

**In recent years, the need to save on the planet's resources has become more and more of a concern for the public at large. The development of society is driven by increasing energy demand, while fossil fuels and nuclear power are met with resistance, resulting in a need to conserve energy and reduce energy costs.**

Data centers are a large and growing energy consumer, accounting for 3% of the world's total energy consumption in 2017, and could by some accounts reach 20% by 2025. Sweden offers data centers unique conditions through political initiatives that provide major consumers among the lowest electricity prices in the world. This combined with a stable political situation and favorable ambient conditions has led to that some of the world's largest players in the field have established data centers in Sweden.

ENACO Sverige AB, building data centers since its inception 40 years ago, has in recent years had an increasing demand for energy optimization services.

In this paper we present a customer in western Sweden who, a year ago, demanded measures to reduce its data centers' energy consumption and climate footprint.

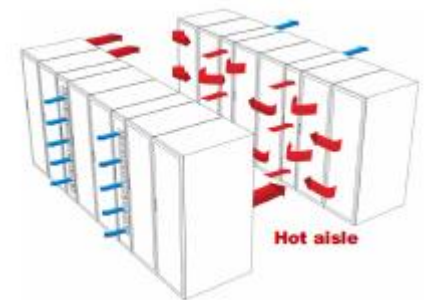
ENACO launched a comprehensive analysis of one of its data halls and suggested several measures to reduce energy demand that the customer then instructed ENACO to implement.

The work began with rebuilding of the chillers' control function, which reduced the flow rate of the refrigerant with 50% and at the same time yielding significantly higher efficiency and lower energy consumption. The measures also resulted in the chillers getting a higher return temperature which further contributed to energy savings. By adjusting room temperature and humidity, the number of operating hours and maintenance costs could be reduced. With these modifications, free cooling could be obtained during more hours which contributed to further savings.



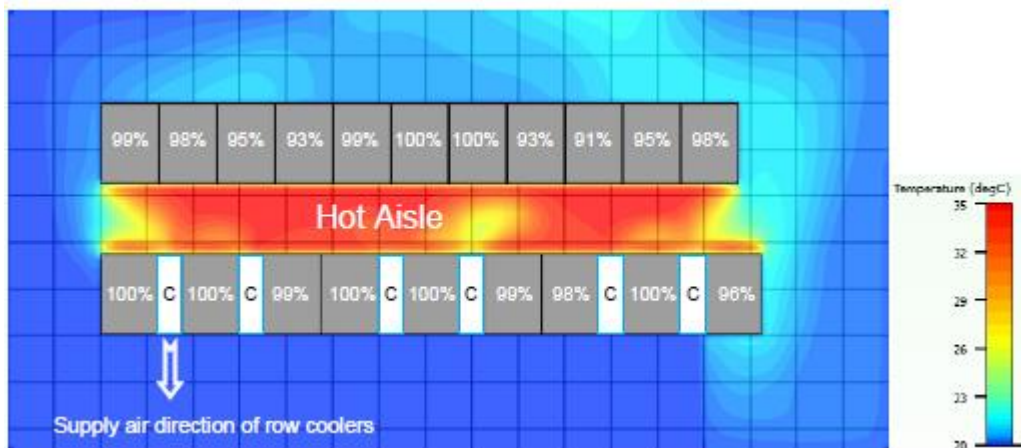
ENACO continued to complement the system's refrigeration pumps with frequency control and replacing valves in fan air coolers. After these rebuilds, several cooling coils could be switched off and instead be stand-by as N+1 backup.

The cabinets in the data hall were encapsulated in a hot aisle containment and ENACO optimized the solution by introducing cover plates to improve airflow and prevent mixing of warm and cold air. Parts of the plant temperature sensors were checked and calibrated and the combined measures resulted in 10% lower energy consumption.



ENACO also analyzed and optimized the placement of the perforated plates in the hall's data floor based on the cooling requirement. Overall, the customer could save 300 000 kWh/year, or about 7%, through these measures.

Finally, focus was placed on the plant's UPS:es which were coming of age. With a rated power of approximately 150 kW and a 66% efficiency, ENACO recommended an investment in new, more efficient UPS:es. With the suggested investment which was implemented by the customer, the energy loss could be reduced to about 10% of the previous loss, which resulted in annual savings of about 900 000 kWh. ENACO demonstrated that the investment of approximately MSEK 3 for new UPS:es could be repaid in three years, at the same time as the reliability would increase.



After completion of the project, the customer enjoyed a total energy saving of 1.2 MWh/year, or about 27%, reduced cost of recurring maintenance and a significantly increased reliability.

For more information, contact [info@enaco.se](mailto:info@enaco.se).