

# POWER TO THE PEOPLE

Norway is in many ways fortunate when it comes to generating electric power. The abundance of water and waterfalls makes it easy and fairly cheap to produce electricity.

## Hydroelectric Power



Power lines

Production of HEP (hydroelectric power) is also non-polluting as the generator will be driven by water and not steam from the burning of fossil fuels.

However, harnessing the waterfalls means conducting the water through huge pipelines, which is by many environmentalists seen as an invasion of the unspoilt nature.

To put a mighty waterfall into pipelines is clearly not adding to the beauty of nature, but the issue is clean, non-polluting power versus well-preserved natural scenery.

A power-plant does not create or produce energy. This is an important scientific principle, because we don't consume energy. The amount of energy is constant; a power plant will convert mechanical (or kinetic) energy into electric energy, in the same way as a battery converts chemical energy into electric energy when its terminals are connected. This principle is called conservation of energy.

## **Regulating the Water Supply**

Although it rains quite a lot in Norway, the amount of water in a waterfall will be unstable and decrease in dry periods. To secure and control the supply of water, huge dams are built to store water in reservoirs. This will stabilize the water supply and make it possible to regulate both the amount and pressure of the water. The effect of a hydroelectric power plant will depend on the height of the fall, the amount of water and the cross-section of the pipes. It is possible to regulate the effect by means of huge valves which will be operated to obtain the desired effect. This is done to ensure the correct amount of power both in peak periods when the demand and consumption are high, and to save power when the demand is low, for example at night time.

## **Generating Electricity**

From the reservoir the water is conducted through the pipelines and hits the turbine at high speed, which in turn will make the generator rotate. The generator will produce alternating current (a.c), and is also referred to as an alternator . The voltage will be stepped up by a transformer as the power leaves the power station. This is mainly done to reduce loss of power during distribution.

## **Distribution of Electric Power**

The distribution of electric power will either go via overhead transmission lines or in underground cable systems. This distribution system is called the grid and will supply the consumers with stable power. The voltage is stepped down in substations before it reaches the consumer.

The issue of power distribution causes debate in many communities. The overhead lines with the high pylons are seen by many as an eyesore in the landscape and the electromagnetic radiation from the high-voltage lines is also seen as highly dangerous. However, an overhead transmission system is both cheaper and easier to maintain than an underground cable system. This is a conflict of interest between the distribution companies and the environmentalists, who would prefer all power distribution to go underground.

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