the crane runway beams have been completed and the crane has been lifted into place, driving begins in the cavern's galleries on 2 May. In July, a breakthrough is made from the cavern into the underwater tunnel of the mine. Shortly afterwards, in August, we also manage the breakthroughs into the much deeper upper and underwater tunnels of the Schwarzenbachwerk. These connections ensure that the storage power station works.

The dimensions of the cavern are now becoming apparent: with an excavated volume of around 50,000 cubic metres and a degree of completion of around 92%, the underground work in this section is well advanced. The material logistics figures are also impressive: A total of around 900,000 tonnes of excavated material will be removed by mid-2025. The majority is being used in the Raumünzach quarry, where the material can be installed. The close logistical integration between excavation, transport and reuse is crucial for the smooth progress of construction.

The coming years

September 2025. We complete tunnelling in the cavern. With the ongoing completion of the shaft systems, the start of concrete construction in the cavern - in the Murg and Schwarzenbach works - and the breakthroughs already achieved in the tunnels, the essential foundations of the project have been laid. At the beginning of November 2025, the first intake pipes for the Murgwerk turbines are also installed by a downstream contractor. The construction project is therefore on schedule. And when the modernised pumped storage power plant goes into operation in 2027/2028, Forbach will not only store electricity - it will also give Baden-Württemberg the flexibility it needs to cushion peak loads and keep the grids stable. A construction project of the century is taking shape. Deep in the mountain. Silent, precise, unstoppable.