

Decarbonising heating

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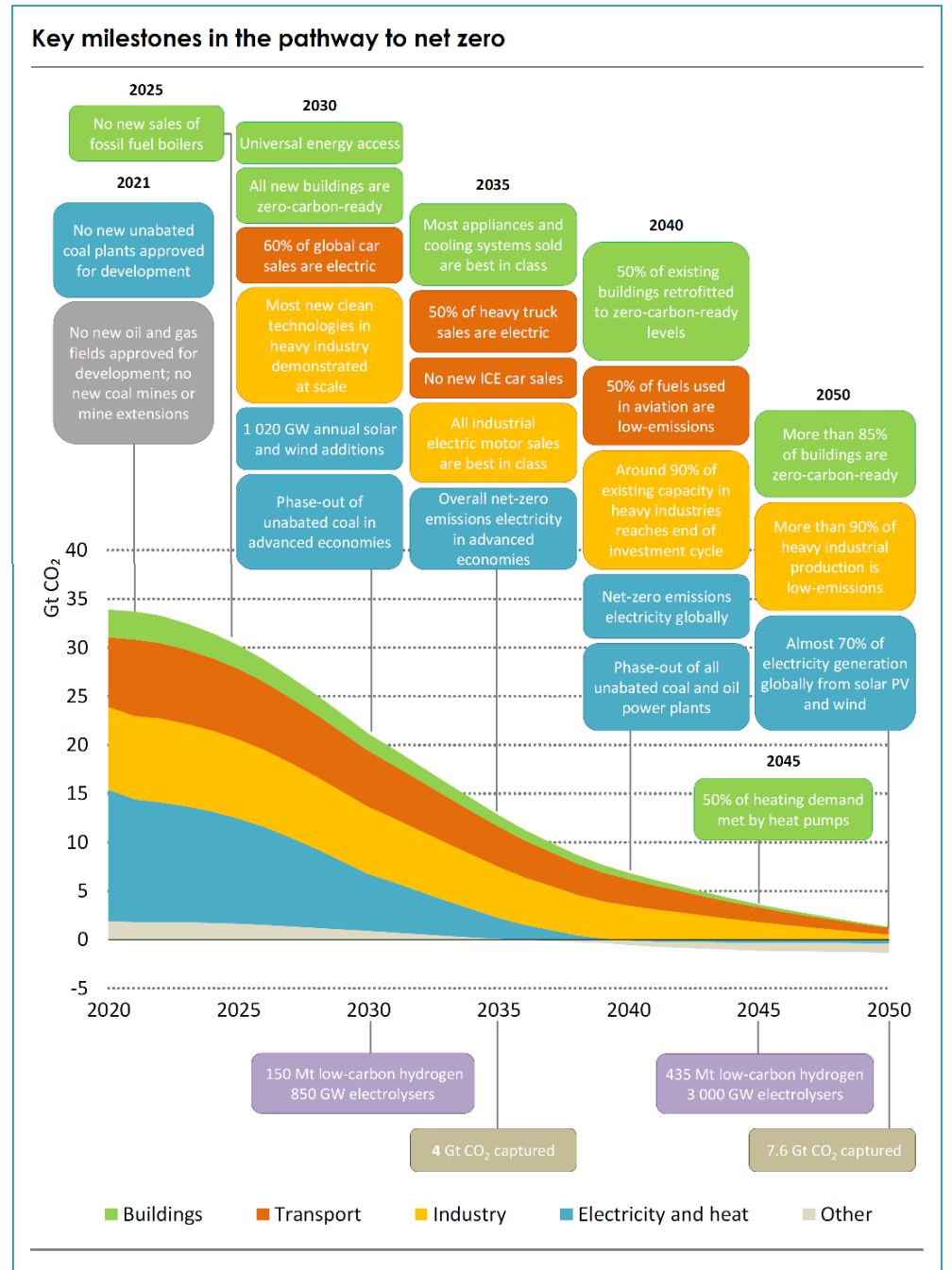
Global CO₂ emission

Pathway to net zero

A Roadmap for the Global Energy Sector (IEA)

