The world's most eco-efficient computer hall from Helsingin Energia
District cooling production methods

- Winter
  - Conventional solution
  - New solution

- Autumn
  - Conventional solution
  - New solution

- Spring
  - Conventional solution
  - New solution

- Summer
  - Conventional solution
  - New solution

Methods:
- ABSORPTION
- HEAT PUMP
- FREE COOLING
Eco-efficiency for computer halls

Helsingin Energia’s new solution takes computer halls into an eco-efficient age: the computers are cooled by district cooling, and the heat produced by the machines can be piped into the district heating network to heat buildings in Helsinki and to provide them with hot water.

If all the computer halls in Finland operated on this principle, up to 500 MWh of energy could be saved every day. At the same time, a medium-sized town’s worth of buildings could be heated.

Beneath central Helsinki lies a ready-made district cooling and heating network and plenty of subterranean spaces for eco-efficient computer halls.

Compressor-operated cooling devices have used cooling agents, such as HCFC compounds which are classified as destructive of the ozone layer in the atmosphere.

No cooling agents are used in a district-cooled computer hall.

Compressor-operated cooling equipment increases power consumption considerably. The output of a conventional cooling system cannot be increased, but a second unit must be installed on the roof, if increased output is required.

With the Helsingin Energia cooling solution, output is never inadequate and can be raised steplessly at any time. Our production capacity already exceeds 100 MW and more is being built to respond to growing demand. One hundred percent of the capacity and electric energy of the electrical connection can be used for computing. None of the client’s electricity is used for cooling.

District cooling is produced by a total of 15 mutually independent production units in three separate plants. Two of the production plants are in Salmisaari, and the third is the Katri Vala Heating and Cooling Plant in Sörnäinen. The Katri Vala plant and one of the Salmisaari plants are situated in premises excavated underground.

In a conventional solution, power transmission lines and data communication links run along the street network, subjecting them to external risk factors, such as diggers etc.

Underground energy tunnels provide a secure route and an unbroken supply for important connections. Helsingin Energia has a tunnel network of almost 60 km in Helsinki.

Premises excavated into bedrock ensure the highest possible physical security.

District cooling production methods

The absorption technique is employed to produce district cooling using thermal energy that is otherwise wasted in energy generation. The absorption machinery operates in summertime, when sea water is too warm for free cooling.

A heat pump is used to recover thermal energy obtained from district cooling. The heat is transferred to the district heating network for heating buildings and domestic hot water in Helsinki.

Free cooling produces district cooling from cold sea water between November and May, when its temperature is below 8°C. The cooling is produced direct from sea water whenever possible.