

# CASE 3

Skawen Residential with in combination House HP and additional heat well

## Foundation of Efficient Heating

The Skawen Residential system operates on a principle of self-sufficiency, functioning within a building without requiring external energy inputs for its core warm water supply operations (excluding the use of R290 refrigerant). This system is engineered to deliver a baseline of warm water, ranging between 8 and 12 degrees Celsius, directly to the basement level of the building. Central Heat Pump serves as the primary source for immediate hot water, which is directly supplied to a series of strategically located storage tanks in the basement. This setup ensures a readily available supply of heated water for the building's various heating needs.

## Primary Heat Recovery Mechanism: Exhaust Air Heat Pump

The system is designed to prioritize energy efficiency. Therefore, the primary method of heat generation involves heat recovery from the Exhaust Air and Central Heat Pump. This ingenious approach captures and repurposes heat that would otherwise be expelled from the building. This heat recovery system is remarkably effective for a significant portion of the year, specifically during periods characterized by mild ambient temperatures. These conditions, typically representing 60-80% of the annual cycle, coincide with minimal heat loss through the building's envelope, making the exhaust air heat recovery sufficient to meet the heating demands.

## Maintaining Comfort in Extreme Winter Conditions: Auxiliary Heating

While the exhaust air heat recovery system excels in moderate climates, maintaining a consistent and comfortable building temperature throughout the year necessitates provisions for extreme winter conditions. When outdoor temperatures plummet significantly below freezing, auxiliary heating becomes essential. To address this need, the storage tanks are equipped with reliable electric heating elements. These elements are designed to activate and provide supplemental heat during periods of intense cold, ensuring a consistent and comfortable indoor environment regardless of the severity of the external weather conditions. This dual-system approach guarantees uninterrupted heating and maximizes energy efficiency by minimizing the use of electric heating when primary heat recovery is sufficient.

