



Business Case for
Natural Refrigerants

19-21/11/2018 – Lago di Garda

Germany's largest event- supermarket with CO₂ refrigeration technology

Nadine Neuberger

“

Customers won't come to us because they want to buy food. They want to be inspired by culinary delights and new experiences.

”

Marco Zurheide, Owner

The new food journey to Düsseldorf



Biggest event-supermarket in Germany

- 2,5 years project
- Opening 2018 March 22
- 12.000 sqm
- 2 floors
- More than 60.000 products



Many thousands of visitors are already inspired



- Invest ~20 Mio. €
- Monday to Saturday 8 am to 22 pm
 - customers per day 5.000
 - Turnover 50 Million €
 - 20 % out of gastronomy
- 200 employees
 - 50 % work in restaurants and food stations
 - 30 chefs

Thousands square meters of gourmet food

- Premium Beef Bar' - Live grilling
- Ham Bar
- Mozzarella Bar
- Vegetarian buffet restaurant
- Gourmet Restaurant
- Coffee Lounge
- Juice and Smoothie Bar
- Sushi Bar
- Champagne bar



Fresh goods from all over the world

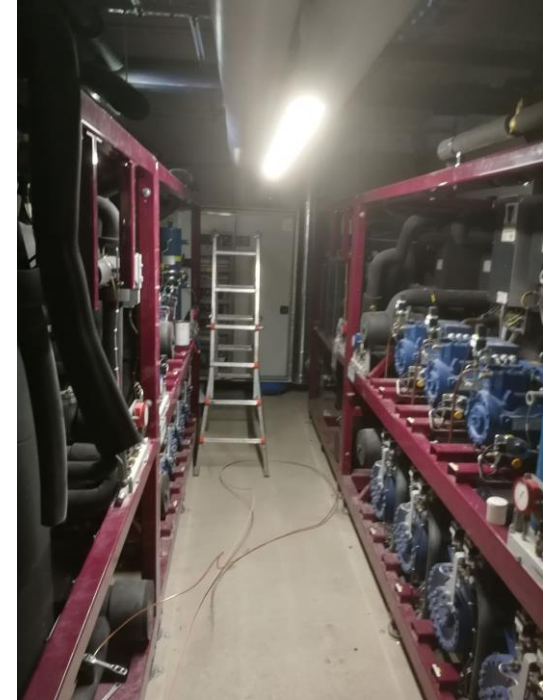
178 refrigerated points

- Cabinets, islands, counters
 - 350 m medium temp
 - 100 m low temp
- Cold rooms
 - 22 MT
 - 6 LT
- 5 icemaker (each 550 kg/h)



Installation

- 1.5 years planning
- 20,000 working hours
- 9.2 km copper pipe
- 42 km cable
- 1,500 kg refrigerant

