91%
Reused energy

Sønderborg Hospital

New heat pumps make Sønderborg Hospital 91% self-sufficient – and a local energy contributor

PROJECT ZERO
SONDERBORG

The future of green healthcare

Sønderborg Hospital is leading the way for a more sustainable healthcare by replacing outdated gas boilers with energy-efficient heat pumps.

This innovative system not only provides heating and cooling for the hospital but also utilizes excess heat – covering 91% of the hospital's heating demand – and even contributes to the local district heating network.

What's more, the heat pumps enable comfort cooling at the hospital, making the indoor climate much more pleasant for both patients and staff.

By optimizing its energy flows, the hospital is significantly reducing its carbon footprint, offering a model that could inspire hospitals worldwide.

About Sønderborg Hospital

Officially opened as a state hospital on April 4, 1921

Part of Sygehus Sønderjylland

Located in central Sønderborg, close to the university and harbor

Watch the case video

Why heat pumps and hospitals are the perfect match

Ever noticed how the back of your refrigerator feels warm? Whenever cooling something, the extracted heat is released somewhere else – known as excess heat.

The new hydronic system at Sønderborg Hospital, featuring two heat pumps – each equipped with four compressors – works in a similar way: when cooling, it generates heat, and when heating, it produces cooling.

This mechanism offers great potential in buildings that need both heating and cooling – like hospitals. Hospitals require heating for patient rooms, offices, and water systems, and cooling for medical scanners, technical equipment, and operating rooms. By capturing and reusing both excess heat and cooling, the hospital maximizes its energy efficiency across all processes.

Sønderborg Hospital replaced its gas- and oil-based heating system in 2024 with two modern heat pumps, which have enabled the use of excess heat, reduced the need to purchase energy from the grid, and significantly lowered CO_2 emissions. Additionally, the hospital now contributes to the local heating network and supports Europe's objective of reducing reliance on fossil fuels.

91% reused energy

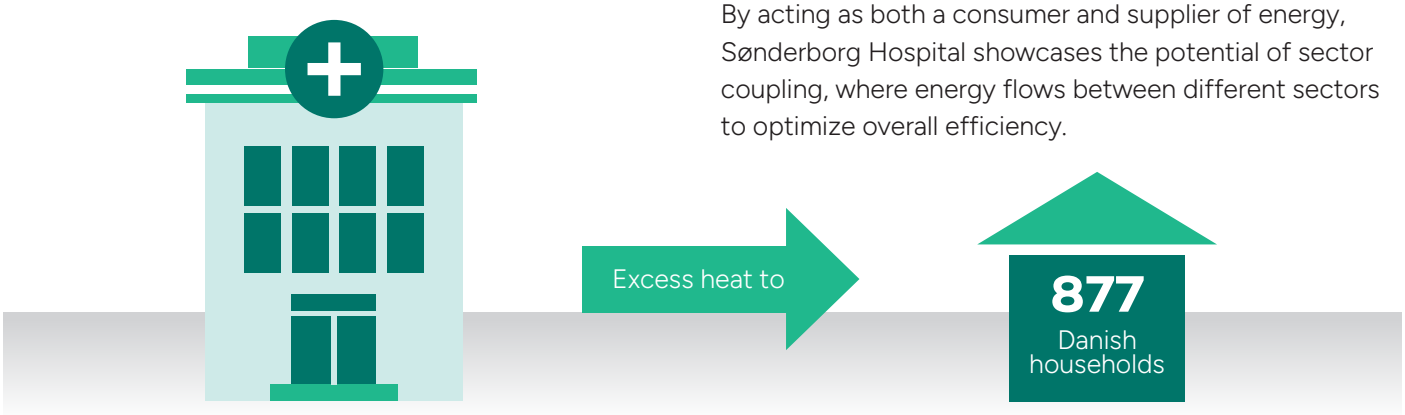
Excess heat covers 91% of Sønderborg Hospital's total heat demand

Turning waste into community benefit

One of the project's most notable aspects is its ability to capture and reuse excess heat. As the heat pumps cool critical hospital infrastructure, the extracted heat is redirected to heat the hospital's own facilities. An impressive 91% of the hospital's total heat demand is now met by excess heat, with only minimal district heating needed during the coldest months.

Any excess heat that the hospital does not use itself is transferred to the local district heating network, where it helps heat private homes in Sønderborg. The system is expected to supply 15,800 MWh of excess heat to the heating network each year – enough to cover the heating needs of approximately 877 Danish households.

By acting as both a consumer and supplier of energy, Sønderborg Hospital showcases the potential of sector coupling, where energy flows between different sectors to optimize overall efficiency.



A green blueprint for hospitals worldwide

By utilizing excess heat internally – that used to be wasted into the air – and supplying excess heat to the local district heating network, Sønderborg Hospital now helps reduce the overall heat production in the Sønderborg area by 28,300 MWh every year.

In other words, this project is more than just an upgrade at the hospital – it's a blueprint for how large institutions can actively contribute to a greener, more sustainable future.

Beyond its environmental impact, the new system also improves the indoor climate for both patients and staff. The heat pumps enhance air quality and temperature regulation, ensuring greater comfort in patient rooms, waiting areas, and workspaces.

By electrifying its heating system, reducing emissions, and supporting the local energy network, Sønderborg Hospital is setting a powerful example

of how healthcare facilities can lead the way in decarbonization. The modern hydronic system is not only effective – it's scalable, making it a viable solution for hospitals and large institutions around the world.

About ProjectZero

ProjectZero is a public-private partnership between Sønderborg Municipality and the Bitten & Mads Clausen's Foundation dedicated to making Sønderborg's energy system carbon-neutral by 2029. We also aim to inspire other cities to take on their green transition for a stronger positive impact on our climate.

In Sønderborg, citizens, organizations, businesses, utility companies and the municipality work strategically together in a public-private partnership to find local solutions to the global climate challenge.

Since 2007, energy-related carbon emissions have been reduced by 79% and the municipality is on track to deliver on their 2029 target of a carbon neutral energy system.

ProjectZero is anchored in the ProjectZero office, where a small team of employees coordinates and monitors the journey towards zero and brings together the right people, ideas and projects.

Our recipe for a green transition not only has the potential to solve the climate challenge in Sønderborg. It can be used all over the world. We want to show other cities the way and inspire them to create their own transformation. Every year, we welcome decision makers and journalists from all over the world, who want to know more about our road to carbon neutrality.

Do you want to know more or plan for a visit?
Visit our website or contact us at
visit@projectzero.dk.

PROJECT ZERO
SONDERBORG

Nørre Havnegade 43
DK-6400 Sønderborg
Phone: +45 31 68 30 90
Email: info@projectzero.dk