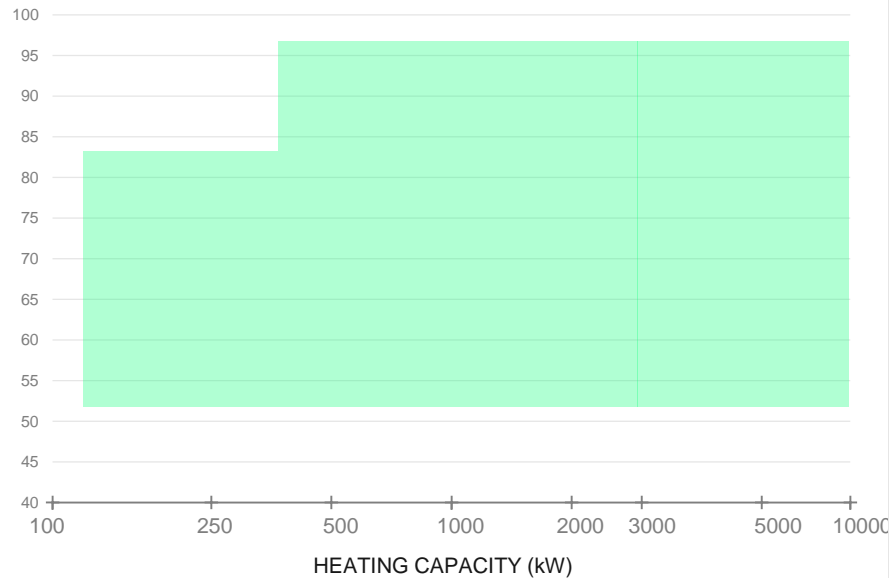
2035: Most installation needs to be best in class cooling and heating efficiency

2045: 50% of heating demand met by heat pumps = 4.5EJ

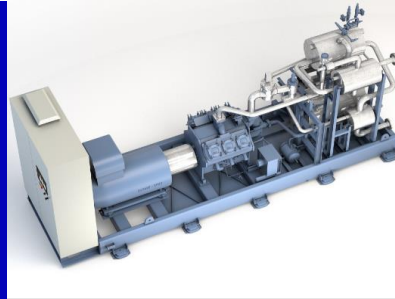


GEA Ammonia Heat Pump Portfolio

Temperature – Capacity Application Diagram



The highlighted area shows the range of supply temperatures for the heating demand and the heating capacity at ambient heat source level.



RedGenium

Standard reciprocating compressor heat pump

- 11 types
- up to +95 °C
- 150 – 2,500 kW

Highlights:

- highest supply temperatures
- best-in-class efficiency
- lowest energy consumption
- lowest total costs



RedAstrum

Standard screw compressor heat pump

- 7 types
- up to +85 °C
- 500 – 3,000 kW

Highlights:

- low footprint
- high differential pressures
- large heat source to heat sink temperature lifts



Blu-Red Fusion

Standard chiller plus heat pump combination

- multiple types
- up to +95 °C
- 500 – 2,500 kW

Highlights:

- combined cooling and heating
- highest efficiency
- unique flexibility: full cooling and heating, reduced heating and chiller-only modes possible



Custom unit

Customized recip. and screw heat pumps

- all compressors
- up to +95 °C
- 250 – 10,000 kW

Highlights:

- widest application range
- up to highest capacities
- many flexible design and configuration options

