



Statkraft
PURE ENERGY

ENGLISH

NORVEGE

Welcome to

Nore power stations



The Nore power stations, which are owned by Statkraft, are located in the county of Buskerud in the municipalities of Nore and Uvdal. A total of four power stations make up the Nore power stations: Pålbu, Nore 1, Rødberg and Nore 2. Power generation at the Nore power stations is controlled remotely from the operations centre in Dalen.

Hydropower is clean and renewable – a perpetual motion machine. The sun evaporates the water, which is then fed back into the system as precipitation which can be used to produce new energy. Hydroelectric power stations with a reservoir, such as the ones at Nore, can be regulated. This enables us to generate power when it is needed and when other renewable sources such as wind, sun and tidal energy cannot be used.

Nore 1 was a pioneer power station in terms of generating power for ordinary consumption. Large power stations had previously been constructed to supply industry, while Nore 1 was built to supply Oslo, Norway's capital.

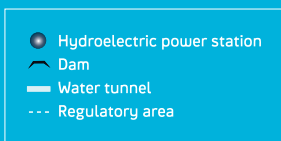
Transmitting electrical power over long distances was technically challenging, something which the 132,000 V (132 kV) transmission line provided a good example of.

The heavy components that had to be transported to Nore led to the construction of the Numedal Line (Numedalsbanen). This line was opened in 1927 and closed on 31 December 1988.

The first generator at Nore 1 was commissioned in 1928 and has been supplying Norway and Europe with clean, renewable energy ever since.



Operating region	Power station group	Power plant/pumping station	No. of generators	Output (MW)	Average production (GWh/year)	Statkraft's ownership (%)	Entered into operation
Nore	Nore	Nore 1	8	214	1 200	100	1928
		Nore 2	2	60	400	100	1946
		Pålsbu	1	6	22	100	2007
		Rødberg	1	3	16	100	2009
Total, Nore			12	283	1 638		



NORE 1 (1928) AND NORE 2 (1946)

- Surface station building
- Eight 27 MW generators (Nore 1) and two 30 MW generators (Nore 2)
- Average annual production: 1.6 TWh
- Total reservoir volume across entire Nore regulatory area 690 m³ water

PÅLSBU POWER STATION (2007)

- Surface station building
- One generator, 6.2 MW
- Average annual production: 21.8 GWh
- Utilises fall between Pålsbufjorden and Tunhovdfjorden

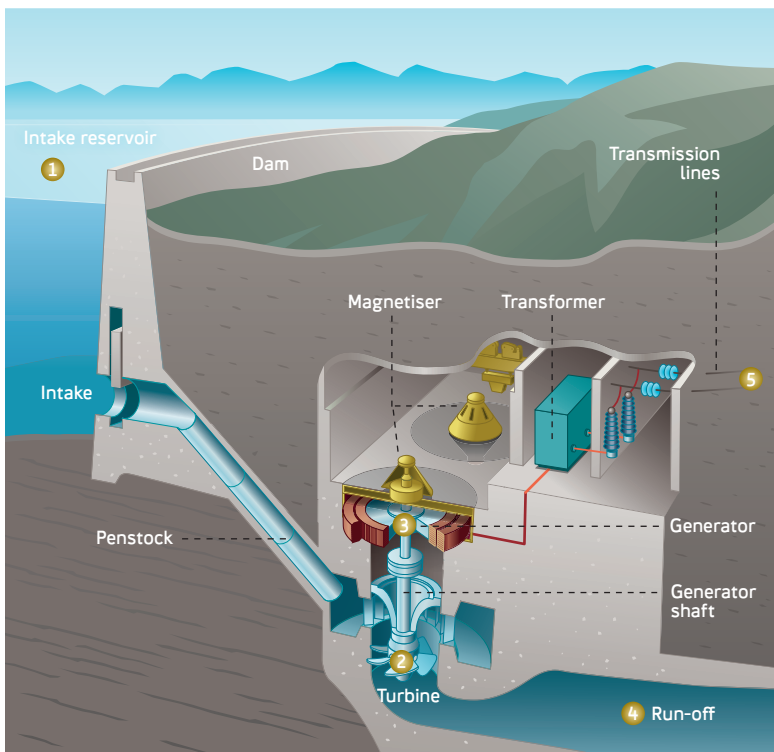
RØDBERG POWER STATION (2009)

- Surface station building
- One generator, 2.9 MW
- Average annual production: 15.5 GWh
- Primarily built to meet requirement for minimum flow from the Rødberg Dam into Norefjorden

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 Nore 1 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 420 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.

