



Industrial scale decarbonization

A worker wearing safety glasses and gloves is focused on working on a large, blue industrial machine. The machine has various components, including yellow circular parts and metal pipes. The background is slightly blurred, showing more of the industrial environment.

Delivering low-cost decarbonized steam for the future of industry

1. Highest Efficiency Electrification
2. Cost-effective, Modular, Repeatable Design
3. Drop-in Replacement; Reducing Construction Costs & Zero Downtime

Introducing: **Boiler 2.0**

- Modular Air-Sourced Steam Heat Pump
- No Waste Heat Required

Solves decarbonization barriers to adoption

- Operationally efficient
- Easy Installation
- Running in days not months

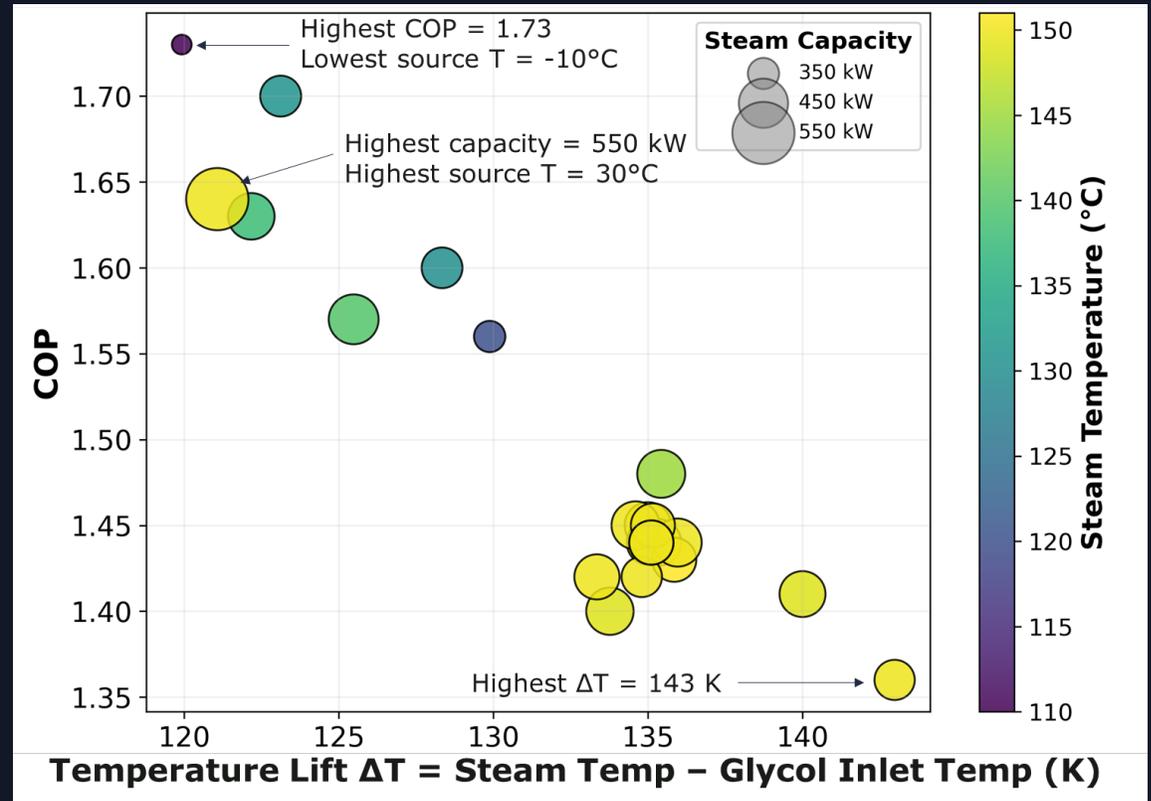


From Industrial Scale Laboratory Pilot...

