

WORLD LEADING CO₂ TECHNOLOGY

Market Overview : Commercial / retail refrigeration

Århus

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ADVANSORTM
by Hill PHOENIX

About ADVANSOR

- The Worlds largest producer of transcritical booster-systems
- Production of 8-12 systems per week
- Uses CO₂ to fight the global CO₂ problem (Global warming)
- Production area: 3000 m²
- Employees: 35 (+30 at sub contractors)
- Production 2010: 170 systems
- Production 2011: 230 systems
- Production capacity max. 500 systems per year
- Reference list: 700+ systems operating in 12 countries



Products and applications

CO2 refrigeration and heat pumps



Supermarket refrigeration compSUPER

1. Offer standard range
2. Also customized racks
3. High quality
4. Reliable – best in market
5. Easy to service
6. Energy optimization also for warmer climates
7. Heat recovery



Industrial/ warehouse compSUPER

1. Models is based on customized “compSUPER” range
2. Offers lower temperatures at higher efficiency
3. Best tech in 50-700 kW range



Ice Rinks compICE

1. ECO friendly systems for ice rinks for 1-3 ice sheets
2. Pumped CO2 benefits
3. 150-450 kW range
4. Best quality of ice
5. Energy savings



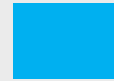
Convenience refrigeration compSUPER XXS condensing units

1. Single stage condensing units up to 12 kW MT
2. Double stage condensing units up to 16 kW LT
3. Low noise units for external installation



Industrial heat pumps compHEAT

1. Different technology, but based on same components
2. Offers higher supply temperatures up to 90°C
3. Higher efficiency

