

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: 10 MW
Supply temp. from HP: 45 °C
Return temp. from consumer: 35 °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.

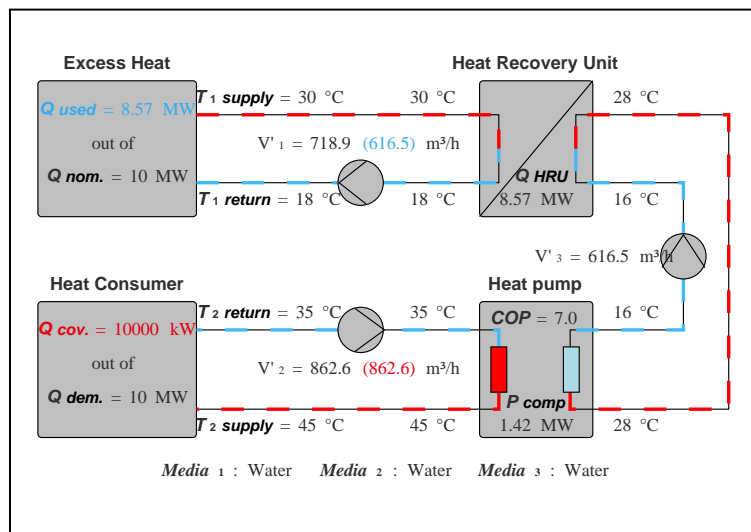
Assumptions and methodology

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: Tue Dec 16 2025

System Design Conditions



Financial: Supplier's Perspective

CAPEX, Initial [k€]

- 1929.49 Heat recovery Unit (incl. pumps)
- 2629.96 Hydronics cost estimate
- 4559.44 Total CAPEX

OPEX, Annually [k€]

- 17.14 Electricity for pumps
- 19.2 Service cost Heat Recovery Unit
+ 751.21 Recovered energy Revenue
+ 714.87 Annual balance

TCO, Cumulative [k€]

Year 1 - 3844.57
Year 2 - 3129.7
Year 3 - 2414.83
Year 4 - 1699.95
Year 5 - 985.08
Year 6 - 270.21
Year 7 + 444.66
Year 8 + 1159.53
Year 9 + 1874.41
Year 10 + 2589.28

Simple payback estimate excl. depreciation [Years]

6.4

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€]

- 89.11 Electricity for pumps
- 998.29 Electricity for Heat pump
- 48 Service cost Heat Pump
+ 6009.71 Operating cost Savings
+ 4874.31 Annual balance

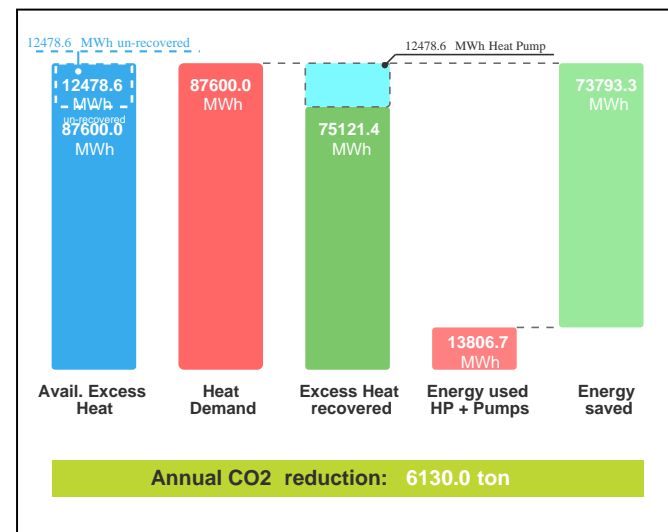
TCO, Cumulative [k€]

Year 1 - 5142.99
Year 2 - 268.67
Year 3 + 4605.64
Year 4 + 9479.96
Year 5 + 14354.27
Year 6 + 19228.58
Year 7 + 24102.90
Year 8 + 28977.21
Year 9 + 33851.53
Year 10 + 38725.84

Simple payback estimate excl. depreciation [Years]

2.1

Annual Energy and Emission



ENGINEERING
TOMORROW

