

# 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: 60 °C  
Excess temp. return side: 48 °C

Heat demanded by user: 10 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.

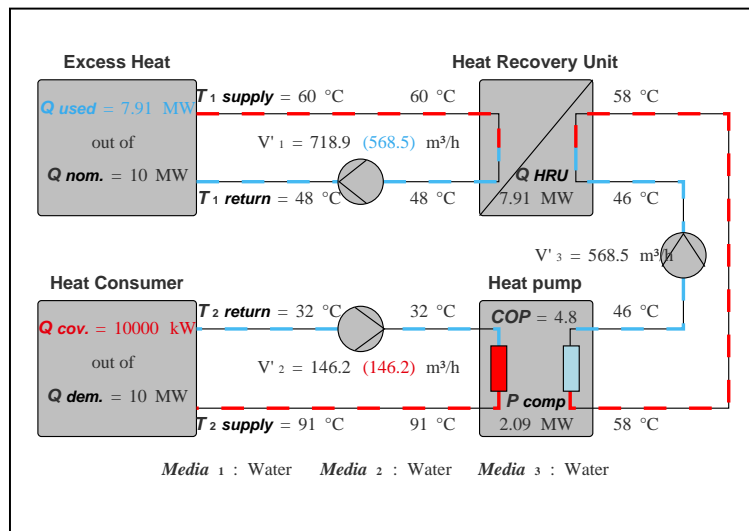
## Assumptions and methodology

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: Thu Dec 18 2025

## System Design Conditions



## Financial: Supplier's Perspective

### CAPEX, Initial [k€]

- 1779.29 Heat recovery Unit (incl. pumps)  
- 2425.23 Hydraulics cost estimate  
**- 4204.52 Total CAPEX**

### OPEX, Annually [k€]

- 15.81 Electricity for pumps  
- 19.2 Service cost Heat Recovery Unit  
+ 692.73 Recovered energy Revenue  
**+ 657.72 Annual balance**

### TCO, Cumulative [k€]

Year 1 - 3546.8  
Year 2 - 2889.07  
Year 3 - 2231.35  
Year 4 - 1573.63  
Year 5 - 915.91  
Year 6 - 258.19  
Year 7 + 399.54  
Year 8 + 1057.26  
Year 9 + 1714.98  
Year 10 + 2372.70

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

6.4

## Financial: Consumer's Perspective

### CAPEX, Initial [k€]

- 3883.65 Heat Pump (incl. pumps)  
- 6133.65 Hydraulics cost estimate  
**- 10017.3 Total CAPEX**

### OPEX, Annually [k€]

- 28.01 Electricity for pumps  
- 1466.14 Electricity for Heat pump  
- 48 Service cost Heat Pump  
+ 5541.86 Operating cost Savings  
**+ 3999.7 Annual balance**

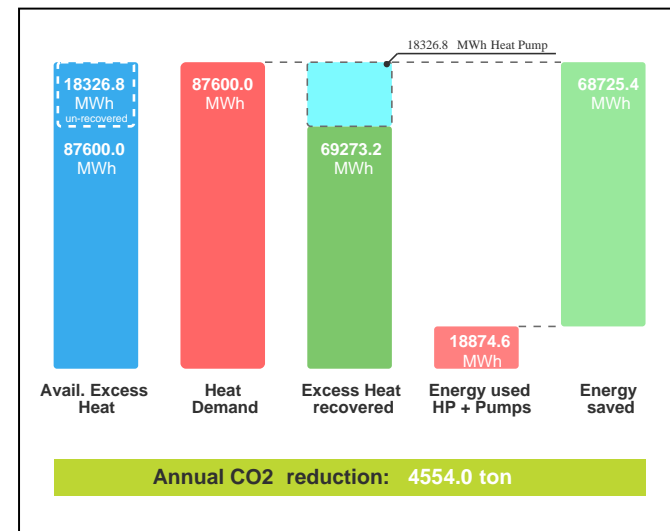
### TCO, Cumulative [k€]

Year 1 - 6017.6  
Year 2 - 2017.9  
Year 3 + 1981.80  
Year 4 + 5981.51  
Year 5 + 9981.21  
Year 6 + 13980.91  
Year 7 + 17980.61  
Year 8 + 21980.31  
Year 9 + 25980.01  
Year 10 + 29979.72

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

2.5

## Annual Energy and Emission



ENGINEERING  
TOMORROW