Blu – Red Fusion



2.0 ... 3.0m

3.5 ... 4.5m

6.5m ... 8.0m

GEA Omni
control panel inside

8,000 ... 20,000 kg
total weight

80 ... 99 dBA
sound pressure level

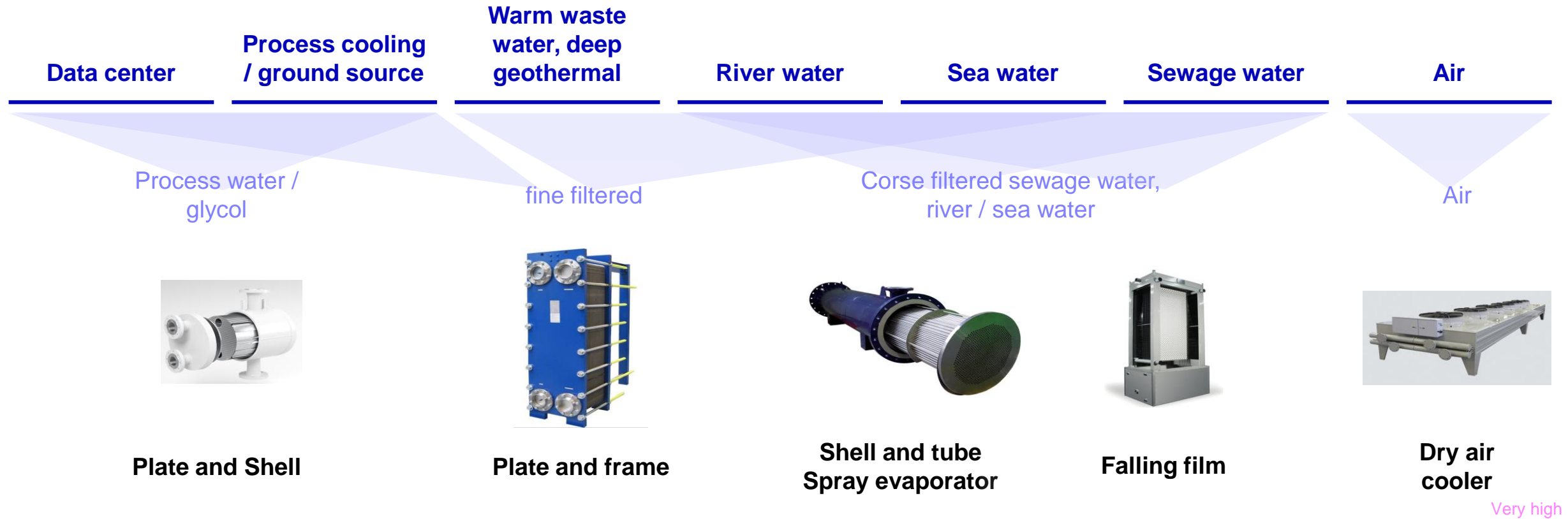
22 ... 165 kg
NH₃ refrigerant charge

700 – 3500 kW
Heating duty

Upto 95°C
Heating water

Heat Exchanger Overview

Heat extraction from heat source is the main driver to differentiate between standard & bespoke



Very low

Ammonia charge

Standard heat pumps

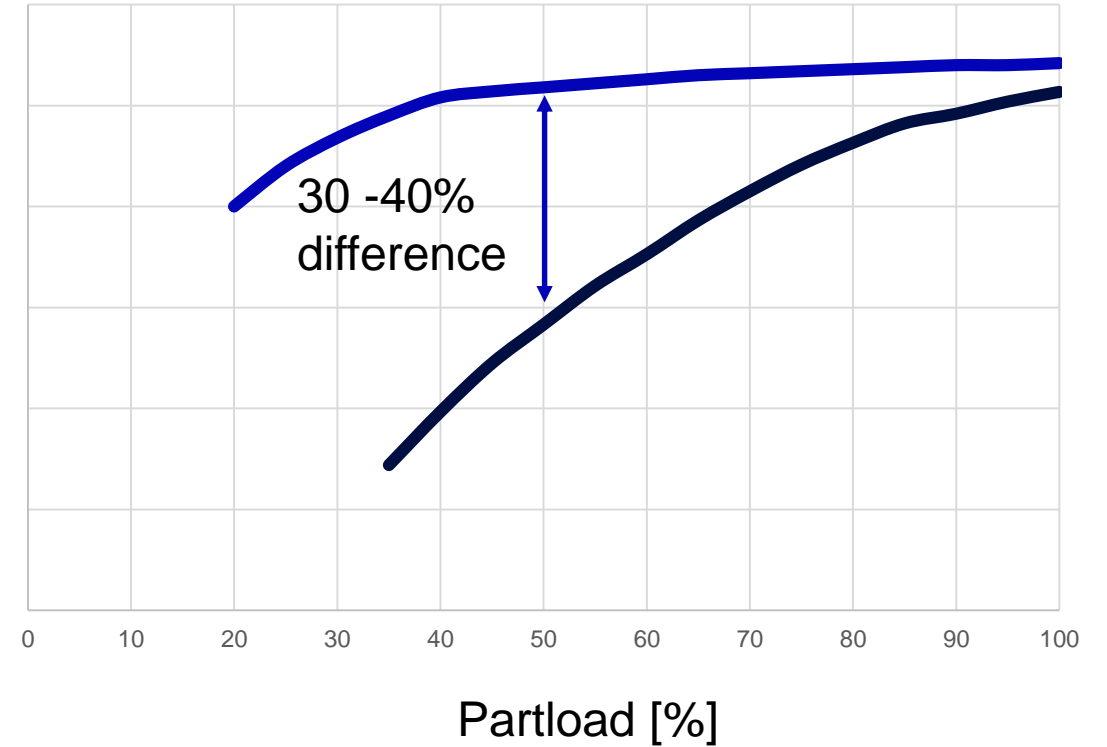
Alternative is indirect cooling with intermediate water/glycol circuit, or compressor package sales only

