

HIGH PERFORMANCE SUSTAINABLE ENERGY

With a height of 200 m and spanning 626 m across, the Kölnbrein Dam is the largest dam in Austria.

At peak, around 200 million m³ of water is impounded behind its double curved concrete dam.

That's enough to fill a bathtub for 1.4 billion people, some 20% of the world's total population.

Austria – Malta Oberstufe and its Galgenbichl power station is a pumped storage hydropower plant located about 1,933 m above sea level in the mountains of Carinthia, Austria.

Equipped with two vertical pump units, construction began in 1974 and was completed in 1977. First commissioned in 1979, Malta Oberstufe features a 200 m-high double curved concrete dam. It is not only the highest dam in Austria, but also one of the highest curved dams in Europe. At peak capacity the lake produced by the dam has a storage volume of about 200 million m³.

After nearly forty years of service, the plant is now being repowered with new high-performance variable-speed pump turbines. The existing turbines had a rated capacity of 62.8 MW each. In pump mode, the

units were rated at 21 MW at 375 rpm and 58 MW at 500 rpm. ANDRITZ Hydro will replace the existing units with turbines rated at 80 MW each in both pump and turbine operational modes.

Brand new forged and welded pump turbine runners and a newly welded stay ring are at the heart of this upgrade, which uses existing cast-in spirals. The new pump turbines have a volute in which a double rotor composed of a Francis impeller and a radial pump impeller rotates. The direction of rotation is the same for both turbine and pump operation, though hydraulically the turbine and pump parts are independent of each other. To accommodate the significant variation in head produced by the Kölnbrein Reservoir, the Isogyre pump turbine sets have pole-variable motor generators and two speed settings.

The fully compliant model test was completed successfully in May 2019 at ASTRÖ Graz, Austria. Today, with an annual average production of about 37,870 MWh, Malta Oberstufe is supplying electricity for more than 8,300 households and is reducing Austria's annual CO₂ emissions by around 28,000 tons.

TECHNICAL DETAILS

Malta Oberstufe:

Total output: 160 MW

Scope: 2 × 80 MW

Head: 50 – 220 m

Speed: 560 rpm

Runner diameter: 2,400 mm



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