STENSALT

Located at the edge of the city, in the old industrial zone and at the estuary of the sea stands the Stensalt.

It pumps water during the night and releases it during day-time when the electricity demand is at its peak.

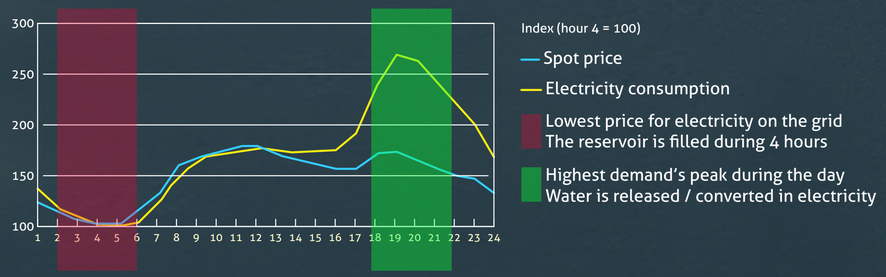
On its top, the salt is extracted from seawater. It flows then through pipes to run down along its surface to create layers of saline concretions.

The Stensalt consists of a cylindrical tank standing at 30 meters high with a diameter of 30 meters and a height of 50 meters (total height : 80 meters). It has a storage capacity of 40,000 m3 of water.

During the early hours of the day (02:00-06:00), electricity to pump the water is used either from the neighboring wind turbines in Refshaleøen or from the grid where the electricity price is low. In the evening time (18:00-22:00) the water is released to generate electricity and meet the peak energy needed in the Danish households.

The Stensalt is estimated to release a total daily energy of 5 MWh. This represents the extra energy needed during the evening peak power for 2200 households, that is to say 2% of the needs of the city of Copenhagen. The Stensalt annual energy production is expected to be 1800 MWh.

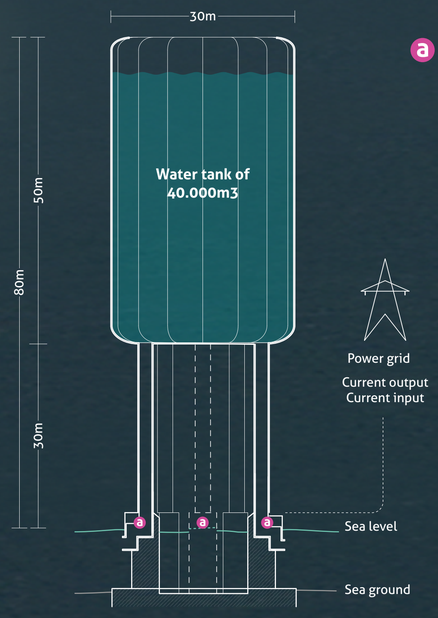
Average electricity consumption per household and electricity price in Denmark
Hours of water pumping and hours of electricity production



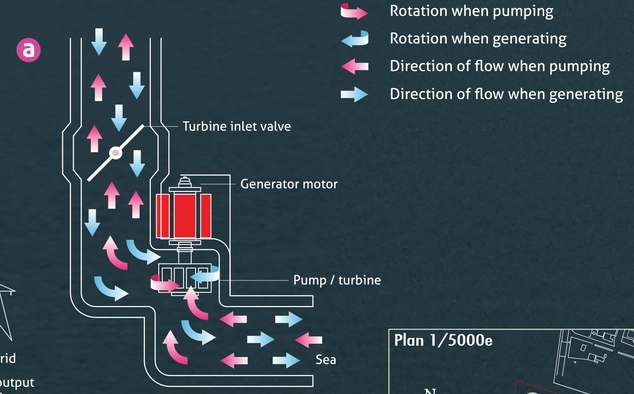
Index (hour 4 = 100)
Spot price
Electricity consumption
Lowest price for electricity on the grid
The reservoir is filled during 4 hours
Highest demand's peak during the day
Water is released / converted in electricity

Pumped storage

Watertank / scale 1/500e



Pump / Turbine: pumping / generating



Rotation when pumping
Rotation when generating
Direction of flow when pumping
Direction of flow when generating

At times of low electrical demand, excess generation capacity is used to pump water into a reservoir.

When there is higher demand water is released back through a turbine generating electricity.

Pumps has to be placed under sea level or have an adequate initial Piezometric.