



Swedish air-traffic hub obtains substantial energy saving

Arlanda Airport, Sweden

Energy savings reaching 19 GWh annually – this equals the annual energy volume used by 2,000 average-sized Swedish single family houses. With more than 18 million travellers passing its gates annually, Arlanda Airport (situated about 40 km north of the Swedish capital Stockholm) is an important hub for the Scandinavian air traffic. Arlanda is also the largest place of work in Sweden, employing some 15,000 people.

Its total roofed surface comprises 450,000 m² and its need of energy equals the need of a town with some 25,000 inhabitants. When Arlanda set out to optimize their energy efficiency, a major success factor was an underground storage of thermal water – a project where Alfa Laval was selected to provide the heat exchangers.

The world's largest aquifer

The Arlanda airport is situated on a giant boulder ridge called Brunkebergsåsen. 15-25 metres under the

surface of this ridge – embedded by insulating layers of gravel, sand and boulder – lies the largest aquifer (underground lake) thus far known. It holds approximately 600,000 m³ of water and serves (since 2009) as a giant reservoir for the heating/cooling system of Arlanda Airport. During the summer, hot water is pumped into the aquifer for storage and use during the winter – while cold water stored during the winter months is used for cooling during the summer.

Three giant heat exchangers

The heat exchangers serving the Arlanda system – one T20 and two TL35 – are giants (9 tonnes each) delivered by Alfa Laval. For the installer Malmberg Water AB this was a natural choice. Magnus Borneke, Business Area manager at Malmberg Water AB explains:

“It was a matter of trust. We had worked with Alfa Laval previously and they had quite a number of installations at the airport already”.

Considerable energy savings

The Arlanda UTES system is somewhat of a “model project” – a fact implying considerable energy savings. Chillers and heat pumps are eliminated, as are fossil fuels. Since the operation of the system started in 2009, the annual total energy saving meets the calculated level of 19 GWh. This equals the annual energy volume used by 2,000 average-sized Swedish single-family houses. From an environmental perspective, this is an important gain. In addition to this, CO₂ emissions of close to 7,000 tonnes annually have been eliminated.

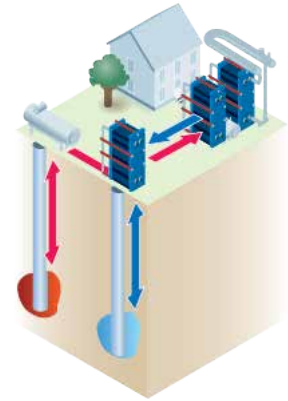
Kenth Arvidsson is the CEO of Arlanda Energi (a department within the Swedish airport national operator Swedavia) and the person heading the constant pursuit of rational energy utilization at Arlanda. In 2009, his

organization was selected for Stora Miljöpriset – a major Swedish award for successful measures to reduce the environmental impact of an operation.

“The aquifer is a major success factor and the heat exchangers have fulfilled their respective tasks very well. We feel safe working with Alfa Laval, since their experience is profound and they save no effort to offer the best.”

The UTES principle

The principle behind the UTES (Underground Thermal Energy Storage) technology is fairly simple. Regardless of how hot or cold water is being produced, an aquifer (a natural underground water reservoir) stores the water for later use. Hot water produced during the summer can be stored for use during the winter months (or adverse with cold water used for cooling during the summer). In such applications, aquifers serve as giant thermo bottles. The thermal loss is noticeably low.



Fast facts – Arlanda airport

Scene – Arlanda Airport, Sweden – major Scandinavian air-traffic hub

Installer – Malmberg Water AB (Sweden)

End-user – Arlanda Energi AB – a department within Swedavia (see above)

Task – Heat transfer from the world’s largest aquifer (underground water reservoir)

Challenge – High thermal efficiency

Result – Considerable energy savings and substantial environmental gain:

- Energy savings reaching 19 GWh annually – this equals the annual energy volume used by 2,000 average-sized Swedish single family houses
- Annual CO₂ reduction of 7,000 tonnes

Product facts

- One T20 with 636 plates (stainless steel 316) serving the distribution circuit within the airport.
- Two TL35 with 316 plates each (stainless steel 316) serving adjacent to the aquifer. AHRI performance certification on plate heat exchangers



Energy savings
19 GWh



Emissions savings
7,000 tonnes



Heating of homes
2,000

How to contact Alfa Laval

Up-to-date Alfa Laval contact details for all countries are always available on our website at www.alfalaval.com

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