

# Heat recovery by Danfoss

## Contact Data

Company Name: Orbital Farm  
Country: NL  
Contact Person: Bryson  
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## 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: 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.

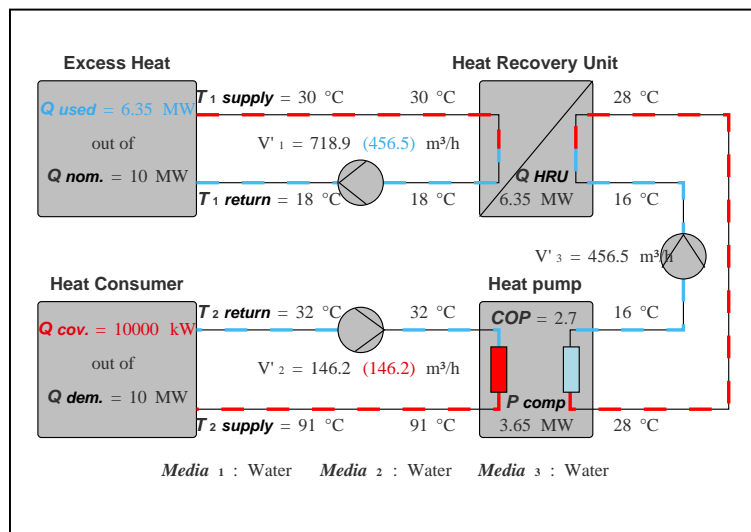
## Assumptions and methodology

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: Fri Dec 19 2025

## System Design Conditions



## Financial: Supplier's Perspective

### CAPEX, Initial [k€]

- 1428.83 Heat recovery Unit (incl. pumps)  
- 1947.54 Hydronics cost estimate  
**- 3376.38 Total CAPEX**

### OPEX, Annually [k€]

- 2.39 Electricity for pumps  
- 19.2 Service cost Heat Recovery Unit  
+ 174.53 Recovered energy Revenue  
**+ 152.94 Annual balance**

### TCO, Cumulative [k€]

Year 1 - 3223.43  
Year 2 - 3070.49  
Year 3 - 2917.55  
Year 4 - 2764.61  
Year 5 - 2611.66  
Year 6 - 2458.72  
Year 7 - 2305.78  
Year 8 - 2152.84  
Year 9 - 1999.89  
Year 10 - 1846.95

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

22.1

## Financial: Consumer's Perspective

### CAPEX, Initial [k€]

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

### OPEX, Annually [k€]

- 4.69 Electricity for pumps  
- 802.45 Electricity for Heat pump  
- 48 Service cost Heat Pump  
+ 1396.28 Operating cost Savings  
**+ 541.14 Annual balance**

### TCO, Cumulative [k€]

Year 1 - 9476.16  
Year 2 - 8935.03  
Year 3 - 8393.89  
Year 4 - 7852.76  
Year 5 - 7311.62  
Year 6 - 6770.49  
Year 7 - 6229.35  
Year 8 - 5688.21  
Year 9 - 5147.08  
Year 10 - 4605.94

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

18.4

## Annual Energy and Emission

