



# SWITZERLAND

## THE WATER TOWER OF EUROPE

Switzerland is one of the most developed countries in the world, with the highest nominal wealth per adult and the eighth-highest GDP per capita globally. With a modern, prosperous market economy and a strong financial business and services sector, the country's manufacturing industry focuses on high-tech and knowledge-based production. As an economically stable country with efficient capital markets, Switzerland – the epitome of neutrality – ranks as one of the world's most competitive economies.

Today, there are about 643 hydropower plants of more than 300 kW capacity in operation with a total installed capacity of about 15,200 MW. Hydro produces an average of 36,600 GWh per annum, representing almost 60% of the nation's total generation capacity. Run-of-river power plants are producing 25.9% of the total hydro production, with storage power plants contributing 33.7% and approximately 4.3% coming from pumped storage hydropower plants.

Roughly, 63% of the country's hydroelectricity is generated in the mountain cantons of Uri, Grisons, Ticino and Valais, while Aargau and Bern also generate significant quantities. About 11% of Switzerland's hydropower generation comes from facilities situated on bodies of water located along Switzerland's borders.

The federal government has launched an Energy Strategy to 2050. Its main objective is to reduce nuclear power generation and to instead focus on the development of hydropower and other renewable energy sources such as wind and solar PV, as well as reducing consumption.

Under the terms of the strategy, Switzerland aims to increase electricity generation to reach 37,400 GWh by 2035 and 38,600 GWh by 2050 through a variety of measures. For instance, in order to exploit the technically feasible hydropower potential alongside the installation of green-field projects, existing power plants are to be rehabilitated and expanded – whilst taking the related environmental requirements and restrictions into account. Policy instruments to be used include cost-covering remuneration for

feed-in to the electricity grid for hydropower plants with a capacity of up to 10 MW.

There are about 1,000 MW of hydropower capacity under construction currently. Projects include examples like the new Nant de Drance pumped storage scheme. In total more than 25 projects were under construction in 2017.

### ANDRITZ HYDRO IN SWITZERLAND

Electro-mechanical equipment construction in Switzerland forms part of the very foundation of ANDRITZ with pioneers such as Escher, Wyss & Cie (1805), Bell Maschinenfabrik (1855), or Ateliers de Constructions Mécaniques de Vevey (1842) and Ateliers des Chamilles (1921).

Today, with its highly skilled employees and experienced hydro engineers, ANDRITZ in Switzerland serves the service and rehabilitation market and is the Pelton turbine competence center for the entire ANDRITZ Group. Its modern state-of-the-art manufacturing facility in Kriens is responsible for the domestic market. Meanwhile, the Vevey location, with a hydraulic lab and an advanced research and development department, works on export markets. The Jonschwil site is responsible for small hydro turbines.

ANDRITZ has been engaged in almost all Swiss hydropower projects to date with demonstrable success in all market sectors – from large new installations to small and mini hydro to extended service and rehabilitation projects.

### INNERTKIRCHEN/HANDECK, CANTON BERN

For the Innertkirchen/Handeck plant ANDRITZ supplied two complete generating sets (Pelton turbine and generator) for the enlargement of the underground powerhouses. Both contracts were awarded in April 2013 and the units were handed over to the client on schedule in July and September 2016, respectively. Since then, the units have proven their high reliability. The Final Acceptance Certificates were received 2018.

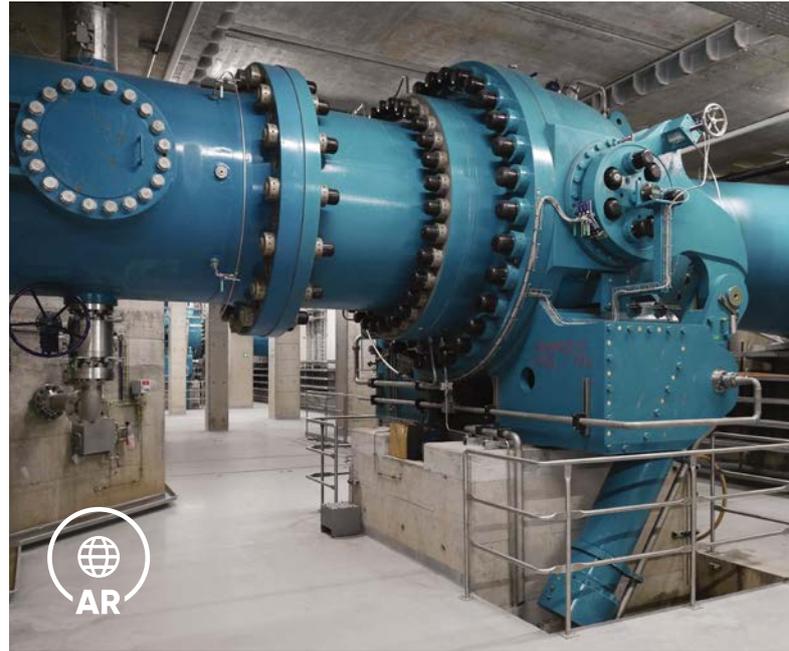
### HONGRIN-LÉMAN (FMHL+), CANTON VAUD

ANDRITZ received the contract for the supply of two generating sets for the extension of this important pumped storage scheme. Scope of supply consisted of vertical six-jet Pelton units, motor-generators, as well as spherical valves. The units were successfully handed over to the client in December 2016 and February 2017, respectively. Now in commercial operation, these plants represent a significant energy development in Switzerland.

### WETTINGEN, CANTON AARGAU

For this run-of-river project, ANDRITZ was awarded a contract for the complete modernization and upgrade of all three units. The scope of supply comprises the development of new runner blades, including a model test, and the full rehabilitation of the turbines and generators, which have been in service since 1938. In April 2018, the first unit was re-commissioned after an intensive half year servicing campaign. During this program, all major components were dismantled and rehabilitated in the Kriens service workshop. This project is an impressive example of the full-liner hydro service capabilities of ANDRITZ in Switzerland covering the entire shaft line of the machine.

Hagneck, Canton Bern



Hongrin-Léman extension, Veytaux

#### GENERAL FACTS

Population: **8,5 Mio.**  
 Access to electricity: **100%**  
 Installed hydro capacity: **15,295 MW**  
 Hydro capacity under construction: **964 MW**  
 Share of generation from hydropower: **59,6%**  
 Hydro generation per year: **36,666 GWh**  
 Technically feasible hydro generation potential: **41,000 GWh**

#### ANDRITZ HYDRO IN THE COUNTRY

Installed and/or rehabilitated capacity: **31,277 MW**  
 Installed and/or rehabilitated units: **2,435**  
 Locations: **Kriens, Vevey, Jonschwil**

TO KNOW

“About 60% of the national power generation is covered by hydropower, making it one of the most important domestic sources of energy in Switzerland.”