Technology development starting in 2023



Liquid-Source Prototype: 15°C to 150°C

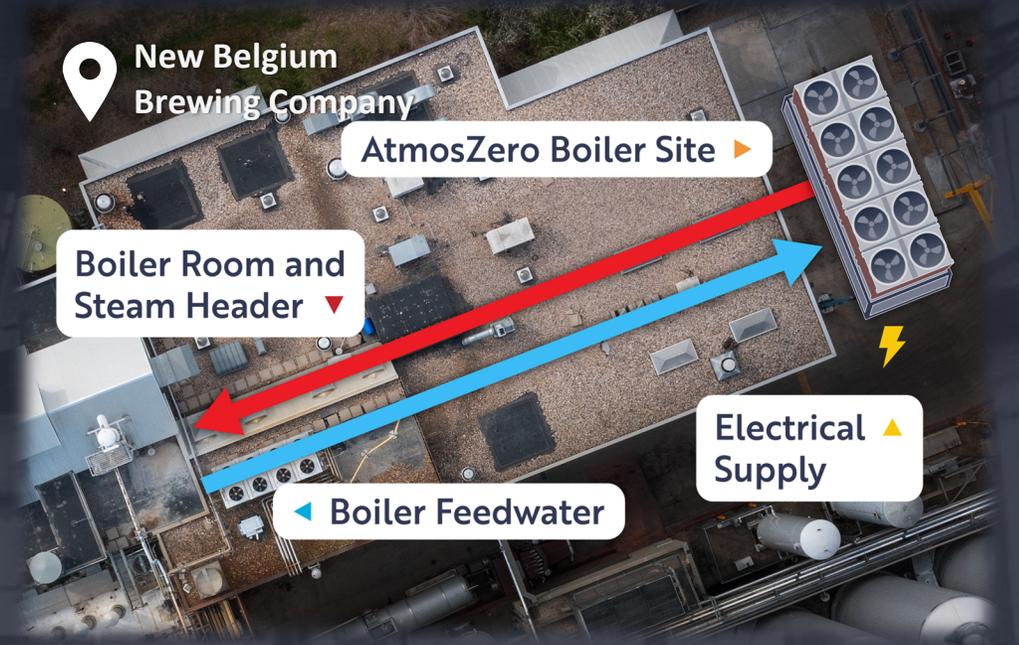


... To First Commercial Installation

PHASE 1 – The Pilot

Meet 1/3 of steam demand

- Replace one natural gas boiler in the Fort Collins facility
- 90psi/165°C, 2,200 lb/hour saturated steam
- In-field service. Q2'2025.



- New Belgium Brewing was present for a successful factory acceptance test (FAT) at AtmosZero's manufacturing facility
- The heat pump was shipped and installed on 5/16/25
- 24/7 operation began on Sunday, 6/22/25



