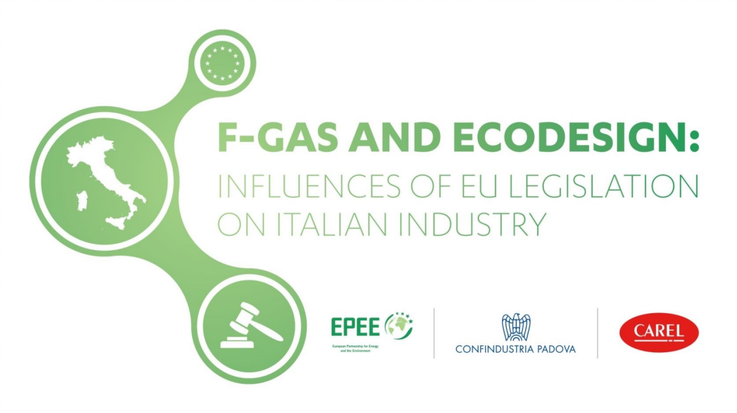
F-GAS AND ECODESIGN:

INFLUENCES OF EU LEGISLATION ON ITALIAN INDUSTRY

EPEE
European Partnership for Energy and the Environment

CONFINDUSTRIA PADOVA

CAREL



Practical solutions to address F-gas challenges

Alvise Case

Francesco Mastrapasqua

«The preferred local partner for customized products and refrigeration system solutions.

The ultimate technology and design for the unique store.»

- Specific concept cases
- Power Racks
- Cold Rooms
- Installation
- Service & Maintenance
- Project Management
- Professional Training
- Retrofitting
- Energy Management

COSTAN | Bonnet Névé | GEORGE BARKER | eurocryor | misa | iarp

Global Partner in the commercial refrigeration & food and beverage sector


LIMANA


SOLESINO


POMEZIA


CASALE MONFERRATO


HENDAYE


ST.QUENTIN FAL.


BRADFORD


ROSARIO


QINGDAO


CORLU


CHA-AM

1. Turnover — 680 M€

2. Personnel — 4.000 people

3. R&D Investments — 1,5% of the turnover

COSTAN | Bonnet Névé | GEORGE BARKER | eurocryor | misa | iarp

Green products, made in green factories

Self powered, controlled emissions, heat recovery, lean manufacturing

Frame assembly

HFC/HFO

Warehouse

CO2

Quality

Clima

Test

Chillers

Pruduction area	5000 sqm
Production CO2	400/year
Personnel	70 heads
Systems in operation	1000+

Refrigeration Systems CO_2 Product range

- Efficiency
- Integration with HVAC
- Flexibility
- Technical room lack of space
- Easy installation and maintenance

- Cost optimisation
- Robust and safe construction
- Building management optimization
- Integration with HVAC

CO2 Professional training for contractors and users

Refrigeration Systems CO_2 Product range

EPTABLUE 2.0 WATERLOOP

ECO_2 Small

EPTACLIMA

ECO_2 Large

E+E Epta Educational

Convenience / Supermarket
Hard Discounts

ECO2 Small

- Variable speed drive MT/LT
- Electrical control board
- High Temp version
- Heating mode
- Indoor / Outdoor
- Emergency back up

Distinctive features

- Extremely compact design
- Regulation optimized at factory
- Weather resistant
- Easy access for maintenance
- Robust and safe construction
- Efficient

Supermarket / Hypermarket

ECO$_2$ Large

- Variable speed drive MT/LT
- Electrical control board
- High Temp version
- Heating mode
- Hot water sanitary
- Indoor / Outdoor

Distinctive features

Supermarket / Hypermarket

EPTACLIMA

Combine your heating and refrigeration systems to optimize the energy consumption of your store.