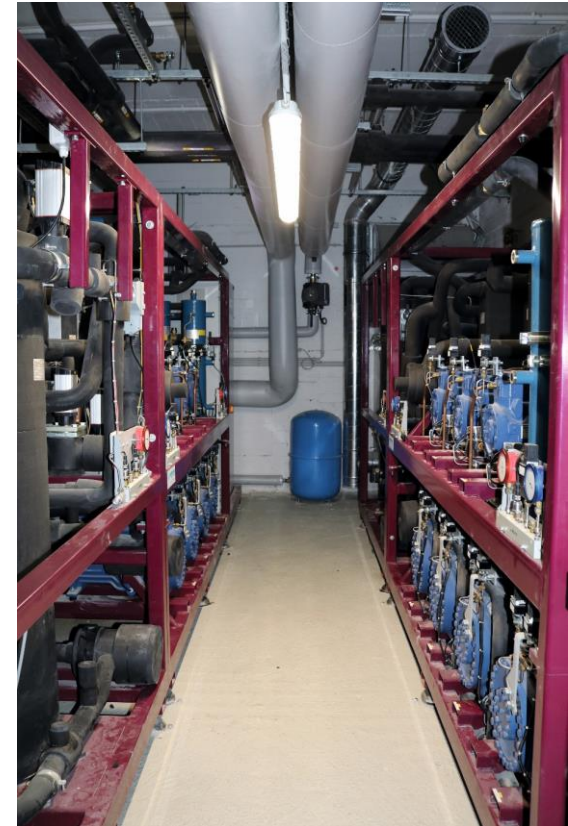


Refrigeration system

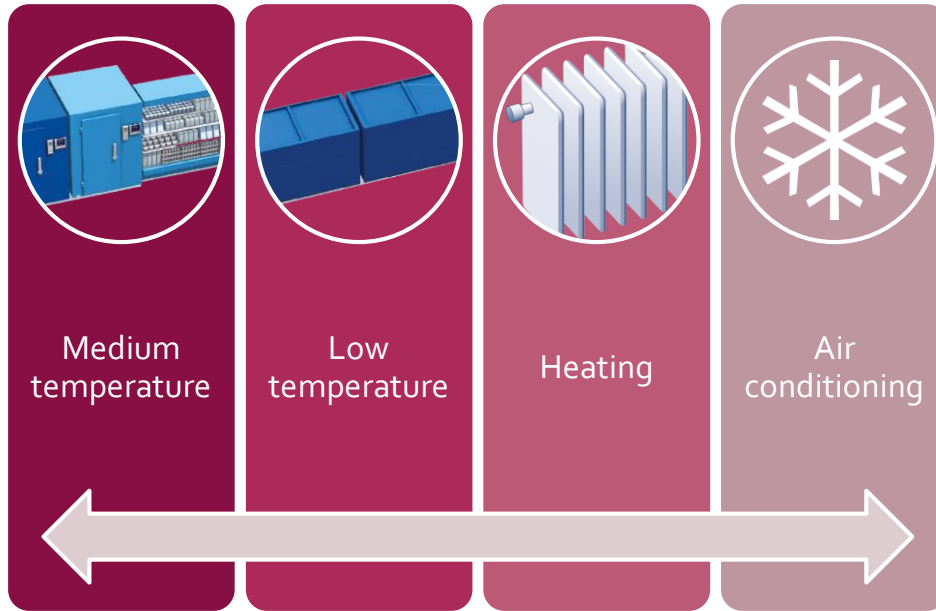


Refrigeration with CO₂ 2 x ROXSTA2.0

- Medium temperature
 - 140 kW (to -8 / t_{GCout} 36 °C)
 - 4 x compressors (first compressor incl. inverter)
- Low temperature
 - 33 kW (to -32 / t_c -8 °C)
 - 3 x compressors (first compressor incl. inverter)
- Parallel compression



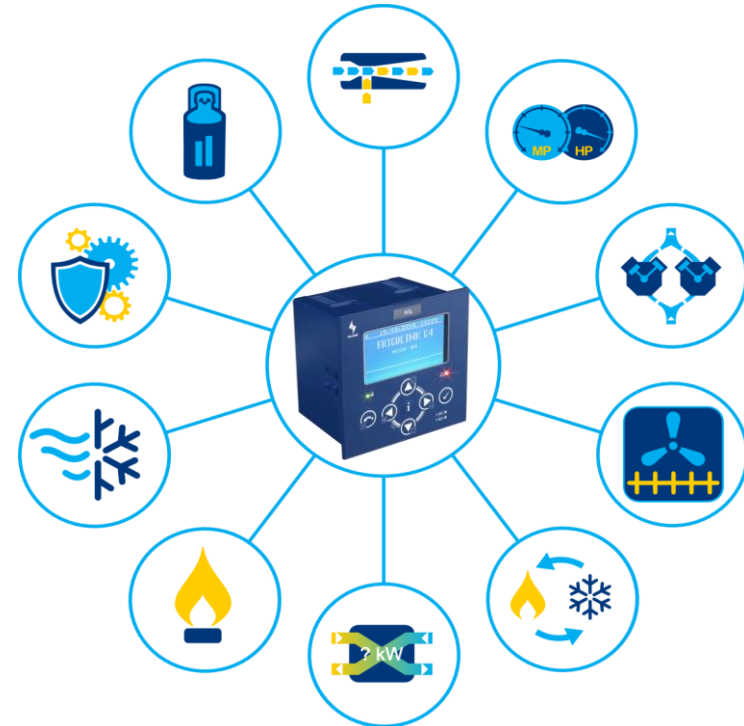
Refrigeration system



- Refrigeration 280 kW + 66 kW
- Heat recovery 270 kW
 - Completely used for space heating
 - Additional → District heating
- Air conditioning 180 kW
 - no separate air conditioning

Wurm-control system HCO₂-G₄:

- Rack Unit
- High and medium pressure
- Parallel compression
- Heat recovery
- Gas cooler bypass
- Gas cooler heat pump
- Air conditioning
- FRIDA-app