...to First Commercial Installation

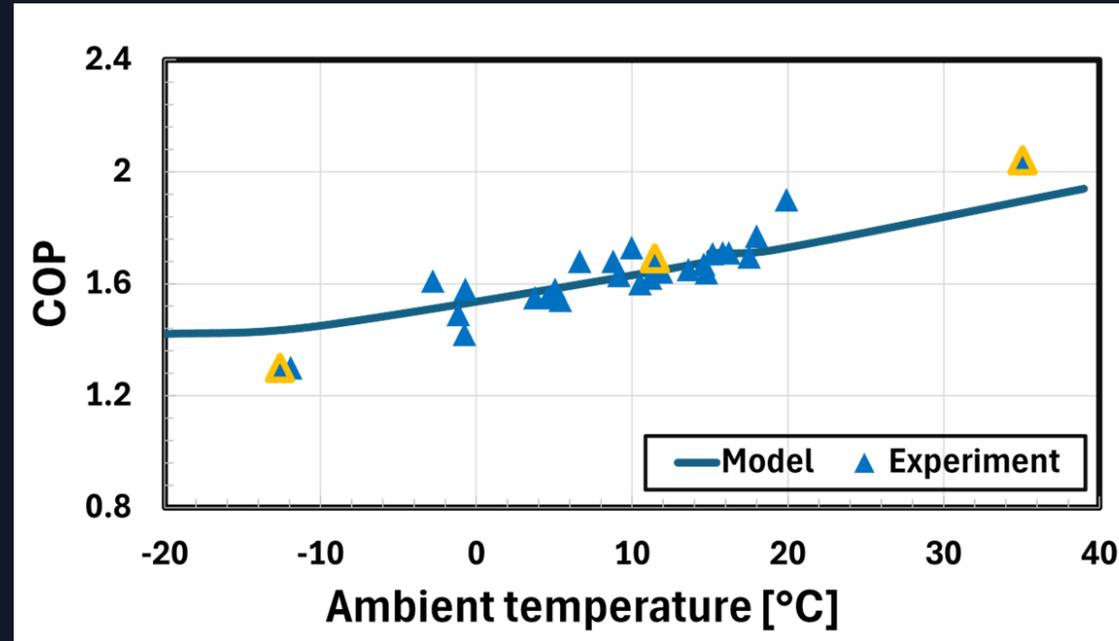


Table 1. Key Performance Metrics at Low, Medium, and High Source Temperatures

Air Temperature	-12.6°C	11.5°C	35.0°C
Steam Temperature	150°C	149°C	149°C
Steam Heat Duty	636 kW	565 kW	589 kW
Calculated Steam Flow Rate	0.25 kg/s	0.24 kg/s	0.24 kg/s
Evaporator Heat Duty	234 kW	244 kW	326 kW
