SMALL HYDRO HIGHLIGHTS

# SUPPLYING MORE HOUSEHOLDS WI

## Tolga, Norway

Following successful commissioning, in May 2021 the Tolga hydropower plant in Norway was handed over to the customer. Located in the municipalities of Tolga, in the community of Innlandet some 360 km north of Oslo, this new run-of-river power plant is equipped with three identical 15 MW compact Francis turbines. Although there is no intake dam the power plant does have a threshold dam and utilizes a fall of 88 m in the Glomma River through the center of Tolga from Hummelvoll and down to the foot of Eidsfossen. In the threshold pond there are three fishing runs so that fish can migrate both up- and downstream at all water flows.

Back in 2018, ANDRITZ was awarded a contract to supply the complete electro- and hydro-mechanical equipment for this project as a "from water-to-wire" concept. The extensive contract comprised design, manufacturing, and delivery of electro-mechanical equipment, including turbines, main inlet valves, inlet pipes, hydraulic pressure units, electronic turbine governor, and generators including excitation systems. The contract further included the complete electrical system with automation and electrical power systems (EPS). Mechanical equipment installed in the waterways included trash racks, intake gates, draft tube gates as well as cooling and bilge systems, and a 70 t overhead crane. Installation, supervision, and commissioning rounded out the scope of the contract.

The power plant's owner, AS Opplandskraft DA, is itself owned by Hafslund Eco with a 75% stake and Akershus Energi with the remaining 25%. Tolga is operated by Hafslund Eco's personnel in Nord-Østerdal.

Despite the challenges due to COVID-19 and all related security and health measures, the project was completed in May 2021 and handed over to the customer five months earlier than originally scheduled.

### ENVIRONMENT AND SUSTAINABILITY – A FISH-FRIENDLY HYDROPOWER PLANT SOLUTION

The powerhouse of Tolga is a compact station built without the "four-floor" solution found at traditional power plants of this size. The facility has three identical

### TECHNICAL DETAILS

**Tolga:**

Scope: 3 × 15.41 MW / 3 × 20 MVA
Head: 88 m
Voltage: 13.2 kV
Speed: 428.6 rpm
Runner diameter: 1,500 mm
Av. annual energy production: 205 GWh

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compact Francis turbines installed. The units are defined as compact "standard turbines" by ANDRITZ. This results in significant savings in design hours and tonnes of steel needed. Rock extraction within the power station area was also reduced by approximately 25% when compared with a traditional solution.

**"This type of intake trash rack has never been built in Norway before. It prevents fish from swimming into the turbine at all."**

In order for a hydropower plant to qualify within the sustainability criteria of the EU taxonomy system, requirements are set that the natural migration routes for fish in the watercourse are maintained past the power plant. In traditional power plants, fish will swim into the intake and can be harmed in encounters with turbines.

The Tolga power plant is unique as the intake structure is built in such a way that the fish are completely prevented from swimming into the turbine. Its intake trash rack has openings of only 15 mm width and is at a low angle to the water flow. Such intake racks have never been built in Norway before but make it possible for the fish to be led safely past the intake to a bypass passage. This arrangement allows migrating fish to pass the structure completely unharmed.

With an estimated annual production of approximately 205 GWh, Tolga supplies enough power for over 10,000 households. ANDRITZ is proud to have been part of this environmentally friendly project.

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Powerhouse of Tolga. The new run-of-river power plant is equipped with three identical 15 MW compact Francis turbines.

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