NEW PRODUCT

Heating + A/C

Indoor / Outdoor

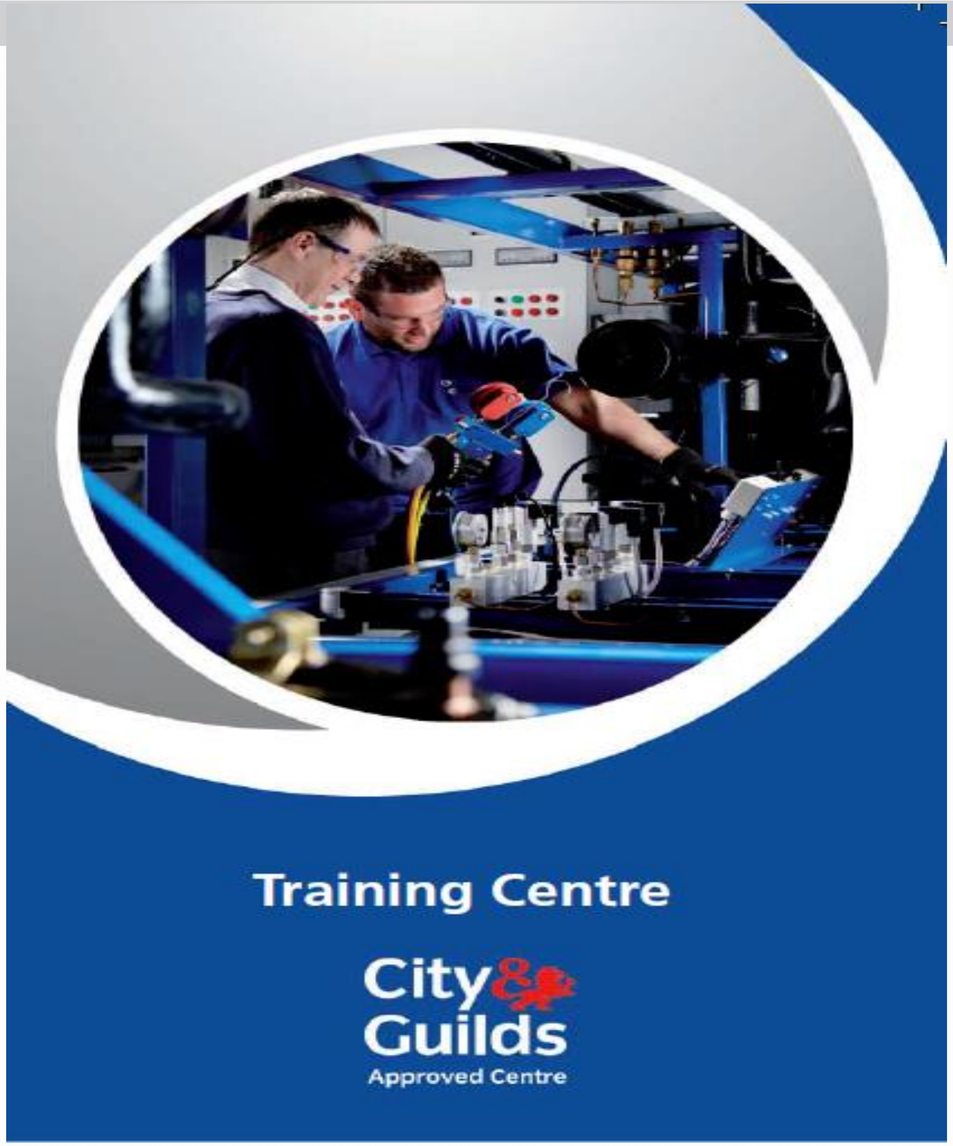
Energy management

The perfect management of the store capital cost
It balances capital investment, energy efficiency and technological innovation

EPTACLIMA combines the refrigeration and comfort needs of a store with simplicity

Simple, complete, economical and practical

« In EPTA we are deeply convinced that the main axes of development to ensure environmentally sustainable systems stable growth in the future is knowledge management. »



HISTORY

The Epta training centre was completed in 2009 and was designed for training staff from throughout the Epta group and later expanded to train engineers from throughout the industry.
The primary focus was on the widespread adoption of CO2 as a refrigerant and the necessary skills that this required passing on to the workforce.

A full complement of CO2 systems are available for training and research:-

Cascade system – a two compressor cascade system featuring Bitzer compressors and standby cooling together with inverter control.

Transcritical Booster system – A multi compressor system comprising MT and LT booster compressors. The system is configured to utilise multiple transcritical and flash gas solutions. The plant is equipped with inverters and standby cooling.

Pumped system – featuring the latest Grundfos hermetic refrigerant pump, and multiple regulation valve options.

In 2010 the centre was accepted as a City & Guilds approved training provider and expanded its operation into conventional refrigeration technology.

STAFF

The centre is manned by two City and Guilds approved assessors and a number of tutors who can deliver the courses in a multitude of languages.