Total Electrical Power	490 kW	327 kW	289 kW
COP	1.30	1.73	2.04

Operation Profile

New Belgium Brewing

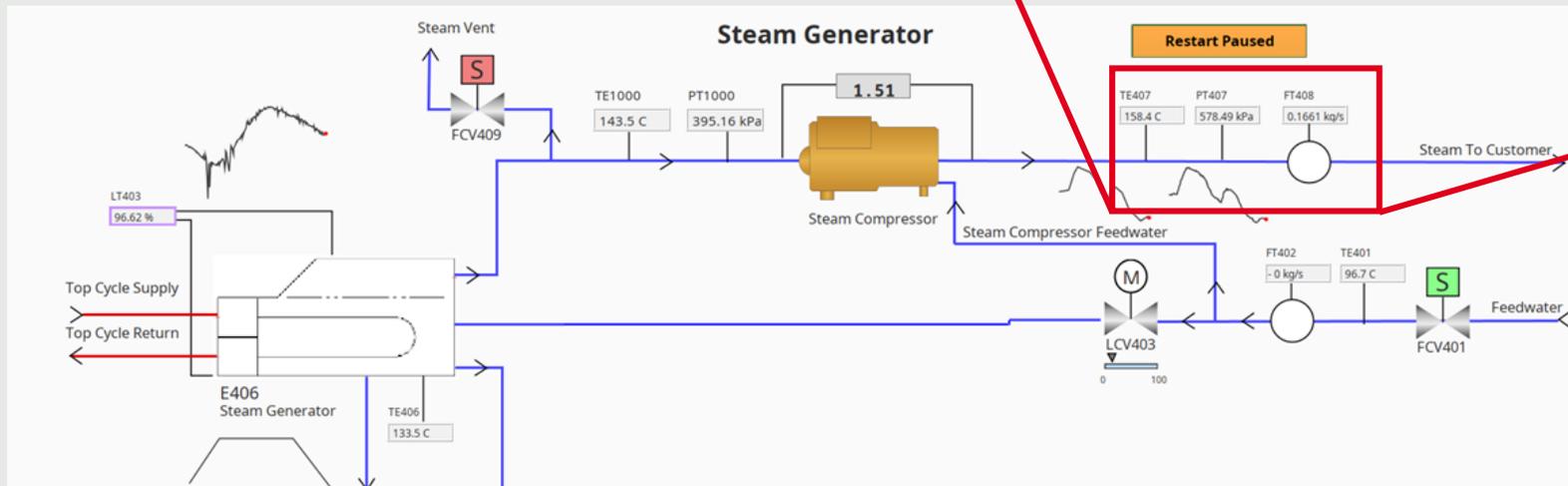
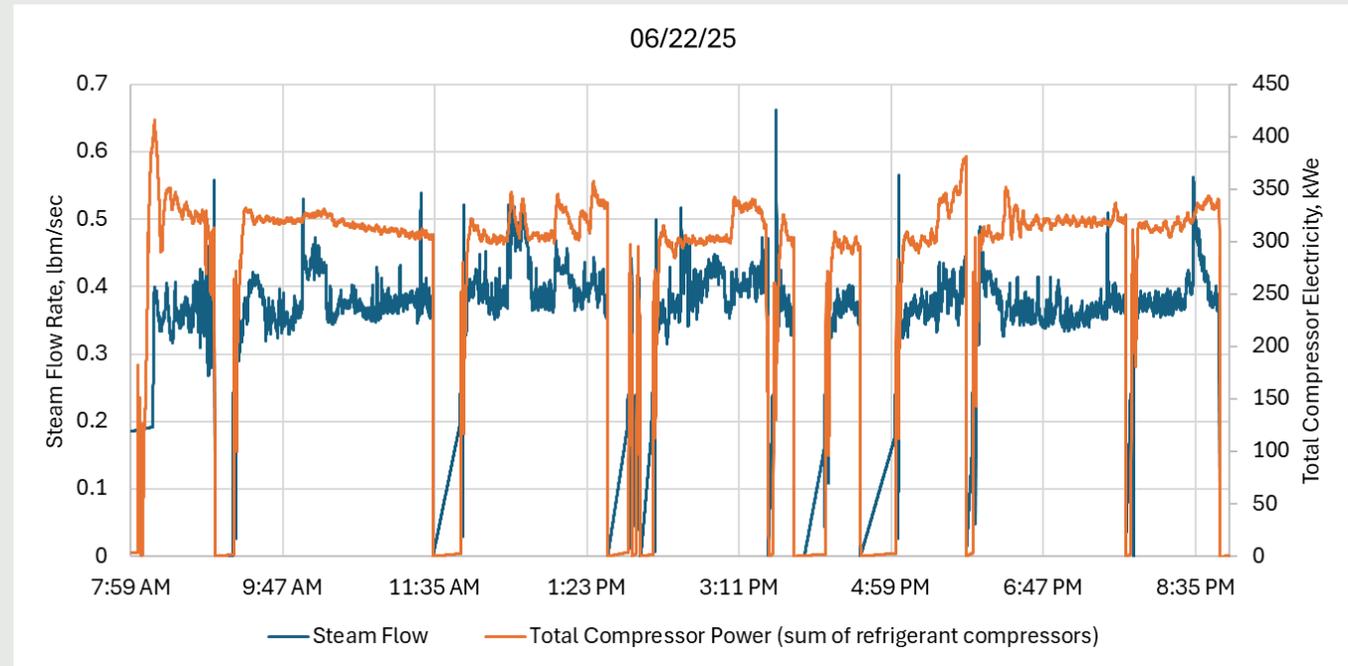
Steam header pressure and steam flow rate over normal day. Boiler 2.0 will shut down when pressure gets too high, and then turn back on when it gets below a certain pressure.

