

## The Norwegian hydropower system – A brief introduction

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Hydropower development in Norway has a long tradition, from the first plant built in 1885 up to the present system with an installed capacity of over 30 000 MW and an annual generation capacity of 130 TWh/yr. Norway is nr 6 in the world regarding hydropower generation, and largest in Europa, about the same as the two next, Sweden and France, combined. The technical potential is ca 214 TWh, about the same as Turkey. The lecture will cover some of the main technological steps in the development, with special focus on underground power plants, where Norway has pioneered the development and still have active research and development, for example by setting a new world record for unlined pressurized tunnels at the Tyin complex, with more than 1000 m head in an unlined shaft. The operation of hydropower plants using hydrological modeling and optimization tools will also be briefly described, and also the integration in the European power system.

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