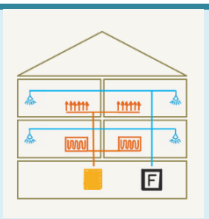
Flagship sustainable living in Kringlan, Stockholm

The Kringlan housing cooperative in Stockholm's Hammarby Sjöstad exemplifies how heat pumps can be applied in practice in cold climates, reducing emissions, improving cost efficiency and comfort.



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Key facts

Buildings

Location	*Stockholm, Sweden*
Construction	*2018*
Heat distribution	*Radiators*
Heated space	*25899 m²*
No. of apartments	*226*

Heat pump and source

Number of	*1*
Peak load	*250 kW*
Booster capacity	*8 kW*
Heating source	*Ground source*

Heating system

Annual building energy demand	*~900 MWh*
Heating temperature	*55 °C*

Other information

Coefficient of Performance	*3.7*
Investment	*110,000 SEK*
Financial performance	*Payback in 3.6 years*
Internal Rate of Return (IRR)	*27% (15yr lifespan)*
Annual savings	*~71 MWh (equivalent to 38,700 SEK in reduced energy costs)*

Additional benefits: Lower effect costs and reduced return temperature penalties

Picture: RISE Research Institutes of Sweden

Hammarby Sjöstad is one of Stockholm's flagship sustainable urban districts, built with strong ambitions for environmental performance and modern living standards. Within this district, Brf Kringlan stands out as one of the largest housing cooperatives, with 226 apartments and several commercial premises spread across a horseshoe-shaped residential block.

From the outset, Kringlan was designed with a strong focus on energy efficiency, digitalization, and integration with the broader urban energy system. Its approach provides valuable insights into how heat pumps can be applied in multi-family contexts, not only to reduce emissions but also to improve cost efficiency and comfort for residents.

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Energy and HVAC Systems

The building's technical infrastructure is both advanced and representative of best practices in Sweden:

• Ground Source Heat Pump: A central ground source heat pump supplies part of the building's heating demand, working alongside district heating.

• Heat Exchangers and VVC-Booster: The system integrates heat exchangers and a domestic hot water circulation booster, which significantly reduces unnecessary energy losses.

• Ventilation (FTX systems): Each stairwell is equipped with mechanical supply and exhaust air ventilation units, with high-efficiency heat recovery (at least 85%). This minimizes heating demand by reusing energy from exhaust air.

• Smart Digital Controls: Heating and ventilation are managed by an Integration Master & Communicator (IMC), connected to the RealEstateCore platform at IDUN. This allows operators to monitor, analyze, and optimize performance in real time.

• Metering and Monitoring: Ecoguard meters track indoor temperatures, electricity, and hot water use at the apartment and commercial unit level. Data is collected and visualized to support ongoing efficiency improvements.

• Future Readiness: Plans are in place to integrate solar PV and battery storage, while electric vehicle charging is already implemented across 131 garage spaces.

This combination of technologies reflects Sweden's broader trend of combining heat pumps, smart building management, and electrification to create resilient, efficient, and future-proof apartment buildings.

The Booster Heat Pump: Tackling Hot Water Losses

One of the most innovative features of Kringlan is the installation of a Booster heat pump. Domestic hot water circulation systems (VVC) are standard in multi-family buildings, ensuring that residents always have immediate access to hot water at their taps. However, these systems are also notorious for energy losses, as water is constantly circulated through the pipes, cooled, and then reheated.

At Kringlan, an 8 kW booster heat pump (COP 3.7) was installed specifically to address this issue. By capturing and reusing waste heat, the booster reduces the energy needed to maintain hot water circulation.

In essence, the booster heat pump transforms a hidden source of energy waste into a source of savings and efficiency. For the cooperative, this translates into lower operating costs, improved sustainability, and a clear return on investment.

Flagship sustainable district Hammarby Sjöstad, Stockholm

Lessons Learned from Kringlan

The Kringlan case offers several lessons that are directly relevant to Annex 62's international collaboration:

1. Heat Pumps as a Complement to District Heating

O In Sweden, heat pumps rarely replace district heating in large urban areas. Instead, they optimize it, reducing peak loads and addressing inefficiencies. This complementary role is crucial for highly urbanized contexts.

2. Digitalization is Key

O The use of platforms like RealEstateCore and Ecoguard highlights the importance of data-driven energy management. Heat pumps deliver their full potential only when combined with advanced monitoring and control.

3. Small-Scale Retrofits Can Deliver Big Impacts

O The VVC-Booster installation shows that even relatively small heat pump systems can have outsized impacts on both energy efficiency and cost savings. Such targeted measures are especially relevant for existing buildings where large retrofits may not be feasible.

4. Economic Viability Drives Adoption

O With a payback time of less than four years and a high IRR, the booster demonstrates that heat pump investments can be financially attractive, making them more likely to be adopted by housing cooperatives and property owners.

Implications for International Collaboration

For many countries, where fossil fuels are still the primary source of heating in multi-family buildings, the Kringlan case offers valuable inspiration:

- In regions with fossil-based district heating, similar heat pump boosters could help reduce emissions and costs.
- In gas-dominated apartment buildings, central heat pumps can replace boilers while offering cooling as an additional service.
- For cities struggling with grid constraints, the integration of solar PV, batteries, and smart controls, as planned in Kringlan, points toward a flexible and resilient urban energy system.

Conclusion: Heat Pumps as a Cornerstone of Urban Decarbonization

The Kringlan case study illustrates the growing role of heat pumps in transforming multi-family residential buildings into sustainable, efficient, and digitally managed energy systems.

Through HPT Annex 62, such examples are being documented and shared to accelerate the global transition away from fossil fuels in urban heating. For Sweden, participation in this project underscores its dual role as both a leader in sustainable heating and a partner in global knowledge exchange.

As cities worldwide look for ways to reduce emissions while ensuring comfort and affordability for their residents, the lessons from Kringlan, and from Sweden more broadly, show that heat pumps are not just a technical solution, but a cornerstone of urban decarbonization strategies.