Time to Steam:

- Cold start – under 10 mins
- Warm start – under 5 mins

Asset Set up:

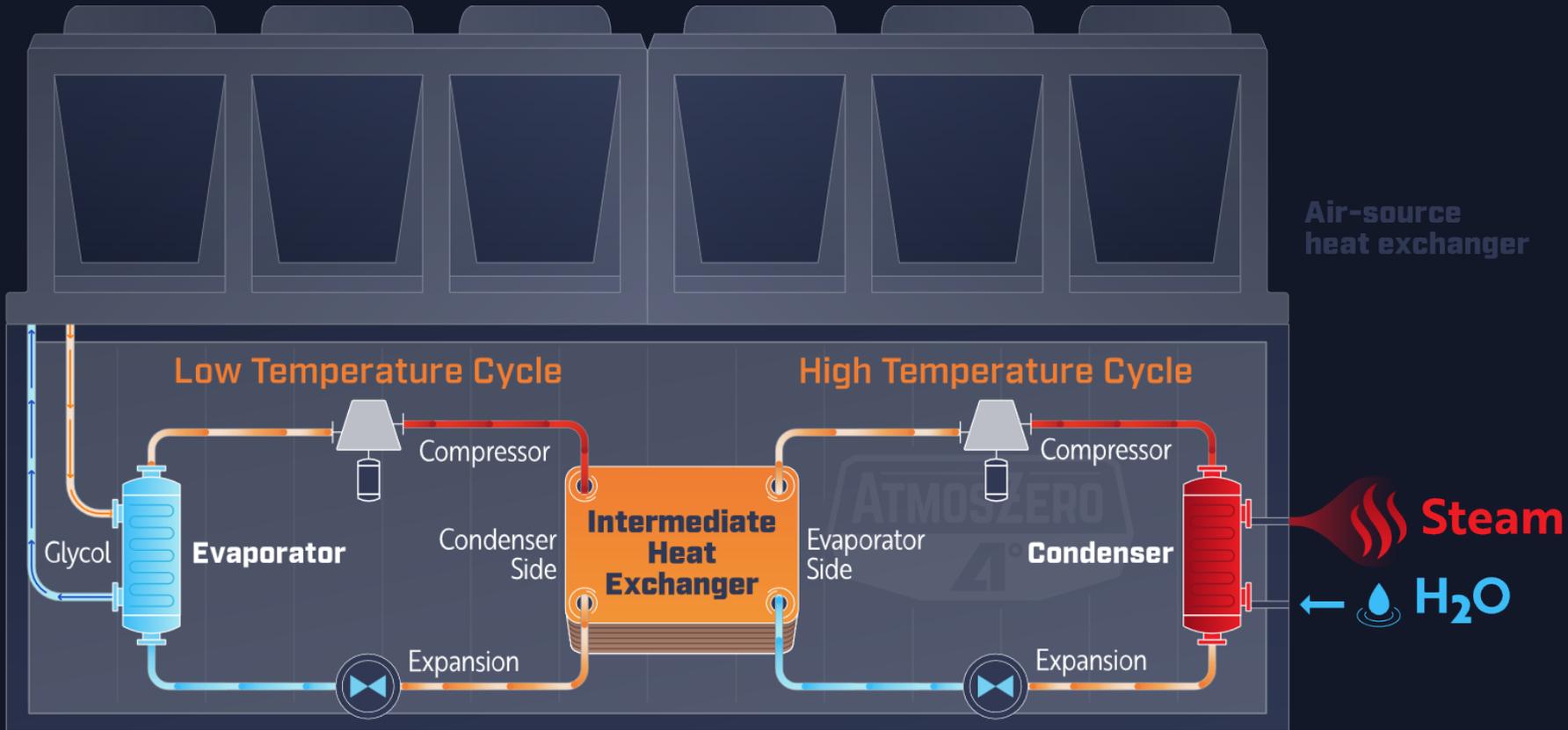
- Boiler 2.0 + (1x) gas boiler => Base load
- Boiler 2.0 + (2x) gas boilers => Peak load
- 1x gas boiler -> Minimum loads



Focus Moving Forward:

