

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) 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.

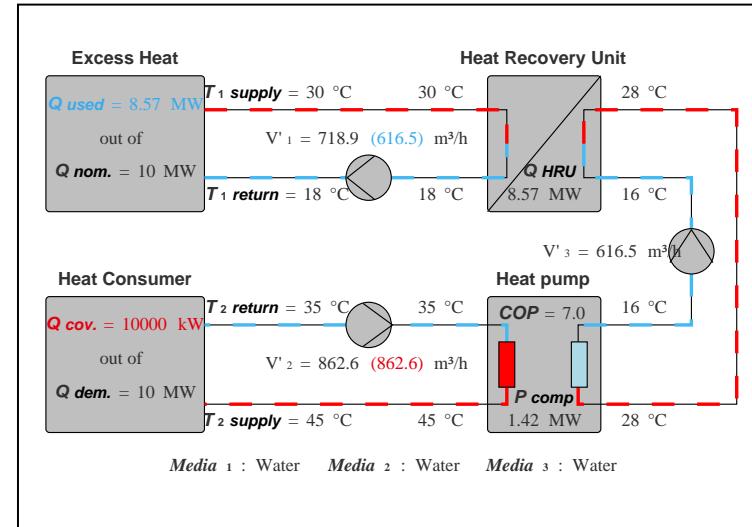
Assumptions and methodology

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

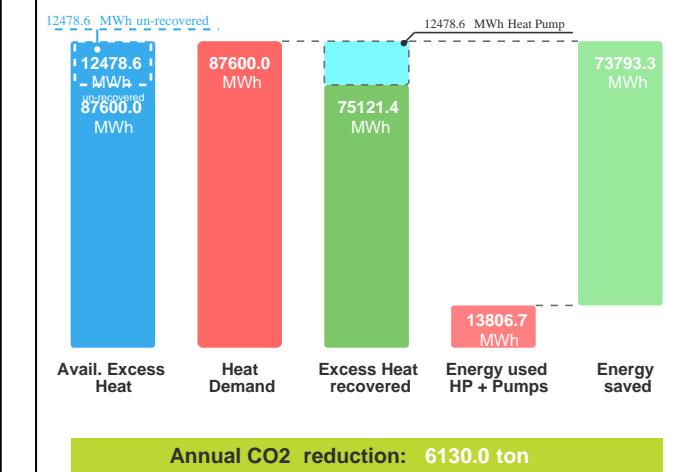
Other

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]
- 1929.49 Heat recovery Unit (incl. pumps)	- 17.14 Electricity for pumps	Year 1 - 3844.57	
- 2629.96 Hydronics cost estimate	- 19.2 Service cost Heat Recovery Unit	Year 2 - 3129.7	
- 4559.44 Total CAPEX	+ 751.21 Recovered energy Revenue	Year 3 - 2414.83	
	+ 714.87 Annual balance	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	

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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)	- 89.11 Electricity for pumps	Year 1 - 5142.99	
- 6133.65 Hydronics cost estimate	- 998.29 Electricity for Heat pump	Year 2 - 268.67	
- 10017.3 Total CAPEX	- 48 Service cost Heat Pump	Year 3 + 4605.64	
	+ 6009.71 Operating cost Savings	Year 4 + 9479.96	
	+ 4874.31 Annual balance	Year 5 + 14354.27	
		Year 6 + 19228.58	
		Year 7 + 24102.90	
		Year 8 + 28977.21	
		Year 9 + 33851.53	
		Year 10 + 38725.84	

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