Heat recovery by Danfoss

ENGINEERING TOMORROW

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)
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:	28 °C
Return temp. from consumer:	16 °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.

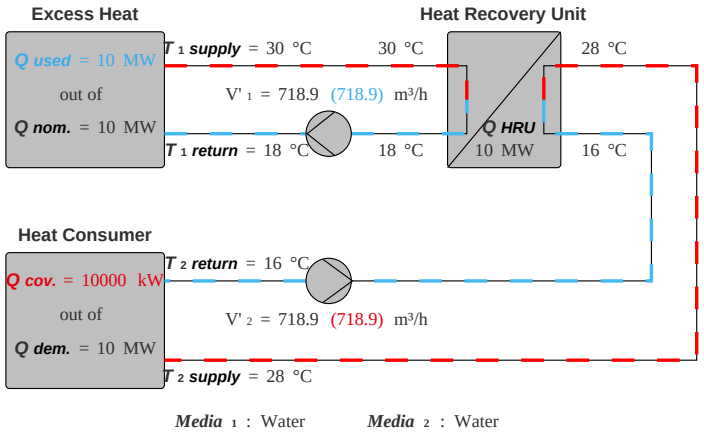
Assumptions and methodology

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 hi [kJ/kg without condensation]. Heatloss in distribution lines are not included in calculation. Service cost estimated as a fixed percentage of CAPEX.

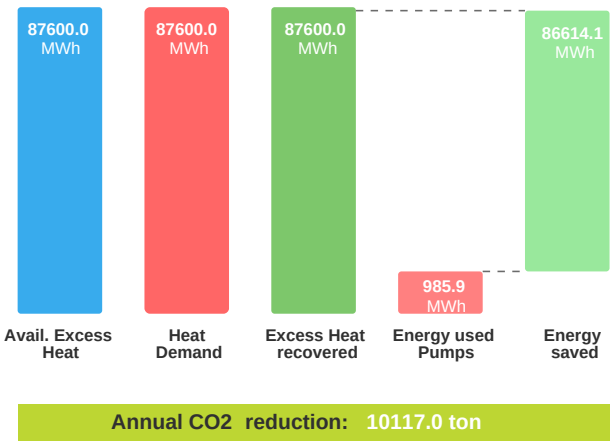
Other

SW Build:	1.1.0 Release 2025
Date of report:	Thu Dec 18 2025

System Design Conditions



Annual Energy and Emission



Financial: Supplier's Perspective

CAPEX, Initial [k€]

- 2051.15	Heat recovery Unit (incl. pumps)
- 1025.57	Hydronics cost estimate
- 3076.72	**Total CAPEX**

OPEX, Annually [k€]

- 19.72	Electricity for pumps
- 19.2	Service cost Heat Recovery Unit
+ 876	Recovered energy Revenue
+ 837.08	**Annual balance**

TCO, Cumulative [k€]

Year 1	- 2239.64
Year 2	- 1402.56
Year 3	- 565.48
Year 4	+ 271.60
Year 5	+ 1108.68
Year 6	+ 1945.76
Year 7	+ 2782.84
Year 8	+ 3619.92
Year 9	+ 4457.00
Year 10	+ 5294.08

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

3.7

Financial: Consumer's Perspective

CAPEX, Initial [k€]

- 1025.57	Hydronics cost estimate
- 1025.57	**Total CAPEX**

OPEX, Annually [k€]

- 59.15	Electricity for pumps
+ 7027.2	Operating cost Savings
+ 6968.05	**Annual balance**

TCO, Cumulative [k€]

Year 1	+ 5942.48
Year 2	+ 12910.52
Year 3	+ 19878.57
Year 4	+ 26846.62
Year 5	+ 33814.66
Year 6	+ 40782.71
Year 7	+ 47750.76
Year 8	+ 54718.80
Year 9	+ 61686.85
Year 10	+ 68654.90

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

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