1 MW_{th} Heat Pumps & Full-Scale Factory Operations

Boiler 2.0 Specifications



Schematic not to scale

 **Nominal duty**
Up to 1 MW thermal

 **Voltage; current**
480 V 3-phase FLA: 1500A
International Voltages Available

 **Output flow**
Up to 3,400 lb/hr saturated steam

 **Output temperature/pressure**
120-153°C / 248-307 °F
1.03 – 4.13 Bar(g) / 15-60 PSIG
60-150PSIG for 2027 deliveries

 **Heat source**
Air or water

 **Inlet air temperature**
-20°C (- 4°F) to 40°C (104°F)

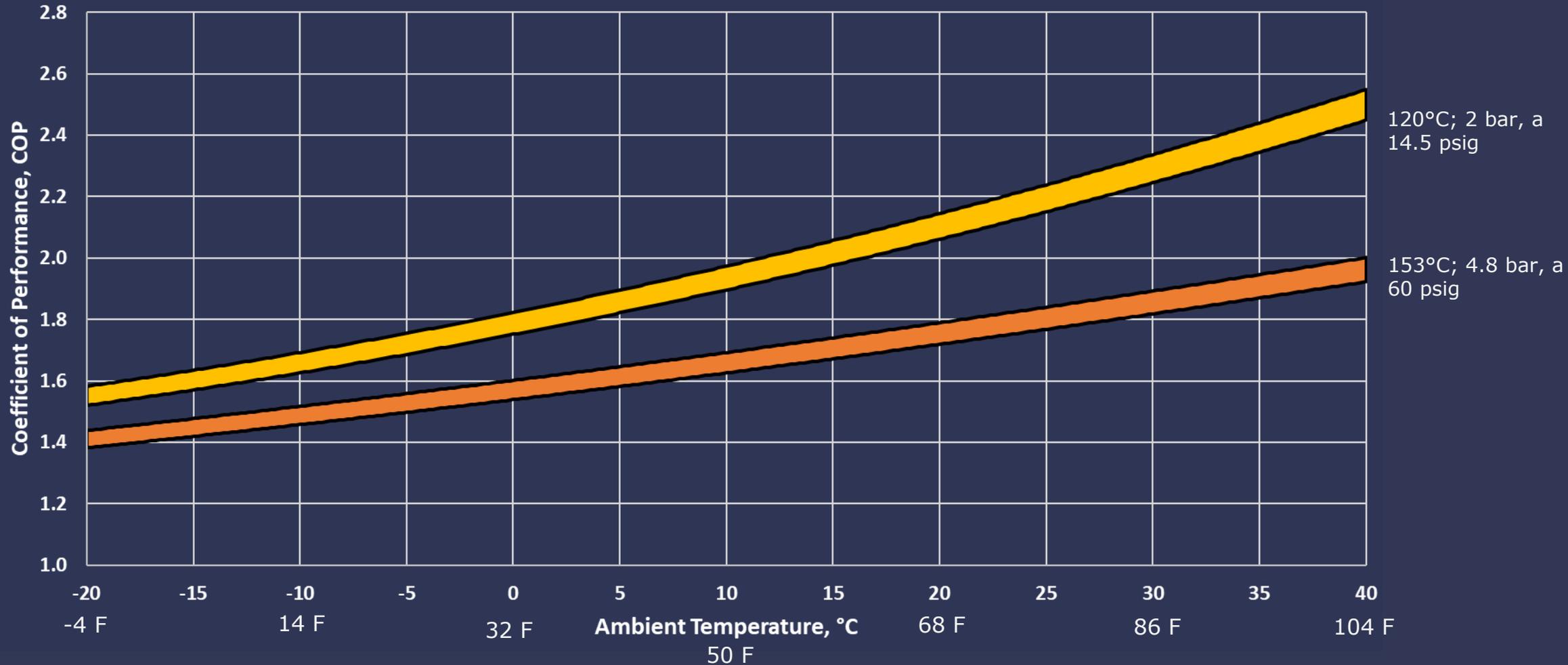
 **HP Dimensions**
Footprint: 8' x 27'
Height: 10' core

 **Refrigerant**
Ultra-Low GWP;
ASHRAE A1, or A2L options

 **Noise**
Sound pressure level 54 dB(A)
at 10m



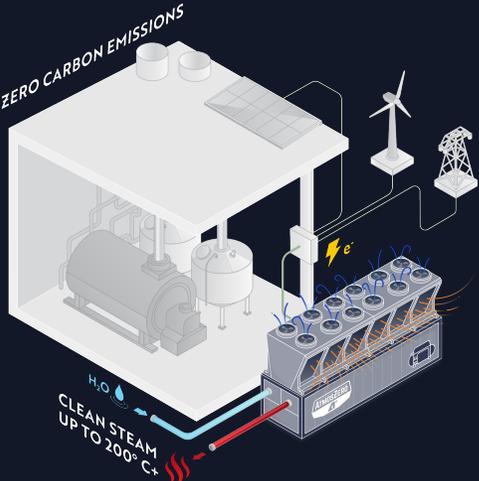
AtmosZero Air-Source to Steam Performance



Estimated performance, site-specific analysis required.

