



E-CO Energi

E-CO Energi is one of Norway's leading energy groups. Its core business is the ownership and management of hydroelectric power stations. E-CO Energi is owned by the municipality of Oslo. The other operations are organised under the auspices of E-CO Vannkraft and Oslo Lysverker.

Oslo Lysverker

Oslo Lysverker AS owns Hammeren power station. Oslo Lysverker's main business operations involve the management of the Group's 25 per cent share in Opplandskraft DA.

		HAMMEREN
Catchment area	km ²	Approx. 153.5
Inflow mill.	m ³	116
Reservoir capacity	mill. m ³	78.3
Length of service tunnel	km	2.4
Head	m	108
Installed output	MW	5
Average production	GWh/year	16
Maximum absorption capacity	m ³ /sec	6.5
Generators	VAT	5.4
Transformers	kV	5.5/10.5
Construction start (year)		1898
Construction finish (year)	1989/2006	1900 (Rebuilt 1927)



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HAMMEREN

A cultural monument and a power station



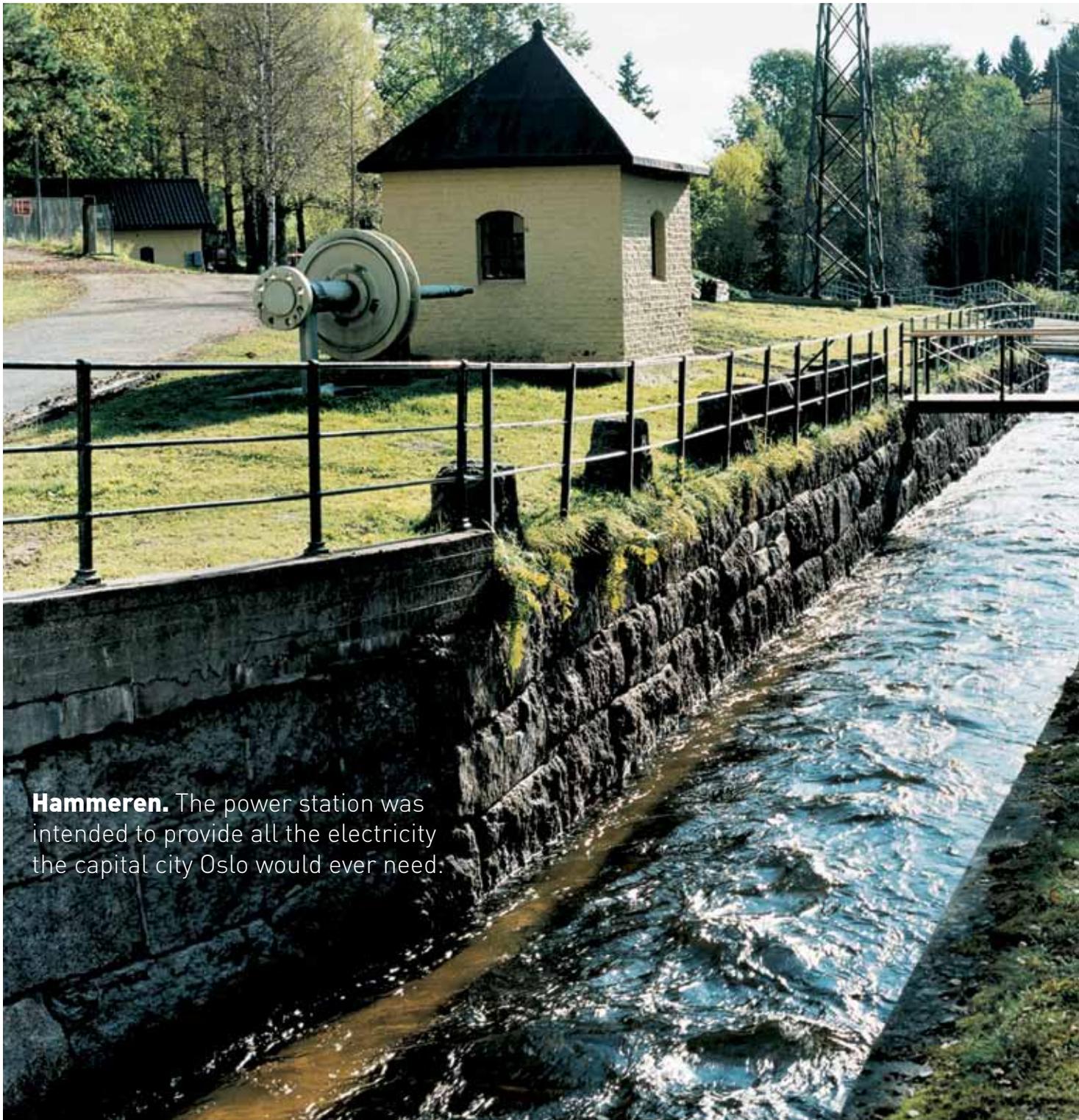
Old culture meets new

Norway's hydropower has been developed by people with a time perspective completely different from what we have today. These pioneers from Norway's past thought at least 50 years ahead. They thought in terms of what we might call 'the infinite future'. The power stations built by these people have generated electricity more or less continuously since start-up and some plants have been in operation for nearly 100 years.

All energy production leaves a footprint on the environment. For example, hydropower production encroaches on the environment during construction. Nowadays, construction work is carried out carefully to allow nature to recover rapidly once a facility has been completed.

Hydropower technology may be more future-oriented now than ever before. Hydroelectricity is clean green power - clean to make and clean to use. Not least, it is created in a clean natural environment. The future depends on green power. That is what makes hydropower eternal.





Hammeren. The power station was intended to provide all the electricity the capital city Oslo would ever need.

It all began here in Maridalen more than a hundred years ago: the first hydropower project to generate electricity for Oslo. Hammeren is still in operation today, although now it is as much a cultural monument as a production unit. The plant has a history of pioneering operations and bold engineering work. It is E-CO's oldest hydroelectric power station, an icon of the fantastic development that culminated in man harnessing nature's own clean energy.

