

HOBAS® Penstock for the Princely Schwarzenberg Family Foundation Vaduz in Austria

Uniting Sustainability with Economic Viability

Little did Johann Adolf Count zu Schwarzenberg know that his iron ore findings in 1661 and iron production in today's Austrian municipality Turrach would mark the beginning of the region's increased need for energy supply. For a couple of centuries, the main source has been brown coal. Today however – in line with the plan of 34 municipalities to become energy self-sufficient by 2015 – the Schwarzenberg family foundation Vaduz has its sights on the environmentally sound energy source hydropower.

Already 5 years ago, the foundation had entrusted the planning agency Pittino ZT GmbH with a feasibility study to find out which water courses of its territory would be best qualified in regard to environmental sustainability. Two small hydropower plants, Leimingbach and Geissbach, with a joint standard capacity of 1.8 GWh have been erected since. With the experience gained as operator of these two first hydropower plants, the family foundation soon endeavored the erection of a further plant at the stream Turrachbach.

In aiming to unite sustainability (high quality and longevity) with economic viability, particular attention was paid to the choice and design of the approximately 2.5-km-long penstock. HOBAS Hydropower Pipe Systems presented the ideal solution: The highly corrosion and abrasion resistant products have a tested and proven service life of at least half a century while the smooth mirror-like inside surface provides optimal hydraulic properties at minimal head loss. HOBAS GRP Products scored furthermore regarding their practicability in installation: The comparably light pipes, which were delivered in 3 and 6 meter lengths for this project, are easy and quick to install – also in remote areas that are difficult to access. Thanks to the possibility to accommodate angular deflection in the



couplings and the proven and tested method of angular cut pipe ends, most changes of direction were achieved without the use of costly fittings. In other words, the line was optimally adapted to the route predetermined by the country road and narrow valley of the Turrachbach while saving on bends and keeping installation costs to a minimum.

Under the supervision of Pittino ZT, the contractor Felbermayr Bau commenced the construction of the plant with 71 m head in March 2012. The pipeline was laid right after the water inlet, crossing first the stream and then along the right bank up to the power house in open trench with an average cover of 1.5 m. While the upper half of the route was implemented with DN 1600 HOBAS Pipes designed for the pressure classes PN 4 and 5, the lower part was realized with HOBAS Pipes DN 1500, PN 6, 8 and 10. Rocks and ledges dominate the last 100 meters of the penstock so that a cast iron pipe DN 1200 was connected to the GRP line on the last 100 meters of the penstock.

After all necessary tests had been conducted, the cross-flow turbine with a standard capacity of 5.4 GWh went into operation in December 2012. It is currently the foundation's plant with the largest output. Pleased with the result, the director of the Schwarzenberg family foundation, Michael Sterneck, says: "Of course we want these projects to be economically successful. However, to us it is most important to have a solid and environmentally sound construction."

Fmd: hobas.austria@hobas.com



Year of construction
2012

Total length of pipe
2570 m

Product range
6 and 3-m-long pipes with and without angular cuts

3 bends

1 reduction

Diameter
DN 1600, DN 1500

Pressure class
PN 4 – PN 10

Stiffness class
SN 10000

Gross head
71 m

Flow rate
3000 l/sec

Rated output
1727 kW

Contractor
Felbermayr Bau GmbH

Designer
Pittino ZT GmbH

Client
Schwarzenberg Family Foundation Vaduz / Forestry Administration Murau