

Heat recovery by Danfoss

ENGINEERING
TOMORROW



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: 45 °C
Excess temp. return side: 33 °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.

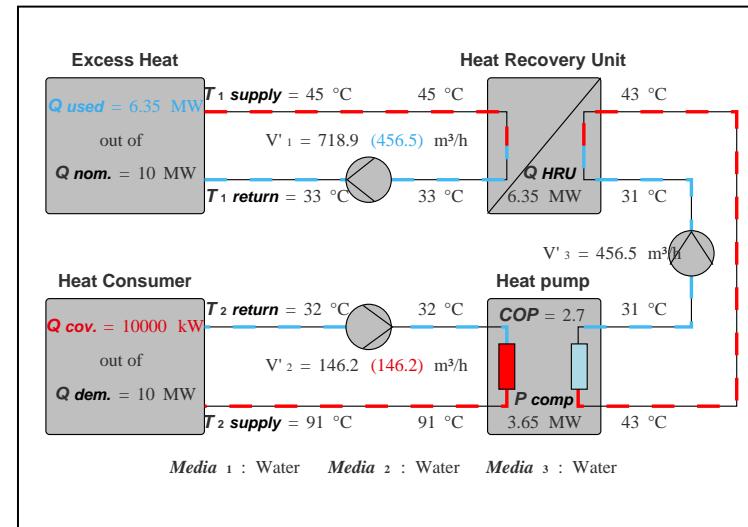
Assumptions and methodology

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

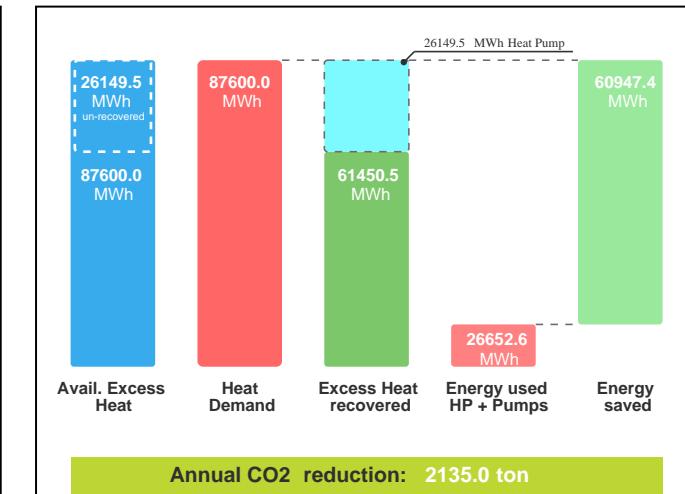
Other

SW Build: 1.1.0 Release 2025
Date of report: Tue Dec 16 2025

System Design Conditions



Annual Energy and Emission



Financial: Supplier's Perspective

CAPEX, Initial [k€]	OPEX, Annually [k€]	TCO, Cumulative [k€]	Simple payback estimate excl. depreciation [Years]
- 1578.36 Heat recovery Unit (incl. pumps)	- 14.02 Electricity for pumps	Year 1 - 3148.43	
- 2151.36 Hydronics cost estimate	- 19.2 Service cost Heat Recovery Unit	Year 2 - 2567.15	
- 3729.72 Total CAPEX	+ 614.51 Recovered energy Revenue	Year 3 - 1985.87	
	+ 581.28 Annual balance	Year 4 - 1404.59	
		Year 5 - 823.3	
		Year 6 - 242.02	
		Year 7 + 339.26	
		Year 8 + 920.54	
		Year 9 + 1501.82	
		Year 10 + 2083.11	

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Financial: Consumer's Perspective

CAPEX, Initial [k€]	OPEX, Annually [k€]	TCO, Cumulative [k€]	Simple payback estimate excl. depreciation [Years]
- 3883.65 Heat Pump (incl. pumps)	- 26.22 Electricity for pumps	Year 1 - 7267.44	
- 6133.65 Hydronics cost estimate	- 2091.96 Electricity for Heat pump	Year 2 - 4517.58	
- 10017.3 Total CAPEX	- 48 Service cost Heat Pump	Year 3 - 1767.72	
	+ 4916.04 Operating cost Savings	Year 4 + 982.14	
	+ 2749.86 Annual balance	Year 5 + 3732.00	
		Year 6 + 6481.86	
		Year 7 + 9231.72	
		Year 8 + 11981.58	
		Year 9 + 14731.44	
		Year 10 + 17481.30	

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