The work began by damming up the mouth of Lake Skjærstjøen. The water from the catchment area in this part of Nordmarka, a green belt north of Oslo, runs into Lake Skjærstjøen.

The power station itself was located 2.5 km lower to take advantage of the fall between Lake Skjærstjøen and Lake Maridalsvannet. The water had to be channelled down into large pipes. It was quite a challenge even to make pipes that could withstand such tremendous pressure. The solution was thick ship-quality steel pipes purchased from Scotland and riveted together manually on site.

The project was a pioneer feat of engineering. None of those involved had previous experience. Workers experienced great difficulties with some of the equipment, and most of the work eventually had to be done using sheer brute strength.

In 1900, after a construction period of only two years, this daring project was completed and Hammeren power station was generating electricity. It was a great victory for the new technology. The city and not least the new-fangled means of transport – trams – got their much longed-for electricity.

In 1927, the station was modified, replacing the six generators with one large 5000 kW generator. Naturally, however, Hammeren was unable to provide all the electricity Oslo 'would ever need'. It currently supplies the normal requirements of just 800 households. That being said, it is an important and valuable cultural monument.

Energy production in a beautiful scenic area
Norwegians are known for having close ties to nature. The vast majority of us have a positive attitude to enjoy



walking and hiking. We want to safeguard nature and to make use of it for recreational purposes.

Paradoxically, the beautiful scenery is also an important production area. The raindrops that fall in the areas where we walk turn into the energy required to maintain our modern lifestyle. Although it is one of our major industries, the production of hydropower now leaves practically no footprint on the environment and creates no pollution at all. Our largest hydropower production sites are actually among Norway's most popular tourist areas.



Some 100 years ago, most construction was based on muscle power.