

A Heat Pump & Steam

Towards CO2 neutral brewing

12th Industrial Heat pump conference

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Heineken an introduction

THE WORLD'S MOST INTERNATIONAL BREWER

- **Nº 1** IN EUROPE
- **Nº 2** IN THE WORLD
- BRANDS PRESENT IN **>170 COUNTRIES**
- COMPANY PRESENT IN **>70 COUNTRIES**



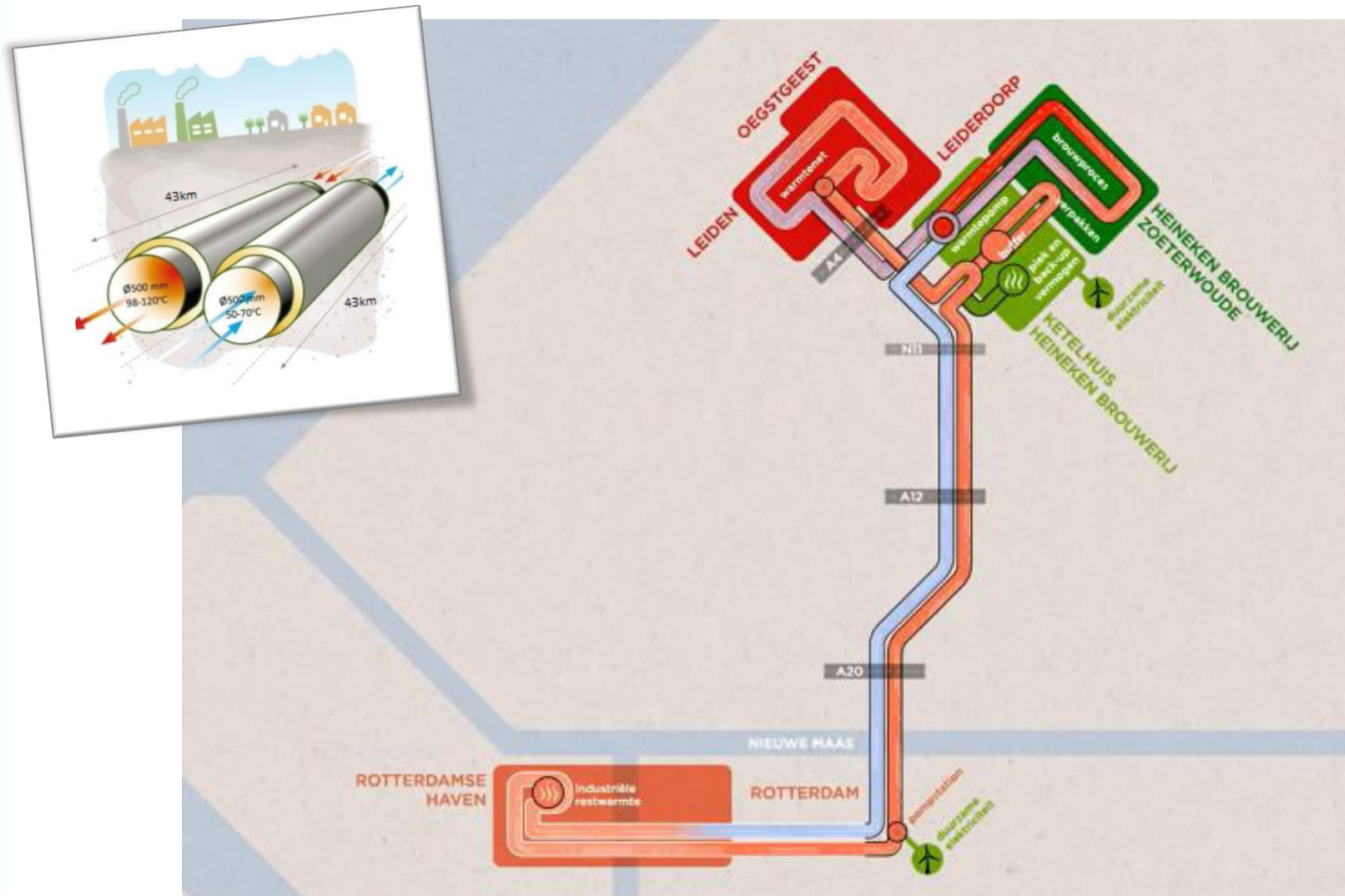
Heineken an introduction

ZOETERWOUDE

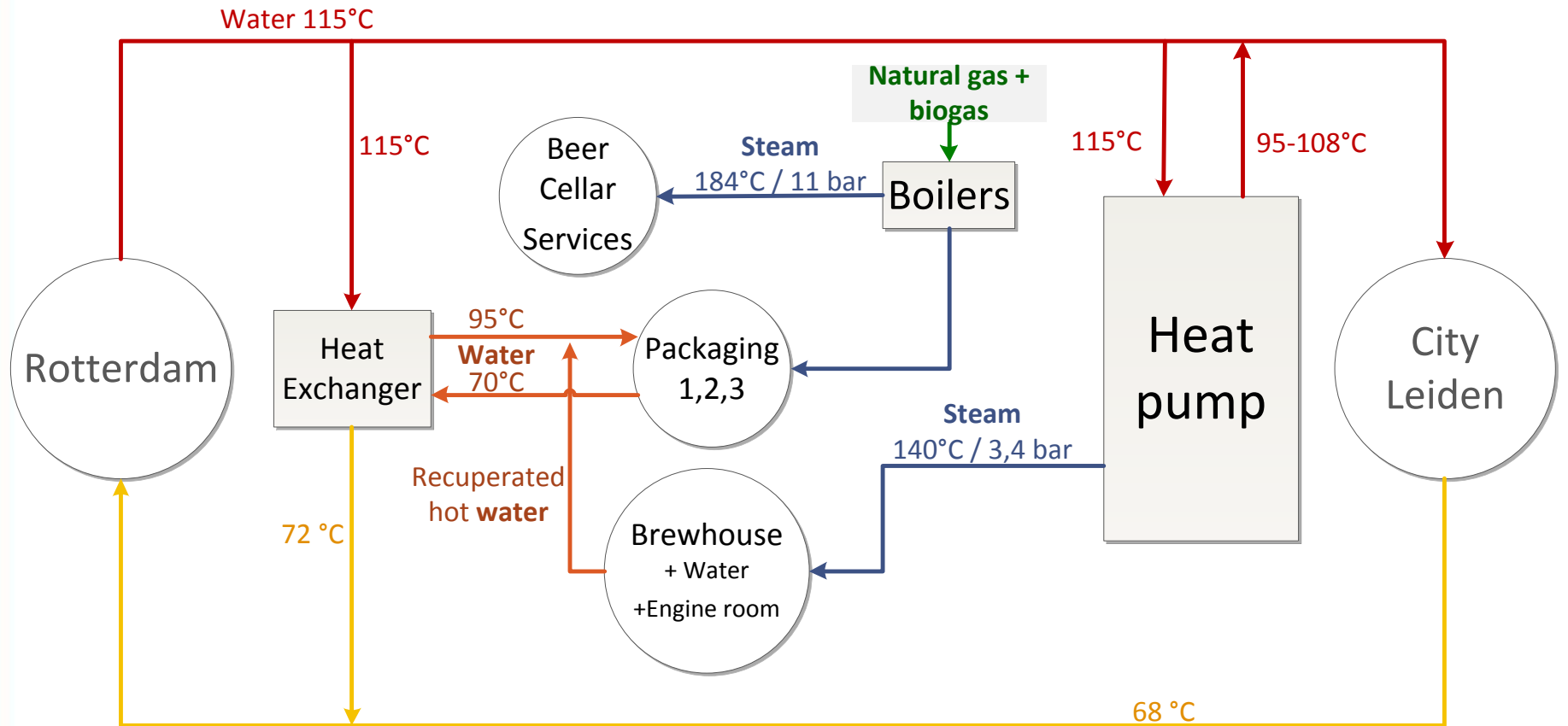
- Largest brewery in Europe
- Largest Heineken brewery



Envisioned Waste Heat Network



Flow Diagram



Heat Pump evaporator temperatures:

- 95°C at Summers peak
- 108°C in the depth of Winter

Project Data

Current average Heineken Heat Demand = **18 MW**

- **16 MW** from Natural Gas
- **2 MW** from Biogas

Current average City of Leiden Heat demand: **30 MW**

Available **Waste Heat** from Rotterdam Heineken and Leiden

- Hot water at **115 °C**
- Max. flow rate **1200 m³/hr** (0,34 m³/s)
- Capacity approx.. **60MW** (*depending on return temperature water*)

