

Vaduz pumped hydro storage

Storage power plant Samina in Vaduz is the Principality of Liechtenstein's largest and most important power station. Built in the late 1940s, the facility at that time made Liechtenstein independent of outside energy sources.

Until the 1960s, it was even possible to export excess energy generated here. Although the power station has recently been providing only 12% of the country's required energy, it still plays an important role in sustaining the basic supply. However, time has taken its toll on power station Samina. A routine inspection in 2004 revealed several faults. Medium-term action was called for, prompting Samina's operators, Liechtensteinische Kraftwerke, to come up with a plan for the facility's future. After intense deliberations, it was decided that Samina should be restored and converted into a modern pumped-storage power plant.

Hydropower plant Samina near Liechtenstein's capital Vaduz was built shortly after World War II. Back then, the project was considered a huge economic effort. The decision to go ahead with this massive project was taken not only in the hope of creating jobs, but also with a vision for future generations. After all, the Samina storage power station promised Liechtenstein's energy independence from the Austrian town of Feldkirch. As it turned out, it was even possible to export some of the energy until the 1960.

HIGH-HEAD POWER PLANT WITH WEEKLY STORAGEBased on these considerations, hydropower plant Samina was finally designed as a high-head power plant with weekly storage. The intake and storage basins were built in the Samina Valley near Steg. The water passes through a channel and penstock system to the power house. Here three horizontal Pelton turbines are available for processing the motive water. Once fully commissioned, the facility provided a capacity of 9,600 kW with an annual output of 30.36 million kWh.

SAFETY RISK AND NEED FOR ACTIONDuring its many years of reliable operation, the Samina power station had been inspected regularly. In 2004, the inspection revealed serious flaws in the penstock. This implied an indirect need to act in order to defuse this immediate safety risk.

READY FOR THE FUTUREThe official commissioning of Samina took place on June 25, 2015 in the presence of representatives of the national, regional and municipal governments and other guests. After three and a half years of construction and a total investment of around CHF 50m, Liechtenstein's primary power plant was ready to be connected to the grid. With its new pumped-storage plant, Liechtenstein is well equipped for a future "smart grid" scheme, according to Liechtensteinische Kraftwerke. Thanks to the separate pump and turbine circuits, the facility can react faster and more flexibly to fluctuations than large-scale facilities of the same type.

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