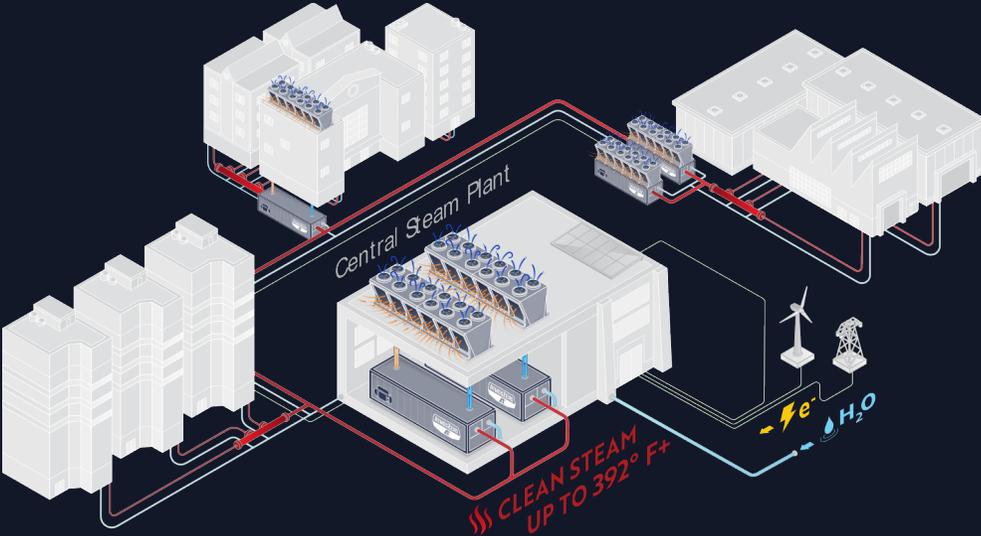
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Boiler 2.0 Installation Options



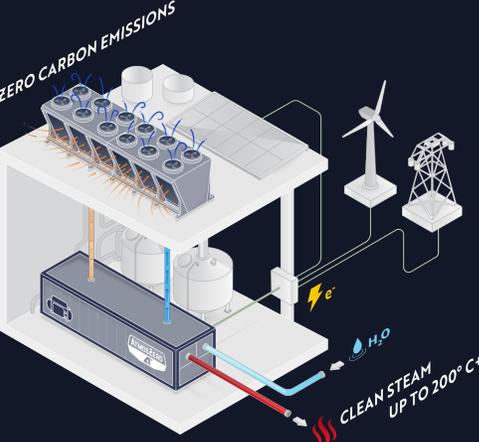
Outdoor Installation

Entire heat pump can be placed outdoors, with water & steam routed to/from the boiler room and steam headers.



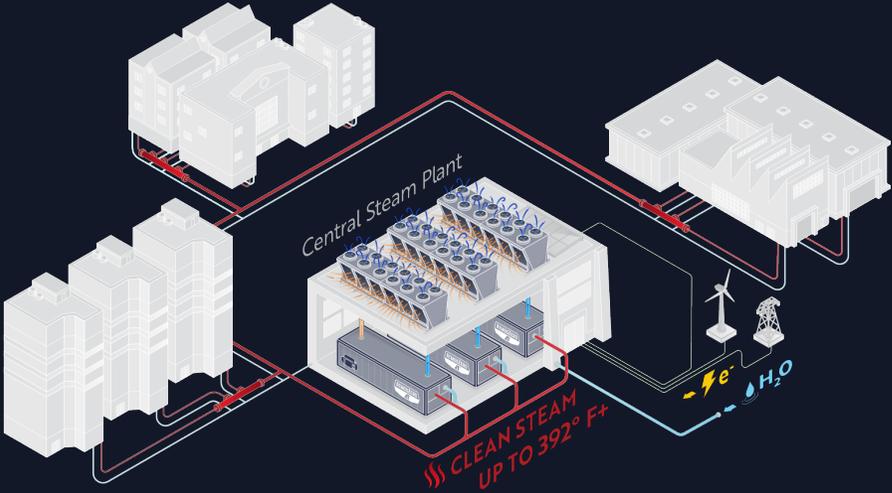
Distributed Steam Generation

The modular air-sourced heat pump can be deployed at various locations on-site, including at several different buildings on a campus.



Split Installation

Core heat pump can be placed indoors (e.g. in a boiler room or close to an end user) with air coils on a roof or other outdoor space. Glycol loop is used to couple the core heat pump and the air coils.



