Statkraft
PURE ENERGY

English

AURA

Welcome to

Aura power stations

Aura power station is located at Sunndalsøra in Møre og Romsdal county. With its steep mountains and big rivers the place is ideal for production of hydropower.

The Aura river, which previously flowed from Aursjøen, down through the valley of Eikesdalen and out into lake Eikedalsvatnet, has been dammed in Aursjøen. Using tunnels, water from eight rivers and streams is collected in what is known as a “gutter” and fed into Aursjøen, which as a result of the damming merges with lake Gautsjøen. Water from the Aursjø reservoir flows through a 5 km long tunnel across to the Osbu reservoir. From here, the water is used in Osbu power station before it ends up in Holbuvatnet.

Holbuvatnet is the forebay for Aura power station. From here, the water is fed through a 16 km long tunnel, with the cross-section of a railway tunnel, down to the distribution head. Here, the water is distributed between pipes that transport the water down to the seven turbines inside the power station. The pipes are laid free in 1100 metre-long shafts, which have a slope of 45 degrees.

The power station is located in a hall which has been blasted out of the rock 300 m inside the mountain and is split into two machine halls which are 16-17 metres wide, 18 metres high and 80 and 70 metres long respectively. After the water has been used for power generation, it flows out into Sunndalsfjorden.

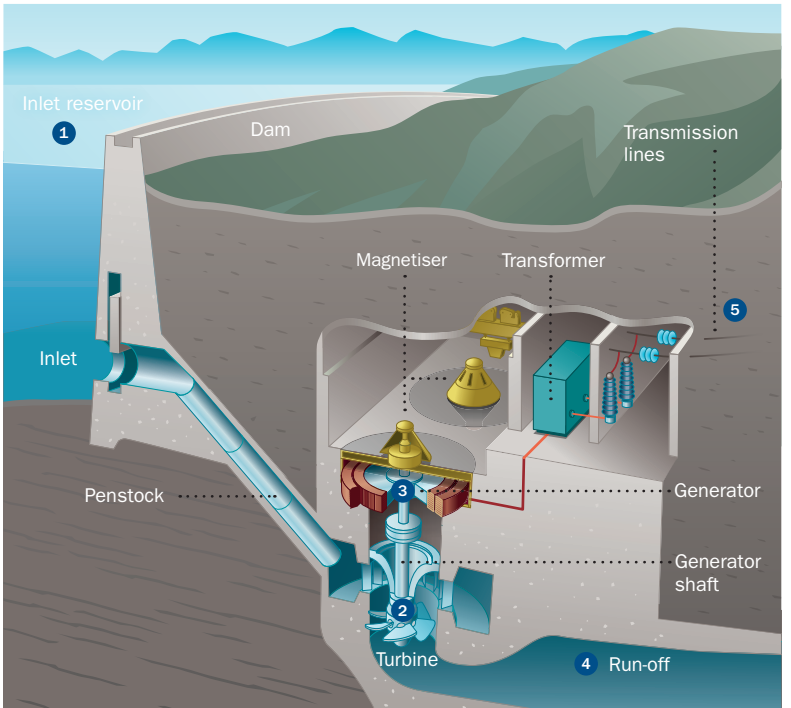
Power station	Number of generators	Output (MW)	Average production (GWh/year)	Statkraft's ownership (%)	Entered into operation
Aura	7	290	1706	100	1953
Osbu	1	20	85	100	1958
Sum Aura	8	310	1791		

AURA POWER STATIONS

- Aura is the largest power station in Møre og Romsdal county
- Built inside the mountains, two machine halls
- Seven turbines with a total capacity of 290 MW
- Annual production: 1.8 TWh
- Total length of main waterways to Aura power stations (tunnels): 16 km
- Total reservoir volume throughout the Aura regulation: 758 Mm^3 of water
- Net drop: 760 m

From water to electricity

Water from melting snow and rain collects in the reservoirs up in the mountains. From there, it runs down through tunnels and shafts to the power station's turbines. The water turns the turbine, rotating the generator fitted on the same shaft. In the generator, this mechanical energy is converted into energy – i.e. electrical current. The voltage in the generators, in the case of Aure power station, is 12,0 kV (kilovolt). In order to minimise transmission losses between the power station and the consumers, the voltage is transformed, up to 132 and 300 kV. The electricity is then carried over the national grid to wherever it is needed.



1. The kinetic energy from the water level is the raw material of the energy production.
2. In the power station, the water is routed into a turbine runner under high pressure.
3. A generator transforms the kinetic energy to electricity.
4. The water is lead through an outlet tunnel down to a reservoir or into the river.
5. Transmission lines transport the energy to where it is needed.

