

Solar power cools office building

This week's unveiling of Energi Fyn's newly constructed office premises is also the premiere for one of the world's first ventilation systems that uses solar power to cool and ventilate an office building.

CONSTRUCTION

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By using solar heated water, the energy consumption for cooling and ventilating Energi Fyn's new head office can be reduced by 60 percent compared to the energy consumption for conventional ventilation systems. At the same time, the power to run the system will be supplied by solar cells.

"We wish to demonstrate how natural it is to use solar panels to provide energy for the ventilation of a large office building. On hot summer days, when the need for ventilation is at its greatest, solar panels can deliver plenty of hot water for the cooling process," says Henrik Vorgaard, CEO of Energi Fyn.

The cooling process uses the heated water to dehumidify the incoming air and again during the evaporation process, which is used to bring the air to the correct temperature before it is sent back inside the building.

Major strain on the environment Traditional ventilation systems for industrial sites and office buildings have always been relatively harmful to the environment. This is partly due to the large amounts of cooling agent, usually 200 litres or more, which was stored in the installation's tanks and which

could leak out into the atmosphere, and partly due to the high level of energy consumption required to run the installation's compressors and cooling surfaces.

With the cooling and ventilation system that was brought into service this week in the newly constructed premises, cooling is performed by the solar panel system as soon as it produces water with a temperature of 55°C or above.

"In practice, this means that the cooling installation will be able to run on solar power all year round, since our tests over the past weeks have shown that even on overcast and relatively cool days, the solar panels still supply water with a temperature of more than 60°C," says Project Manager Robert Blach from the company Munters, which supplied the cooling installation.

However, the installation can also draw on energy from the local district heating network if required. The installation's cooling effect is about 240 kW and can process an air volume of 46,000 m³/h. During the winter, the installation has a heat recycling rate of 90 percent.

The installation contains neither compressors, cooling surfaces nor condensers with ventilators.

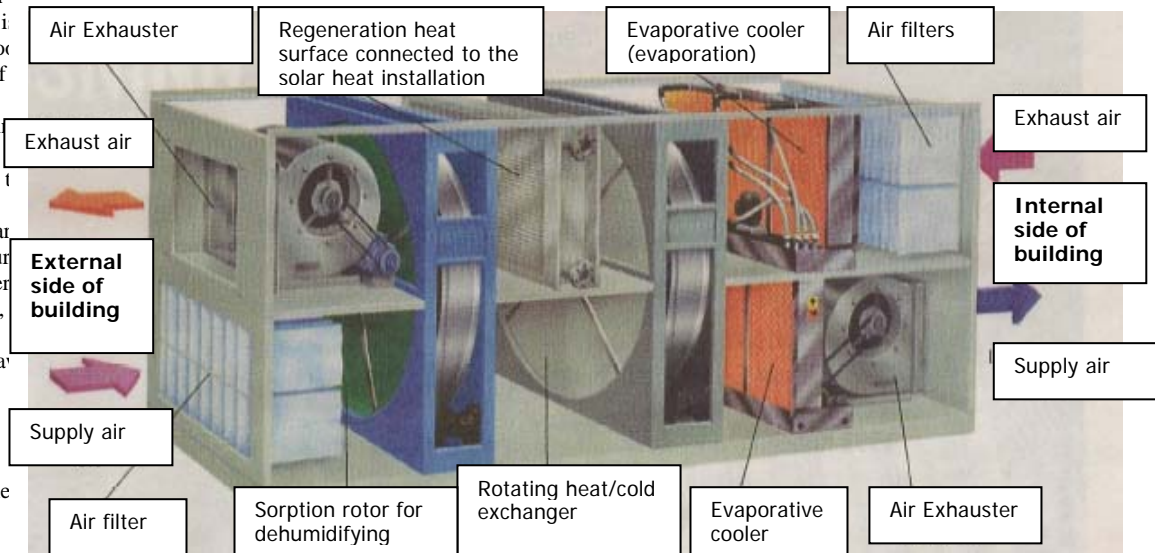
Supplementary technologies

The solar panel installation covers 37.5 m² and delivers a yield of 520 kWh/m² per annum. These panels are the only solar panels in the world that are able to provide a temperature which can reach 110°C and still

maintain a high rate of efficiency. The solar panels are supplied by the company Arcon.

HOW THE HEAT IS USED TO COOL THE AIR

The DesiCool installation uses an evaporative cooling installation to produce cool air. First, hot water from a solar panel installation is used to remove moisture from the incoming air. Later in the process, the water can be added again in an evaporative cooler. The temperature in 1 m³ air decreases by 2.5°C/gram of water added to the air through the evaporation process.



and the solar power installation and the solar panels will be complemented by intelligent light systems that will adjust the light intensity relative to the light entering from the windows.