Focus on ammonia

	REDGENIUM	R1234ze HEAT PUMP
Chilled water inlet	15°C	15°C
Chilled water outlet	10°C	10°C
Cooling duty	553 kW	494 kW
Heating water in	45°C	45°C
Heating water out	65°C	65°C
Heating duty	700 kW	701 kW
Heating COP	4.06	3.31
Refrigerant charge	41 kg	140 kg

20% difference

$$\text{COP} = \frac{\text{Heat output [kW]}}{\text{Electrical input [kW]}}$$



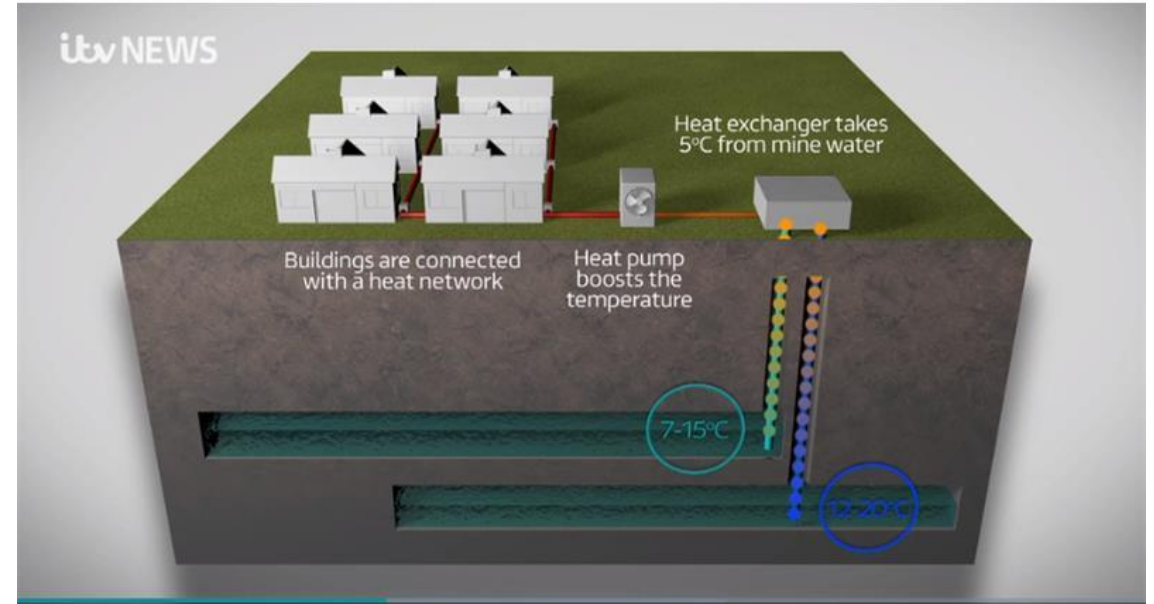
Case studies

CASE 1 – Gateshead, District Heating

Heat Source: Underground mine water

Heat pump specification

- Filtered mine water.
- 140 m³/h at 15°C ground source water
- 4000 kW heat source
- 2100 kW of absorbed power.
- 4 x GEA screw compressors 2 low stage and 2 high stage
- 6000 kW of heating duty – heating district water from +65°C to 80°C with a design COP of 3.0



