

# CASE 1

## Skawen Residential with Integrated HP in combination of district heating

### Instantaneous Hot Water Supply:

The Skawen Residential incorporates a highly efficient, integrated Heat Pump system that utilizes R290, a natural refrigerant with exceptional thermodynamic properties. This advanced heat pump technology ensures an immediate and consistent supply of hot water to the strategically placed basement storage tanks. This design guarantees that hot water is readily available on demand, contributing to the overall comfort and convenience within the building.

### Primary Heating Source: Exhaust Air Heat Recovery:

A cornerstone of the Skawen Residential's energy-efficient design is the utilization of heat recovery from the Exhaust Air Heat Pump. This intelligent system captures and reuses thermal energy that would otherwise be expelled. This method forms the predominant source of heating for the building, responsible for satisfying a substantial 60-80% of the annual heating demand. This significant contribution is primarily realized during periods of moderate ambient temperatures and minimal building heat loss. By leveraging waste heat, the system considerably reduces the reliance on external energy sources, leading to substantial operational cost savings and a minimized environmental footprint.

### Supplemental Heating During Extreme Conditions:

While the heat recovery system effectively addresses the majority of the building's heating requirements, supplementary heat is necessary during periods of extreme winter conditions. In these instances, characterized by significantly low ambient temperatures, the demand for heating exceeds the capacity of the heat recovery system alone. To ensure consistent and uninterrupted building heating throughout the year, regardless of weather extremes, the Skawen Residential seamlessly integrates with existing district heating infrastructure. The basement storage tanks are specifically designed to accommodate this supplementary heat input, allowing for a smooth and efficient transition between heat sources as needed. This hybrid approach ensures optimal thermal comfort under all conditions, providing a resilient and reliable heating solution.

