



Business Case for
Natural Refrigerants

25-27/09/17-Berlin

System solutions and experience

Food Retail Panel 27 September 2017

1917
2017

ICA
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år och
framåt!



ICA Group

- Operations in Sweden and the Baltics
- Core business is grocery retail
- 1300 mostly retailer owned stores in Sweden and 400 wholly owned stores in the Baltics. 385 pharmacies in Sweden
- Market share Sweden; 36 %
- Market share Baltics; 16%

Environmental climate targets:

Climate reduction 30% by 2020 (already reached)

→ **100%** reduction by 2020



ICA's solutions

Historical milestones;

- 1995 first store with 100% natural refrigerants
- Since year 1998 ; pumped CO2 for LT system, brine systems for MT and coolant for condenser side; →90% reduction in refrigerant charge
- 2002 first stores with subcritical CO2 (cascade systems)
- 2004 first store with transcritical CO2
- Since 2010; standard solution with transcritical CO2 systems
- 2013; Integrated AC in transcritical systems
- 2014; first store with transcritical CO2 and geothermal solution

Status 2017:

- Appr. 150 stores with 100% natural refrigerants in Sweden: I.E over 10% of stores
- 15 stores with integrated AC
- 6 stores with transcritical CO2 and geothermal solution and integrated AC
- Many renewals and energy projects with CO2 solutions

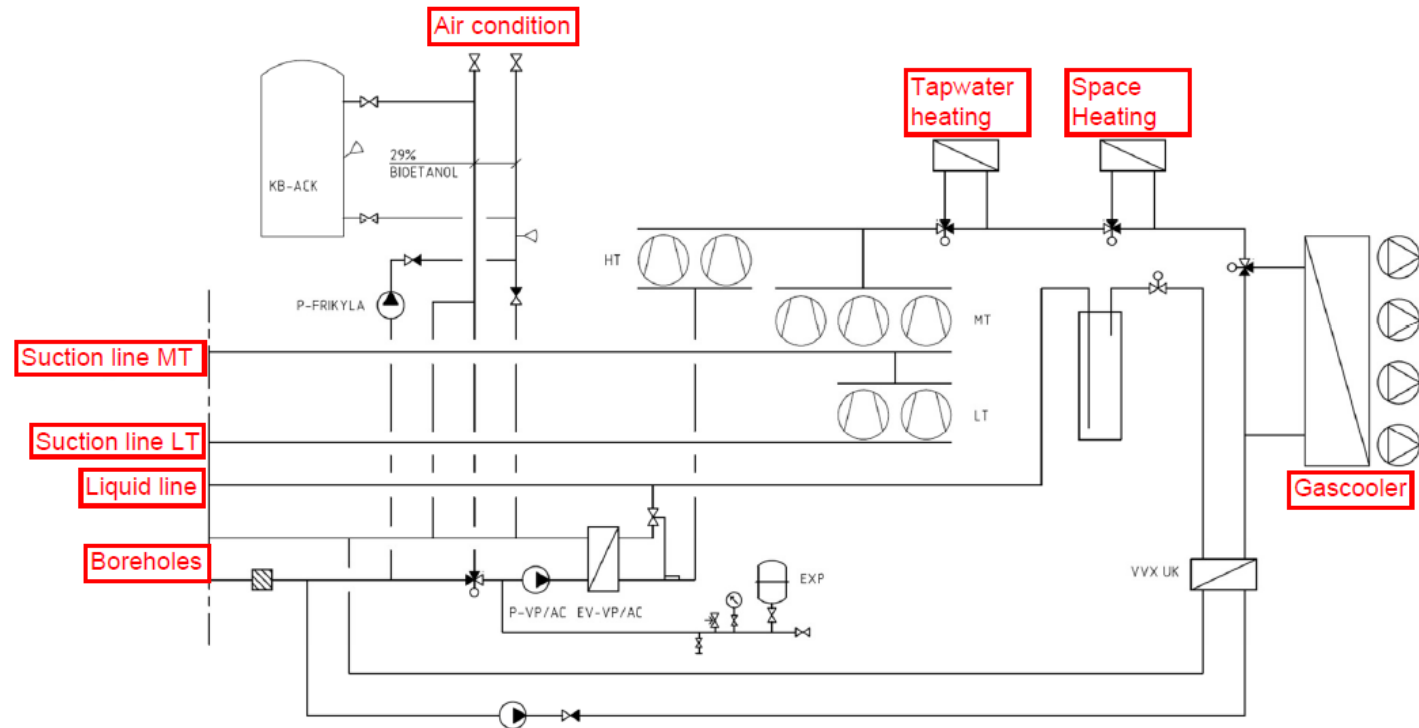
ICA's present solutions and experience

Status 2017:

- Systems have approx. 50% less energy use than standard HFC indirect systems (together with adding lids& doors)
- Systems have approx. 30% lower energy use than best reference HFC indirect solutions
- Geothermal with integrated AC-solutions; 10% higher COP on MT and up to 80% reduction in heating
- Liquid-Ejector systems; (1 store running, 1 store under construction); 10% energy reduction on MT-stage on yearly basis.

Altogether;

more than 50% energy reduction in all formats since 2009



CO2 Booster unit with MT / HT parallel compression and LT connected to geothermal system

ICA's recommendations

- System with integrated AC ; 100% natural refrigerants for real estate and opportunity to implement geothermal solution. Service and space efficiency.
- Participation in research programs
 - academics can use real installations for field measurements instead of only laboratory and gain knowledge and experience from contractors
 - independent evaluations of installations
 - spreads knowledge in the market – push the skill level

- With over 20 years of participation in national research programs thru Swedish Energy Agency where ICA has put over 30 stores at disposal

and

- Collaboration with the Swedish Refrigeration trade organisation

→ ICA actively breaks barriers to HFC free stores

Thanks



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