Central Steam Plant

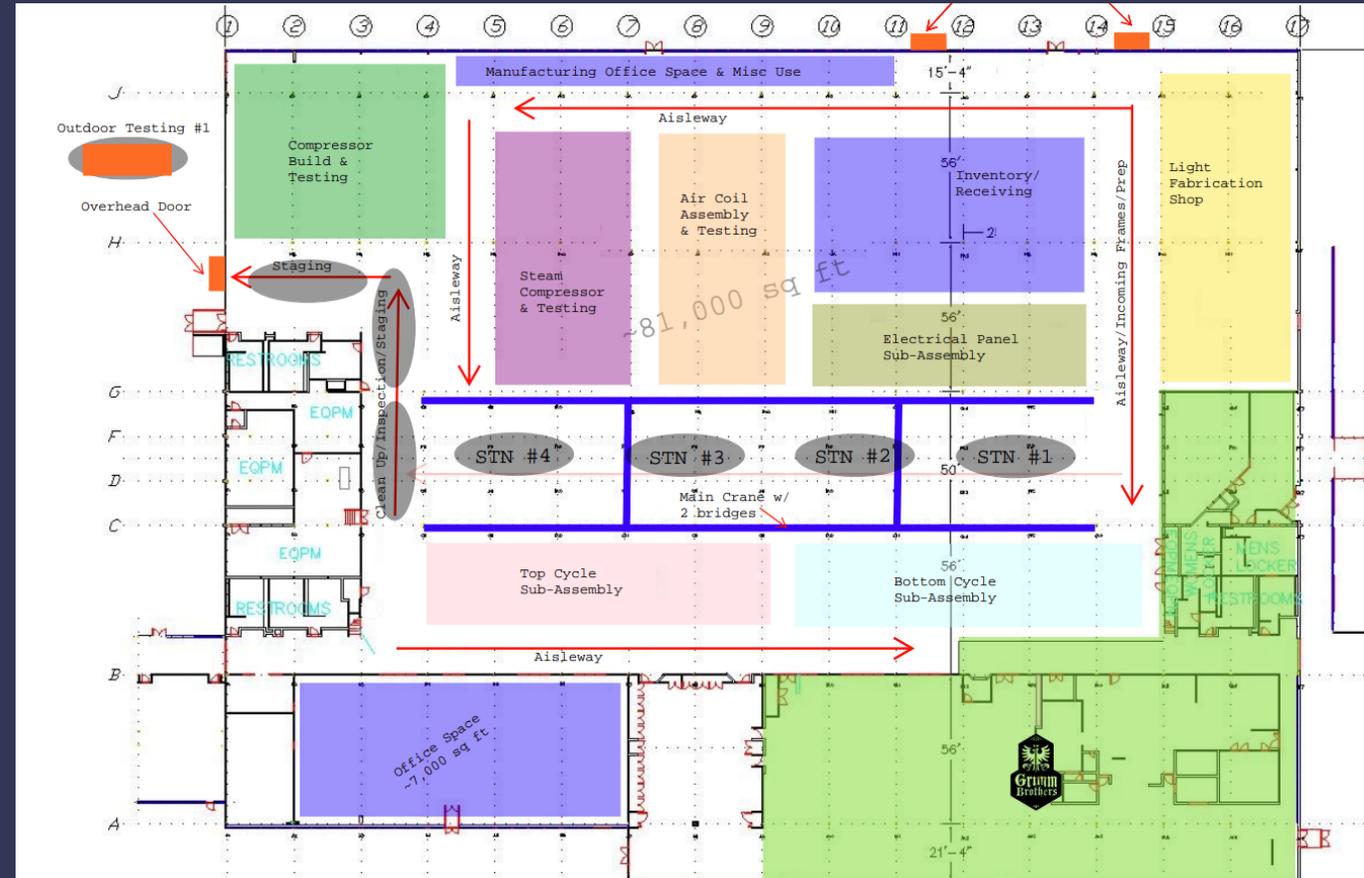
The heat pump can be installed in a central steam plant, similar to how existing natural gas boilers operate today.



Company Status - Manufacturing

- New Factory

- Loveland, CO
- Fabrication and Full Testing Capabilities
- Manufacturing site capable of 100s of units per year by 2028



Driving the next industrial revolution



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