CREATING VALUE

Statkraft is Norway's largest land-based taxpayer. Our production activities generate significant wealth, which is returned to society through dividends, taxes and other public liens and charges. Statkraft also contributes actively to Norwegian society, providing financial support to sports and athletics, culture and other activities and good causes. Our social engagement is organised under the auspices of local clubs and associations and in close cooperation with the local authorities who host Statkraft's activities.

THE SOURCE

Hydroelectric power is clean and renewable – and is actually a form of solar energy. Water that evaporates due to solar energy returns in the form of precipitation. Rivers and waterfalls are used for the production of power, and large dams store the water for later use.

Thanks to hydroelectric power, we need not base our supply of electricity on fossil fuels or nuclear power, as many other countries do. Norway is like an island of clean and renewable hydroelectric power in Northern-Europe.

Norway is built, literally speaking, by hydroelectric power. Our economic growth and progress corresponded closely with the building of power stations. Electricity was the most important production factor in the industrialization of Norway, which freed our country from being a poor and underdeveloped place on the outskirts of Europe. The great change took place after 1850, and gathered speed after the dissolution of the union in 1905 when Norway once again became an independent nation. Electricity was an important part of the foundation for the enormous economic growth which occurred, and at the same time, in the course of a half century, it would completely transform Norwegian homes. The wood-fired stoves with cooking plates in the kitchen and oil lamps were thrown out for good and replaced with electric stoves, panel heaters, lamps, electrical appliances and computers.

Tunnel to Aura power station

Trouble shooting

Osbu power station

HISTORY

1913-1919

Development of Aura power station was started in 1913 by A/S Aura, which had acquired the fall rights. After a brief stoppage in work following the outbreak of the First World War in 1914, work was resumed with a reduced workforce until it was stopped completely in 1919.

1940-1947

During the Second World War, the Germans resumed construction, but had to give up in 1943. The government acquired the development rights in 1946.

The Norwegian Parliament approved the development of the power station in 1947. Shortly after, a new aluminium smelter was planned in Sunndalsøra.

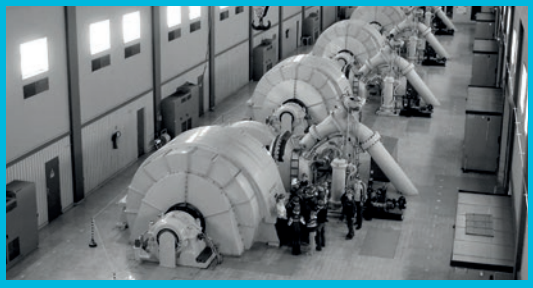
1953-1972

The first unit in Aura power station was put in operation in 1953, and four years later the seventh and last unit was put in operation.

Osbu power station began operation in 1958. That year the Parliament also approved what was known as the “gutter” project. Several streams were transferred to the power station. From 1972, the Osbu power station could be remotely controlled from the control room in Aura power station.

2001-2014

In the early 2000’s Statkraft initiated an extensive cleanup project in the area. The Osbu reservoir and the Aursjø reservoir were rehabilitated. From 2005 both Aura and Osbu underwent major rehabilitations.



One of the machine halls in Aura power station

Snow mobile with driver

Waterway to Aura power station

Hydropower and the environment

Hydropower is a renewable, clean, reliable and flexible energy source. It is a mature energy technology which will supply electricity for generations. Hydropower plays a strategic role in mitigating climate change. Expertise in developing hydropower stations has developed together with knowledge of the environmental impact.

Hydroelectric power stations with reservoirs work like rechargeable batteries, meaning that they store water as an energy resource. Hydropower has a key role to play in the family of renewable energy sources, since it can supply the power grid even when there is a lack of wind or sun. It contributes to energy security and energy flexibility, without emitting greenhouse gases. Statkraft devotes a lot of resources to specific nature and environment protection measures, and conducts high-level research focused on tomorrow's environmental and power supply requirements.

Building power stations can change water-flow patterns and water-courses, making it difficult for salmon and trout to spawn. To mitigate such impact, Statkraft is obligated by law to ensure that fish are replaced. Over the years, this has turned into a major commitment. Statkraft has therefore built several hatching facilities for restocking fish, and is also partner in a few joint hatcheries. Statkraft is constantly seeking to improve the natural environment for fish in the rivers and lakes and undertakes biotope improvement.

Osbu dam

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