A Heat Pump & Steam
Towards CO2 neutral brewing

12th Industrial Heat pump conference

Chris Versteegh
Senior Technologist
Heineken an introduction

THE WORLD’S MOST INTERNATIONAL BREWER
• № 1 IN EUROPE
• № 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. 60 MW (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

Steam demand month

Steam demand day

Steam demand hour
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?