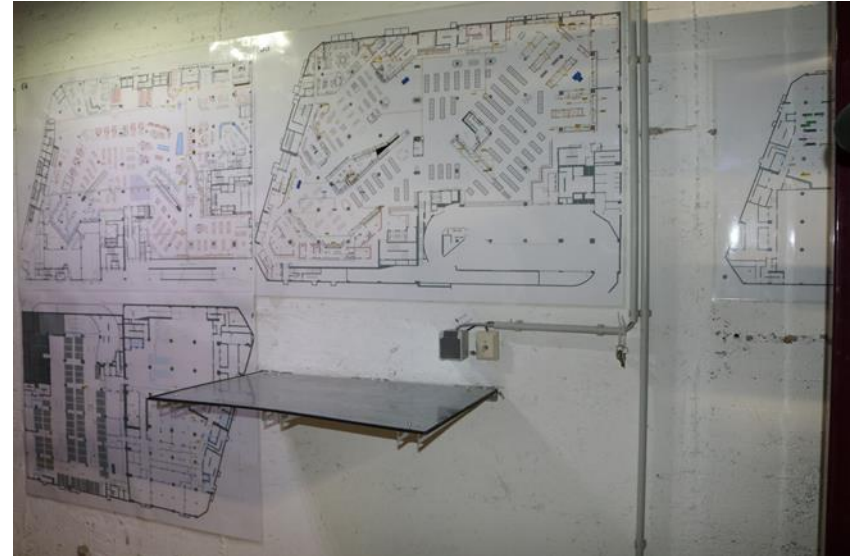
4 Gascoolers inside



- Over 20 m gascooler
- Should not be visible outside
- Indoor installation
- Supply air comes from underground car park over inlet grille

Safety concept

- Risk analysis already at building planning stage
- Set up in sections
- 41 Gas warning sensors
 - Indicate directly affected area in case of refrigerant leakage



Pipeline network

- 9,2 km copper pipe
- Low-noise and low-vibration laying
- Rubber-mounted by sound insulators on the concrete ceiling



Operational safety and efficiency

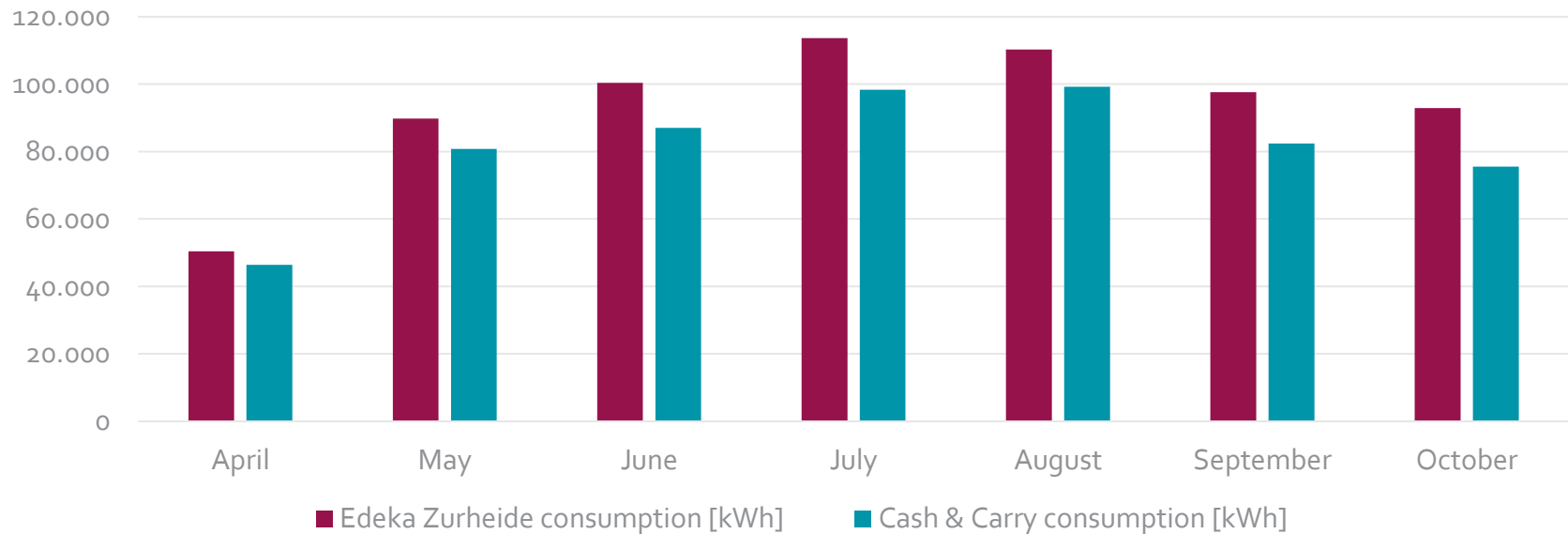
Operational safety

- Combined cooling on both ROXSTA
- 50 % backup
- Controlled suction gas superheater
- High value of goods

Efficiency

- Parallel compression
- Heat reclaim
- Strategic decision for a „simple“ system design

Energy consumption



Convince yourself





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