ENERGY SAVE

# Case: Schrader Gartneri

Case: System Installation - Greenhouse

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# Schrader Gartneri

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## Solution

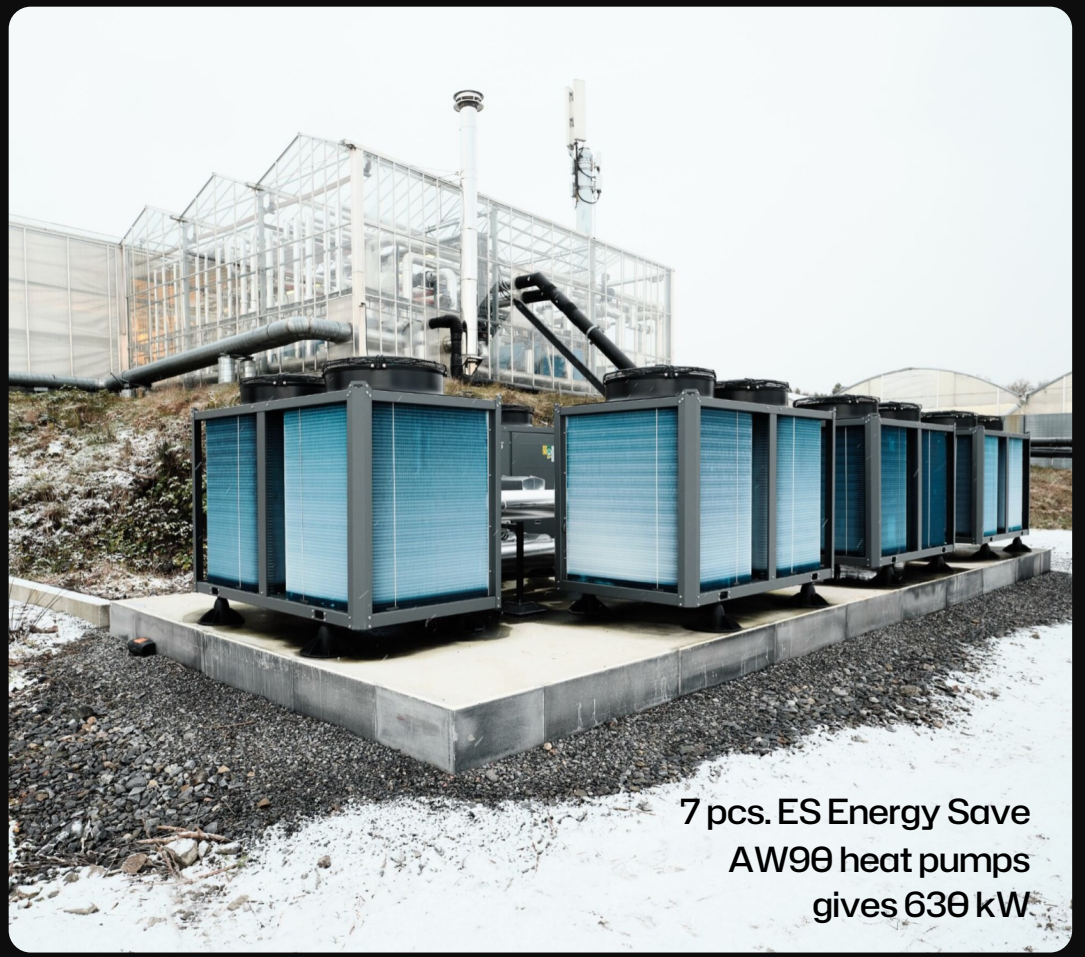
Customer: Schrader Gartneri, Norway

Installation date: 2024-09-24

Previous energy solution: Electricity

Installed system:

- Installation 1: 7 pcs. AW90 heat pumps, inclusive circulation pump.
- Installation 2: 3 pcs. AW90 heat pumps, inclusive circulation pump.
- Steering system NordFlex. Control and monitoring of heating systems based on heat punp technology including additive back-up.
- Electric cabinets with breakers and needed parts.
- Heated concrete slab, steered by outside temperature. Heating from heat pump water and electricity (as back-up).



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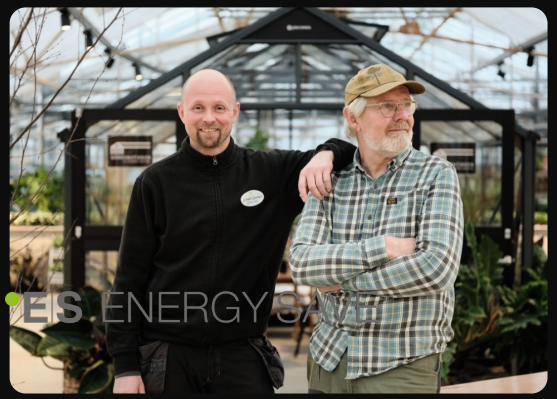
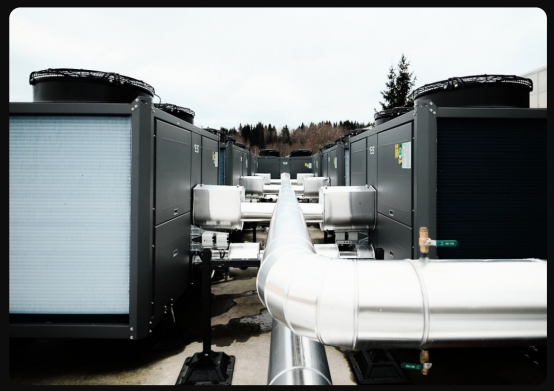
The ability to utilize energy from the outdoor air and become even more sustainable was essential when Schrader Gartneri invested in an air-to-water heat pump system.