THE NORE POWER STATIONS

The Nore power stations utilise water from watercourses situated in the municipalities of Nore and Uvdal, Hol, Eidfjord and Ullensvang, and have a total catchment area of 2,200 km² with an average annual inflow of around 1,000 m³.

The regulatory area for Nore consists of the reservoirs of Halne, Pålсбу, Tunhovd and Rødbergdammen. Together,

these reservoirs can hold around 690 million m³ water. This is enough to generate 1.6 TWh of electrical power from Nore 1 and Nore 2. This meets the consumption needs of just over 40,000 households with electric heating.

A concession for the regulation of 'Norefallen' was granted as a state regulation for 80 years. This concession expired in

1994, and on 18 May 2001, the Numedal-Laugen Industrial Association was granted a new concession for the regulation of Numedalslågen. Statkraft is the biggest player in the association and owns all the power companies in Numedalslågen.

Through the new concession, the regulator was ordered to implement a number of major measures along the

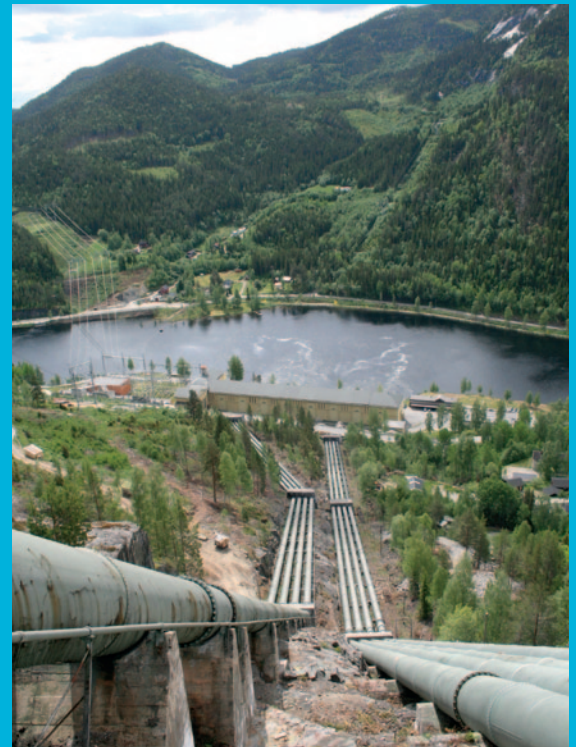
watercourses. Statkraft carries out inspections and operates the installations on behalf of the association.



The Pålсбу Dam with Pålсбу Power station.

Navy monument "Stein Kalle".

Hydroelectric power pipe rack for Nore I.



LOCAL HISTORY

1907-1917

1907: Norwegian Parliamentary resolution on the acquisition of rights to Norefallene.

1914: Concession for the regulation of Norefallene was granted.

1914 – 1920: Tunhovd Dam was constructed.

1917: The Norwegian Parliament decided to construct a power station at Rødberg with four generators.

1927-1939

1927: Tunnel spillway constructed in Pålbufjord to enable the fjord to be regulated.

1928: Four generators at Nore 1 commissioned during the year.

1933: Negotiations for the sale of Nore due to low energy prices. Nevertheless, the Storting decided not to sell.

1939: Generator number 5 commissioned at Nore 1.

1942-1946

1940-1946: Nore 2 Power station and the Rødberg Dam constructed.

1942-1943: Generators 6 and 7 commissioned (200MW).

1943: Pålbu Dam constructed.

1946: Two generators at Nore 2 commissioned (50MW).

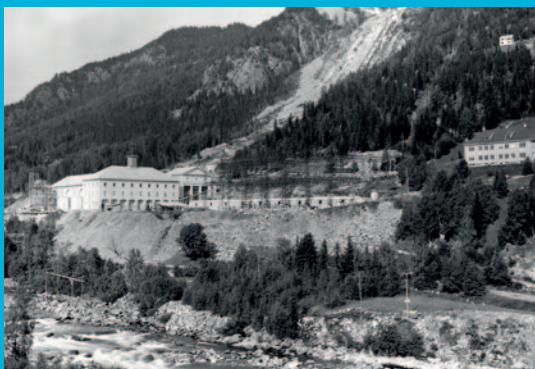
1956-2001

1956: Generator 8 completed.