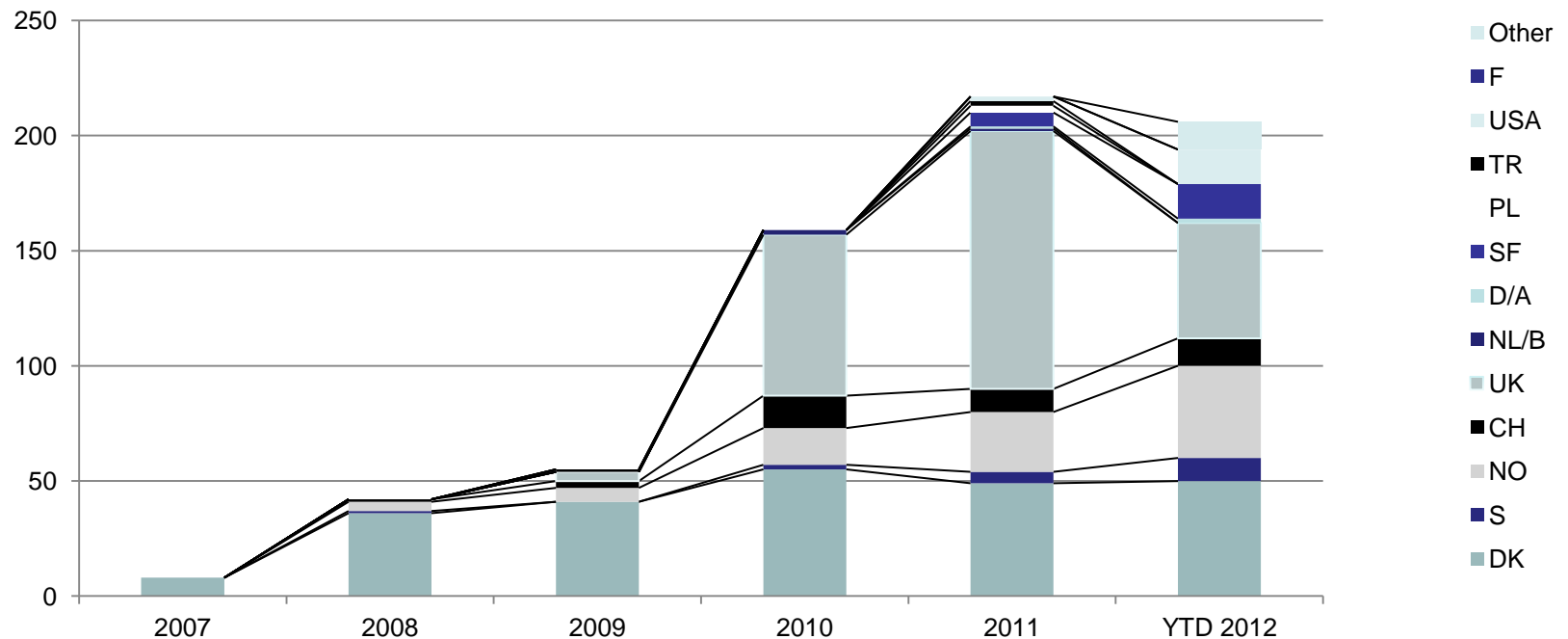


Air conditioning compFORT

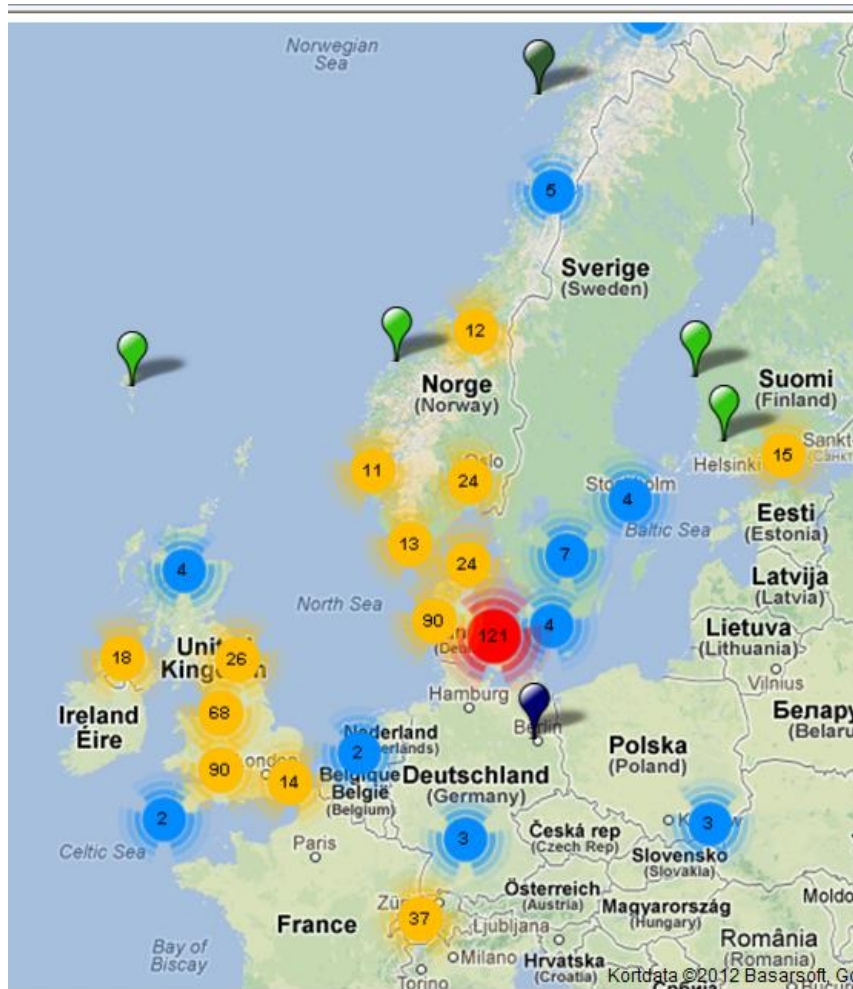
1. DX solutions saves energy and cost
2. Chillers also available

Annual installation volumes by country

Advansor transcritical CO2 booster



Geographical overview of European Impact



European Best Technology Map

- ↑ CO2 booster better than all other systems
CO2 booster 5-10% better than DX HFC
- ↑ CO2 booster better than indirect HFC
CO2 booster equal with DX HFC and cascade
- ↓ CO2 3rd generation
- ↓ Cascade system



Lessons learned from 20 years with natural refrigerants

- **Natural refrigeration solutions exist for the European retail industry**
 - Do not wait until tomorrow with the things we can do today
- **The end users and their customers can afford to make the transition**
 - Converging cost : present figures indicate 5-10% premium cost on the total installation
 - Evidence : Roll out in countries with no legislation
 - Lowest specific cost of Carbon Footprint reduction (€/ton) derives from HFC phase out!!
- **Safety and reliability levels the conventional technology**
 - Empirical evidence
- **Challenges for Europe**
 - Education of Installers and Service Providers
 - smooth transtion schemes rather than full stop regulations
- **Adress to policy makers**
 - Low GWP refrigerants are no long term solutions
 - The charge (kg) of systems is as relevant as the GWP value
 - Introduce immediate ramp down schemes to allow education
 - The industry will not volunteer – strong rules required