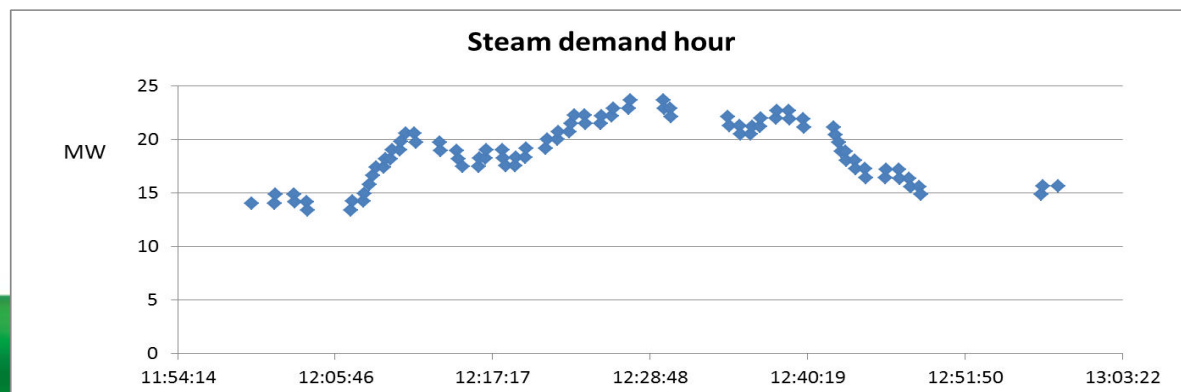
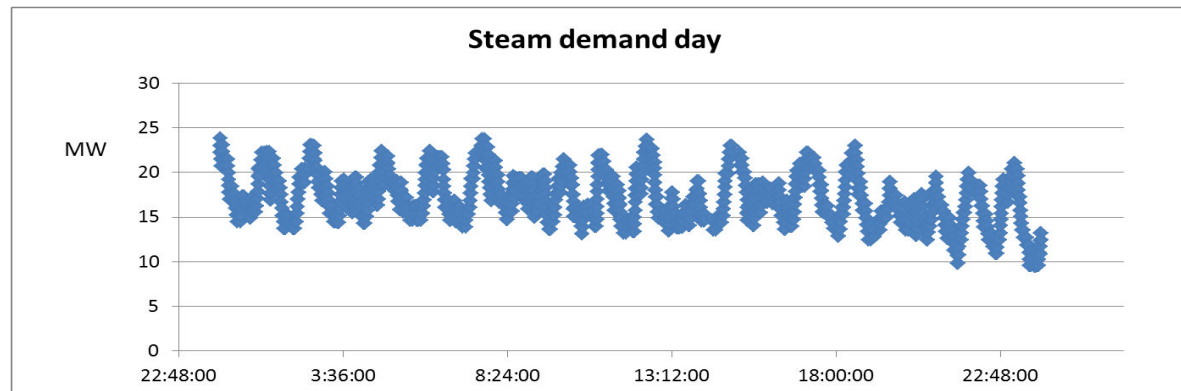
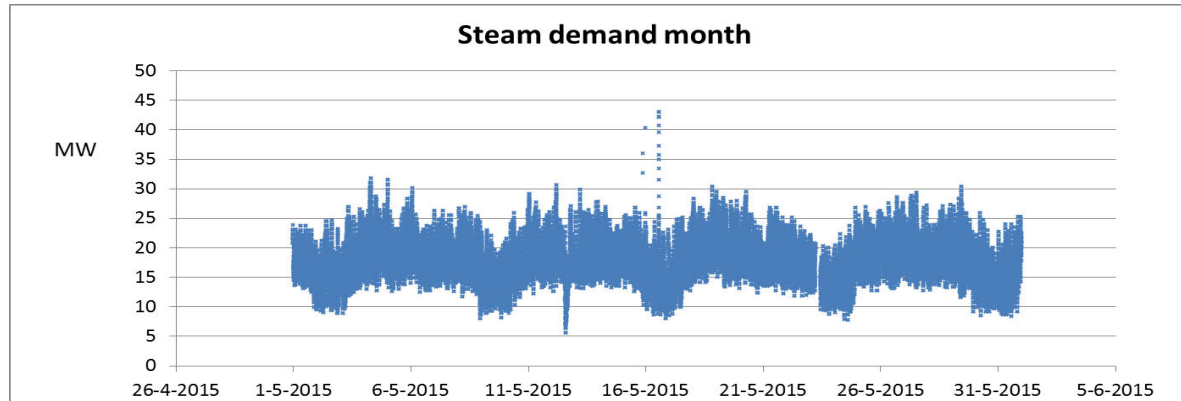
Envisioned **Heat pump + Hot water system** = **16 MW**

- **10 MW** steam at **140 °C** and **3,4 bar (abs.)**
- **6 MW** hot water at **95°C**

Max. Capacity of Heat Pump = **20–25 MW**

Electrical power to be optimized for the entire system **Rotterdam–Heineken–Leiden–Rotterdam** vice versa.

Current dynamics Steam Demand



We need you!

- Is it possible to produce **Steam** with a heat pump at **140 °C**?
 - Type of refrigerant?
 - Steam compression?
- How can we manage the **Highly Fluctuating** nature of our steam demand? *While operating the heat pump within the optimum performance window.*
- What do you expect from the **CoP** of this system?