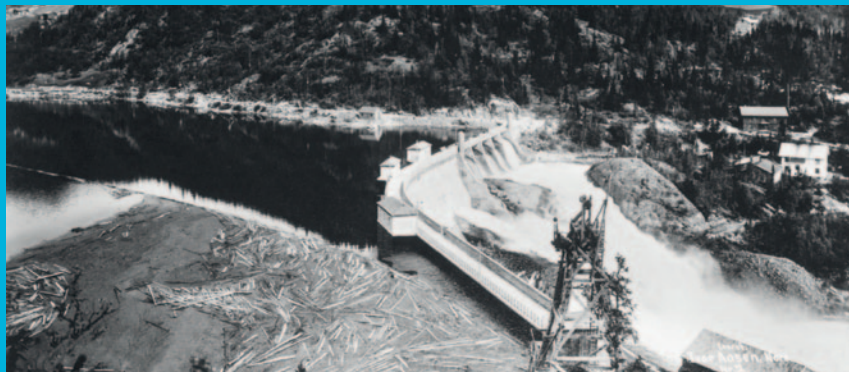
1969: Tunhovd Dam rebuilt as an embankment dam, and transfer tunnels to Smådøl and Økta/Borgeåi constructed.

1994: Pipe rack at Nore 1 decommissioned and an underground waterway constructed instead.

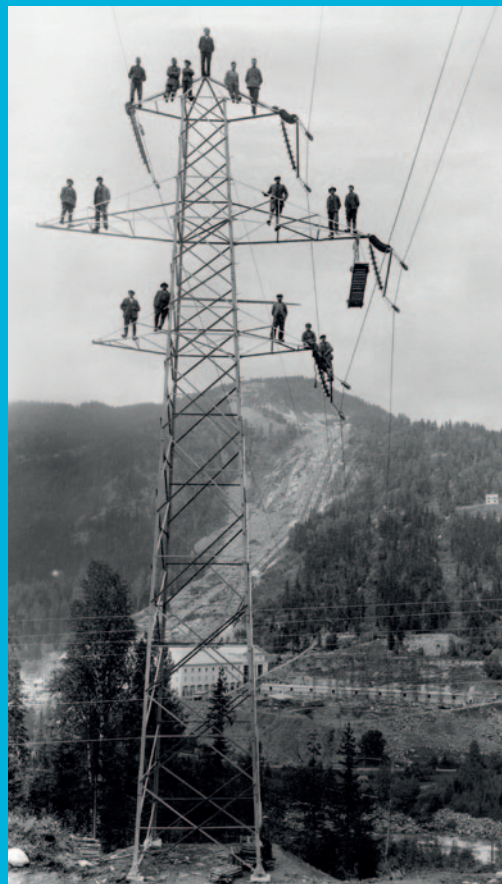
2001: New concession for the regulation of Numedalslågen (the Nore regulation) granted to the Numedal-Laugen Industrial Association.



From Nore I Power station, 1925.



Tunhovd Dam with timber floating in Nore.



The construction of Nore I in 1928 – workers at the top of a high-voltage mast without safety harnesses.

Hydropower and the environment



Hydropower is renewable, clean, reliable and flexible. This is a mature energy technology that has worked from generation to generation and plays a strategic role in climate change reduction and mitigation. Our expertise in building hydroelectric plant has evolved in step with our awareness of our environmental impacts.

Hydroelectric power stations with reservoirs work like rechargeable batteries that store the energy resource, that is, water. 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 plants can change water-flow patterns and watercourses, making it difficult for salmon and trout to reproduce. Statkraft is under an obligation to release fish in the watercourses to counteract such adverse effects. Over the years, this has turned into a major commitment. Statkraft has therefore built a number of fish hatcheries around Norway and is also involved in some joint ventures. Statkraft is constantly seeking to improve the natural environment for fish in the rivers and lakes and undertakes biotope improvement activities in many watercourses.





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