CASE 1 – Gateshead, District Heating

Heat Source: Underground mine water

- Start-up: September 2022

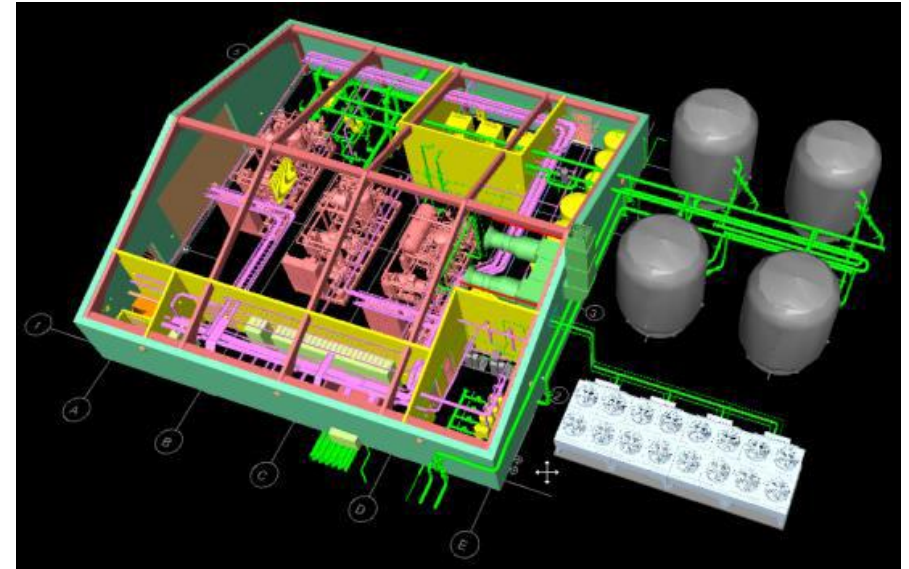


CASE 2 – Swaffham, District Heating

Heat Source: Air / ground source water

2000 kW heat pump duty

- 2 x 750 kW ground source heat pump
 - Closed ground loop piles
 - 8°C water/glycol
 - Heating network: 55°C to 75°C
 - In summertime heat network can be reduced to 65°C
- 1 x 500 kW air source heat pump
 - 4 aircoolers (-5°C to +25°C)
 - Low loss defrost system
 - Heating network: 55°C to 75°C



Heating COP: 2.5 – 3.5

CASE 2 – Swaffham, District Heating

Heat Source: Air / ground source water

- Start-up: August 2022



Contact Information



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GEA

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Using heat pumps to cool our warming planet

CONTACT OUR HEAT PUMP EXPERTS

Ready to decarbonize your heat?

Contact us

Heat to Cool Process heating District heating eCalculator & webinars Customer cases

Heat to cool our planet for generations to come

GEA RAISES THE BAR FOR STANDARD HEAT PUMPS TO +95 °C

GEA Heating & Refrigeration Technologies continues to consistently expand its heat pump portfolio. The GEA ReoGenium heat pump combined with the brand new GEA Grasso V XHP reciprocating compressor enables the provision of temperatures of +95 °C at the best efficiency.

Read more

EXPLORE THE FULL RANGE OF GEA HEAT PUMPS

Heat accounts for more than half of the global total final energy consumption, mostly produced from fossil fuels. If the ambitious targets set in the historic Paris Agreement are to be achieved, we need to accelerate heat decarbonization and create a better world for our future generations.

If we want to limit global warming to 1.5 degrees Celsius compared to pre-industrial levels, we need a real game changer. When it comes to decarbonizing heat, heat pump technology with a proven track record is just that. In the drive for a carbon-neutral future, energy-efficient heat pumps are rapidly becoming the technology of choice. Using heat pumps to cool our warming planet makes a lot of sense.

4 reasons why

Have you already considered heat pump technology? Here are four reasons why:

- 1. It lowers your energy consumption**
Heat pump solutions, either combined with energy-efficient refrigeration systems, or stand alone can improve your heating performance significantly.
- 2. It decreases your operating costs**
By replacing the fossil fuel based heating system with a highly efficient heat pump, you will lower your operating costs.
- 3. It reduces your carbon footprint**
By reducing or eliminating the use of fossil fuel, a heat pump can help you pave the way towards your zero-emission target.
- 4. It meets your sustainability goals**
A heat pump solution is a future-proof investment, especially in the face of ever-stricter guidelines on carbon emissions and environmental compatibility.

Read more

DOWNLOAD

Application Brochure - Industrial Heat Recovery PDF (1,68 MB)

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