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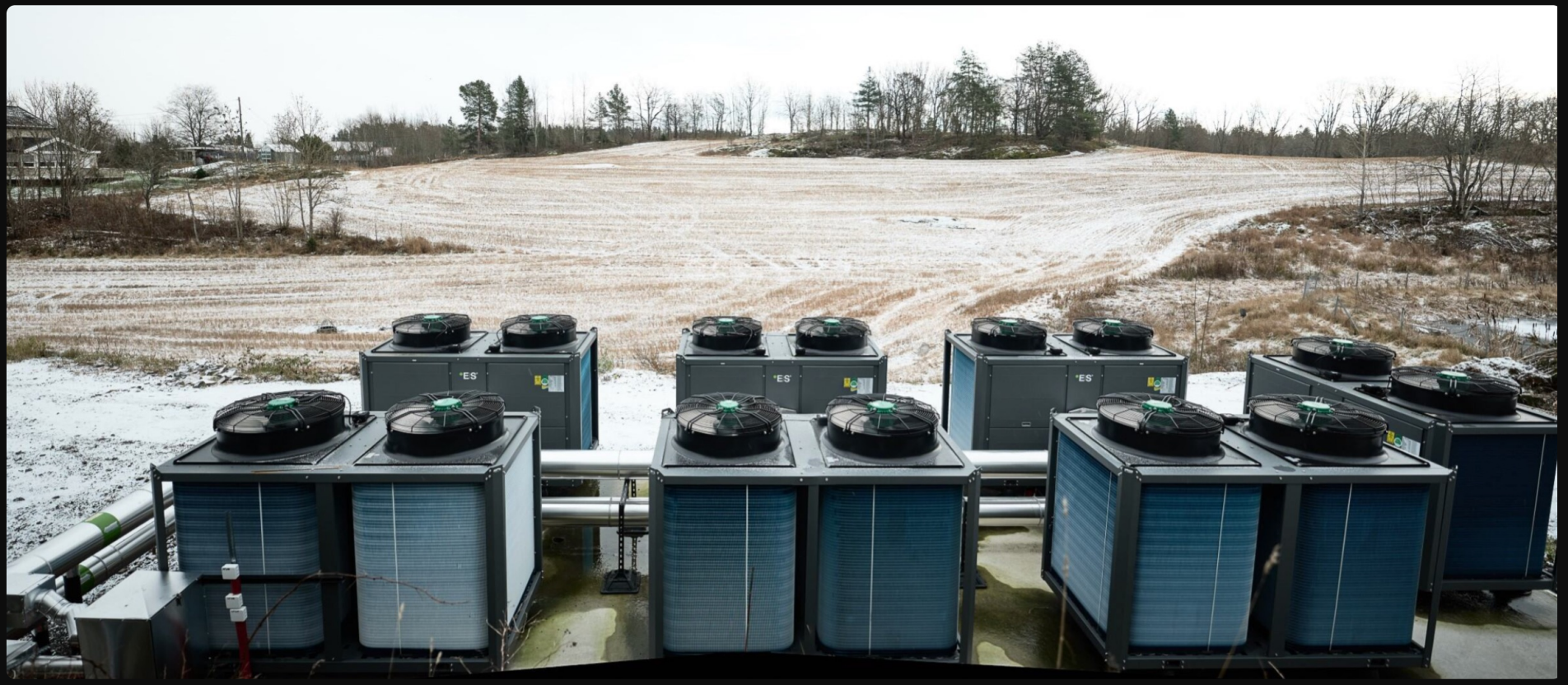

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## Investing in Heat Pumps – Reasons, Challenges, and Future Potential

**Schrader Gartneri in Norway has chosen to invest in heat pumps for greenhouse heating. The decision was based on a careful evaluation of alternatives and practical considerations.**
**Below is a summary of their key insights:**

### Reasons for Choosing Heat Pumps

- Alternative heating sources like wood chips and pellets are expensive (approx. 800 NOK per cubic meter).
- Burning wood chips in a densely populated area creates issues with soot and ash.
- A future tax on wood chips is expected, increasing costs further.
- Logistics related to fuel delivery and storage is a challenge.
- Modern geothermal solutions were considered, but the investment cost is too high for a reasonable payback period.

### Challenges in Greenhouse Heating

- Rapid temperature drops (e.g., when lights are turned off or due to sudden cold weather) can exceed the heat pump's immediate capacity.
- Thousands of lamps (600–750W each) generate significant heat and turning them off requires instant compensation.
- Energy curtains, used for moisture control, also let in cold air when opened, reducing insulation efficiency.
- Climate control is complex, with 23 climate zones tailored to different plants' needs.
- The greenhouse was originally built for high-temperature heating (80–90°C), based on cheap electricity and oil, making it less suited for low-temperature systems.

### The Future Potential

- A combination of LED lighting, heat pumps, and buffer tanks could optimize energy efficiency.
- LED lights reduce temperature fluctuations, allowing heat pumps to operate more consistently.
- Buffer tanks store excess heat, making use of daily temperature variations.
- Solar panels could further enhance efficiency and reduce energy costs.