

# Heat recovery by Danfoss

## Contact Data

Company Name: Orbital Farm  
Country: NL  
Contact Person: Bryson  
Contact information: scot.bryson@orbital.farm

## Technical input

User of Excess heat is: External use  
Type of heat recovery: HEX (separation) and HP (boost)  
Agreed Heat sales price: Data center cooling (fluid)

Excess heat available capacity: 10 MW  
Excess temp. supply side: 30 °C  
Excess temp. return side: 18 °C

Heat demanded by user: 50 MW  
Supply temp. from HP: 91 °C  
Return temp. from consumer: 32 °C

Availability and demand match: See diagram Energy & Emission

Current type of heating: Gas Boiler  
Cost of current type of heating: 0.08 EUR/kWh  
Cost of electricity: 0.08 EUR/kWh  
Agreed Heat sales price: 0.01 EUR/kWh

## Disclaimer

These are calculated values for guideline purposes and as such is not guarantee. Danfoss A/S cannot be held responsible for the stated energy- or emissions saving, they are intended only for indicative purpose, before an actual project is defined.

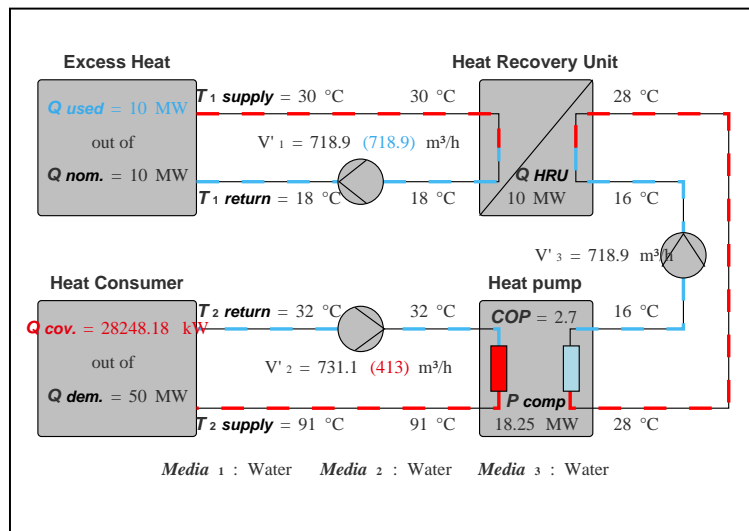
## Assumptions and methodology

A simple numerical method is used, which doesn't take into account transient behaviour. Pump power calculations are based on affinity laws and typical efficiencies on pumps & motors. Heat pump performance is based on empirical knowledge from applications with medium density refrigerants and using centrifugal compressors and shell & tube evaporators. Where separation heat exchangers are used, we have assumed a 2K approach temperature. CO2 emission factor for gas, oil and electric energy is based on 2021 EIA data. For gas and oil boilers we have assumed a total efficiency of 90% based on  $h_i$  [kJ/kg without condensation]. Heatloss in distribution lines are not included in calculation. Service cost estimated as a fixed percentage of CAPEX.

## Other

SW Build: 1.1.0 Release 2025  
Date of report: Fri Dec 19 2025

## System Design Conditions



## Financial: Supplier's Perspective

### CAPEX, Initial [k€]

- 7144.16 Heat recovery Unit (incl. pumps)  
- 9737.73 Hydraulics cost estimate  
**- 16881.89 Total CAPEX**

### OPEX, Annually [k€]

- 11.96 Electricity for pumps  
- 96 Service cost Heat Recovery Unit  
+ 872.68 Recovered energy Revenue  
**+ 764.72 Annual balance**

### TCO, Cumulative [k€]

Year 1 - 16117.17  
Year 2 - 15352.45  
Year 3 - 14587.73  
Year 4 - 13823.01  
Year 5 - 13058.29  
Year 6 - 12293.57  
Year 7 - 11528.86  
Year 8 - 10764.14  
Year 9 - 9999.42  
Year 10 - 9234.7

### Simple payback estimate excl. depreciation [Years]

22.1

## Financial: Consumer's Perspective

### CAPEX, Initial [k€]

- 19418.25 Heat Pump (incl. pumps)  
- 30668.25 Hydraulics cost estimate  
**- 50086.5 Total CAPEX**

### OPEX, Annually [k€]

- 23.46 Electricity for pumps  
- 4012.33 Electricity for Heat pump  
- 240 Service cost Heat Pump  
+ 6981.47 Operating cost Savings  
**+ 2705.68 Annual balance**

### TCO, Cumulative [k€]

Year 1 - 47380.82  
Year 2 - 44675.14  
Year 3 - 41969.47  
Year 4 - 39263.79  
Year 5 - 36558.11  
Year 6 - 33852.43  
Year 7 - 31146.75  
Year 8 - 28441.07  
Year 9 - 25735.4  
Year 10 - 23029.72

### Simple payback estimate excl. depreciation [Years]

18.4

## Annual Energy and Emission

