

A lake that stores energy

Expansion of the Wurten Reservoir in Austria increases storage capacity, providing greater flexibility in electricity supply

Major construction project at 1,700 metres above sea level

STRABAG is expanding the Wurten Reservoir in Carinthia for energy provider Kelag. The project is an impressive achievement by the STRABAG units working in challenging Alpine terrain. The works will raise the rockfill dam by seven metres, allowing the reservoir's water level to rise by a further 8.5 metres. This will almost double the lake's storage capacity from 2.7 million to five million cubic metres – equivalent to roughly 2,000 Olympic-sized swimming pools.

The Wurten Reservoir forms part of Kelag's Fragant Hydropower Complex in the Möll Valley, an extensive system comprising 15 reservoirs, around 79 kilometres of waterways and ten power plants, as well as numerous tunnels and pipelines. The complex generates around 800 million kilowatt-hours of electricity, theoretically enough to meet the annual needs of 225,000 households.

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At a glance:

- **New storage capacity:**
5 million m³ of water
- **Investment:** € 30 million
- **Construction period:**
spring 2025 to winter 2026,
remaining works in 2027
- **STRABAG units involved:**
 - STRABAG Civil Engineering
 - STRABAG Transportation Infrastructures
 - STRABAG Ground Engineering

A different kind of refurbishment

At the heart of the project is the raising of the existing rockfill dam, which was built in the late 1960s. Around 230,000 cubic metres of material was extracted by blasting from a quarry at the head of the reservoir. The material was then processed and reused to raise the dam, placed and compacted layer by layer on the downstream side.

Raising the dam also means that numerous existing structures have to be adapted to the reservoir's new maximum water level. STRABAG is renewing access to the bottom outlet valve chamber, the roller gate structure used to regulate water flow, the surge tank and the spillway, which provides flood protection.



1 Some of the construction machinery had to be transported to the site along narrow roads with steep gradients. © ZÜBLIN /
2 The bored piles were fabricated with centimetre precision. © ZÜBLIN

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High-performance storage systems are key to the success of the energy transition. Together with Kelag, and drawing on our expertise in high-altitude and hydraulic engineering, the expansion of the Wurten Reservoir dam has enabled us to help advance a reliable and sustainable energy supply for the region.

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Franz Redl,
Member of the Management Board,
STRABAG AG Austria

Drained completely – twice

Working at an elevation of 1,700 metres presents a considerable logistical challenge for the STRABAG units involved. Some of the large construction machinery had to be transported along a narrow road with gradients of more than 10%. The changeable mountain weather also poses challenges for the colleagues working on site.

ZÜBLIN Ground Engineering installed and completed 246 bored piles on schedule. The piles extend as much as 25 metres into the ground, with a grout curtain beneath them reaching depths of up to 45 metres – a challenging task given the difficult ground conditions. Combined, the bored piles have a total drilling length of around 2.8 kilometres. They are essential to ensuring a watertight foundation beneath the dam. Their installation demanded exceptional precision: drilling had to remain within a tolerance of 1%. More than one metre in diameter, the piles overlap because they are wider than the spacing between the boreholes. The project team therefore had to work to centimetre-level accuracy. A final capping beam and integrated waterstop create a new sealing layer that reliably prevents water from passing beneath the dam.





How does hydropower work?

There are several different types of hydropower plant. Run-of-river plants continuously generate electricity using flowing water. Storage hydropower plants, by contrast, collect water in a reservoir and release it as needed to generate electricity. Pumped-storage power plants work in both directions. To generate electricity, water flows from an upper reservoir through the plant's turbines, driving them as it passes. When there is surplus electricity in the grid, the water is pumped back up into the upper reservoir. The greater the height difference between the upper reservoir and the turbines, the more electricity can be generated. The reservoirs of the Fragant Hydropower Complex are located at elevations ranging from 500 to 1,700 metres.

The reservoir had to be drained completely on two occasions for the works – once last year and again at the beginning of 2026. Before the onset of winter in 2025 it had to be refilled to allow limited reservoir operation to continue. Seventy colleagues from different STRABAG units worked every day, and in some cases at night, to complete the first phase on schedule by the end of 2025.

Comprehensive nature conservation measures are being implemented alongside the construction works. To compensate for areas that will be affected by the higher future water level, Kelag is creating more than four hectares of replacement habitat. This includes a 1,000-square-metre amphibian habitat at the head of the reservoir as well as further compensation areas in Flattach and Friesach. Once the main construction works are completed in 2026, remaining works and recultivation measures will follow in 2027.



3 The rock-fill dam is being raised by seven metres. © STRABAG

Hydropower as renewable energy

The Wurten Reservoir occupies a central position within Kelag's Fragant Hydropower Complex and serves as the lower reservoir for the Feldsee Pumped-Storage Power Plant. Water from the upper Feldsee Reservoir can be released through the Feldsee Pumped-Storage Power Plant to generate electricity before flowing into the Wurten Reservoir. Conversely, water from the Wurten Reservoir can be pumped back up into the Feldsee Reservoir. Water from the Wurten Reservoir can also be channelled to the Innerfragant Power Plant for electricity generation.

With its various reservoirs located at different elevations, the system operates like a cascade. The Wurten Reservoir is one of the high-altitude reservoirs, storing water over longer periods and allowing electricity to be generated through pump turbines whenever required. This enables the system to respond rapidly to the needs of the electricity grid.

Energy storage for a secure supply

Modern energy infrastructure relies on generating green electricity, and Austria is already one of Europe's leaders in this area. Around 82% of gross electricity generation came from renewable sources in 2025, with hydro-power accounting for the largest share at 51%. On many days, Austria can already meet a large proportion of its electricity demand from renewable energy. But when hydropower generation is insufficient, the skies are overcast or there is little wind, electricity has to be imported or fossil-fuelled power plants brought into use.

Energy storage is therefore becoming increasingly important, allowing electricity to be used more flexibly. Reservoirs offer considerable potential as natural batteries, helping to make regional electricity supplies more reliable, secure and affordable. By expanding reservoirs and increasing their capacity, STRABAG is contributing to a sustainable energy infrastructure.



4 The flood funnel is used for flood protection.
© STRABAG / 5 The Wurten Reservoir
seen from above. © ZÜBLIN

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The Wurten Reservoir plays a key role within the Fragant Hydro-power Complex. By almost doubling its storage capacity to five million cubic metres, we are significantly increasing the flexibility of our power generation while also strengthening security of supply. The project is an important building block for a sustainable and future-proof energy system. With an investment of around € 30 million, we are creating additional storage capacity for the efficient use of renewable energy.

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Reinhard Draxler,
Member of the Management Board
Kelag



Contact

Maximilian Rutar
Construction Manager
Transportation Infrastructures

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