Saving 50 million Swiss francs on energy costs in 20 years with free cooling

The Swisscom data centre in Bern-Wankdorf is one of the most efficient in Europe thanks to its use of innovative energy technology, using 90 percent less energy for cooling compared with conventionally equipped data centres. Some 84 percent of the energy is thus used for the IT infrastructure and only around four percent for cooling purposes as well as another four percent for ventilation. Swisscom relies on *hybrid coolers* from JAEGGI in all construction sections in its modular data centre.

The company has invested 60 million Swiss francs in the new building. While the innovative energy technology was some 4 million francs more expensive than a conventional concept, it is expected to deliver savings of 50 million francs on energy costs in 20 years.

The company was honoured for its endeavours in 2015 by the Swiss Federal Office for Energy (BFE) with the Watt d'Or in the category of renewable energies. The authority awards this non-monetary prize every year in recognition of especially innovative and energy-efficient projects. In addition to the Swiss Watt d'Or, Swisscom was also honoured in the USA by the Uptime Institute in 2015 with the Brill Awards for Efficient IT. This international prize recognises sustainable and especially cost and resource-saving IT solutions.

Overview

Business area:	IT-Cooling
Application:	Data Centre Cooling
Country/City:	Switzerland/Bern
Fluid:	34 % glykol
Product:	JAEGGI *HTK* 1,8/7,8-2S-P6-CU-SLNF

JAEGGI Hybridtechnologie AG
Hirschgässlein 11
CH-4051 Basel

The JAEGGI *hybrid cooler* type *HTK* combines the function of an air-cooled dry cooler with a closed evaporative system. Depending on the required cooling capacity, free cooling is only supported additionally through evaporation of water from around 21 °C.

In terms of project implementation, Swisscom exceeded the recommended guidelines of the "American Society of Heating, Refrigerating and Air Conditioning Engineers“ (ASHRAE). The current ASHRAE 2011 recommendation (category A1) for maximum supply air temperatures in data centres is 27 °C.

The IT infrastructure in the Swisscom data centre in Wankdorf was designed such that the maximum permitted temperature could be increased to 28 °C with temperatures of up to 32 °C also tolerated for a few hours.

PUE value of 1.22

The Swisscom data centre in Bern-Wankdorf in Switzerland has an efficiency value "Power-Usage-Effectiveness" (PUE) of 1.22 and is therefore significantly more efficient than the average European value of 1.9. This was made possible despite or even because of renouncing conventional refrigeration engineering/electromechanical refrigerating machines.

Each individual element was selected according to the requirement for sustainability and operating cost efficiency. In other words, not the price determined the investment in each case but the long-term savings potential.

The waste heat from the data centre is fed into Bern's district heating grid and supplies households with heat energy and hot water. Wyler's open-air swimming pool will also enjoy a pleasant temperature in the summer months thanks to the waste heat.

Swisscom relies consistently on free cooling with eight JAEGGI *hybrid coolers* type *HTK* in order to keep the energy consumption as low as possible for the additional cooling required.

Evaporative cooling from 21 °C

The JAEGGI *hybrid cooler* type *HTK* combines the function of an air-cooled dry cooler with a closed evaporative system. Depending on the required cooling capacity, free cooling is only supported additionally through evaporation of water from around 21 °C. Evaporated water draws energy from the environment and uses it to cool the medium flowing through the coolers.

Until wetting is activated, continuous operation of the fans is sufficient for energy dissipation. Wetting is activated automatically by the unit's own *HYBRIMATIC* controller depending on the required cooling capacity. The integrated control and regulation system establishes the energy-related minimum between fan output and required cooling capacity.

Rainwater stored in a container with a capacity of approx. 2,000 m³ is used as wetting water.

Main data:	
Cooler type	*HTK* 1,8/7,8-2S-P6-CU-SLNF
Number	8 units
Heat dissipation of overall system	6,000 kW
Cooling on water side:	
Coolant	34 % glykol
Design fluid temperatures	35 °C/25 °C

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Air side:		
Operating state of the coolers	*Hybrid mode*	*Dry operation*
Air condition at inlet	32 °C/38 %	14.9 °C
Corresponds to a wet bulb temperature (inlet)	20.9 °C	
Total wetting water consumption		
Volume of evaporated water	13.8 m³/h for 8 coolers	
Control	*HYBRIMATIC R*	

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