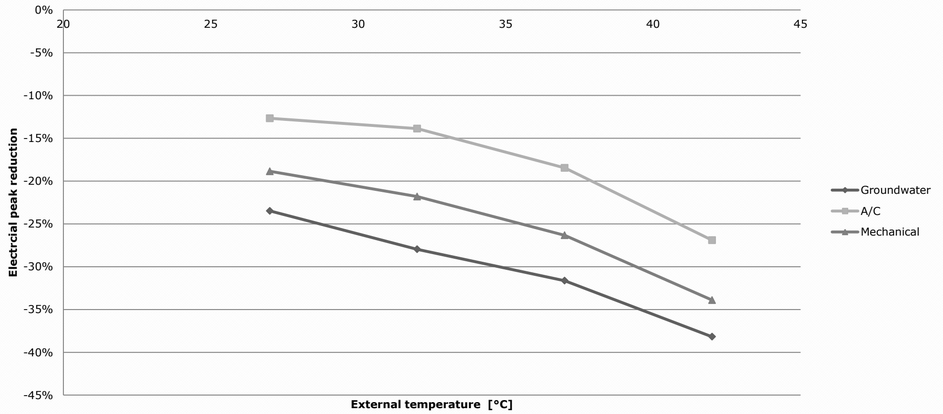
All the staff working within the centre have many years of experience working with CO2 systems around the world.

Administration staff also provide additional support and can assist with booking queries and special requests.

We have a commitment to our Clients for quality and simplicity: EPTA always offers Equipment&Training together

Super and Hypermarket: mechanical sub-cooling

- Several techniques are available to expand the convenient use of CO_2 in warm climate regions
- Our experience from different stores in Southern Europe, South America and Australia show it is possible to achieve outstanding efficiency levels without cost or safety compromises
- With ambient temperature high exceeding the +35°C, even +50°C as in the case of the Australian plant, subcooling technology is a viable solution
- The reduction of the pressure is responsible also for the reduction in the energy peak and, as consequence, in the energy consumption



Store	U.M.	South Europe	South Europe	Australia	Australia
Store size	[kW]	95	102	85	80
Sub-cooling method	[-]	No sub-cooling	Groundwater	A/C	Dedicate Chiller
Sub-cooling power	[kW]	-	37	35	14

Supermarket, Reggio Emilia

- Opening date: 2015, July 28th
- Surface: 1,000 sqm
- Refrigerant: MT/LT CO2 booster – 70 kW MT net + 7 kW LT
- Provider: COSTAN
- Mechanical sub-cooler (water chiller) to improve cycle efficiency

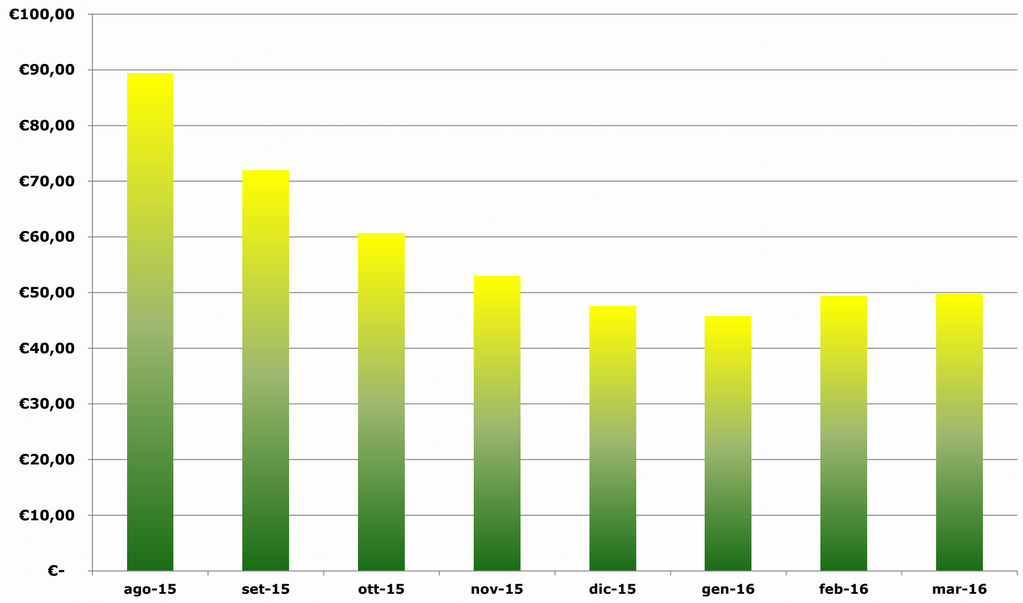
Monthly total electrical consumption

€ 1.776

Monthly refrigeration electrical consumption

€ 1.203

Energy consumption



Consum supermarket, Paterna (Valencia)

- Opening date: 2016, February 25th
- Surface: 1,500 sqm
- Refrigerant: MT/LT CO2 booster – 80 kW MT net + 20 kW LT
- Provider: EPTA IBERIA
- Mechanical sub-cooler (water chiller) to improve cycle efficiency
- Sanitary water 100% heat reclaim

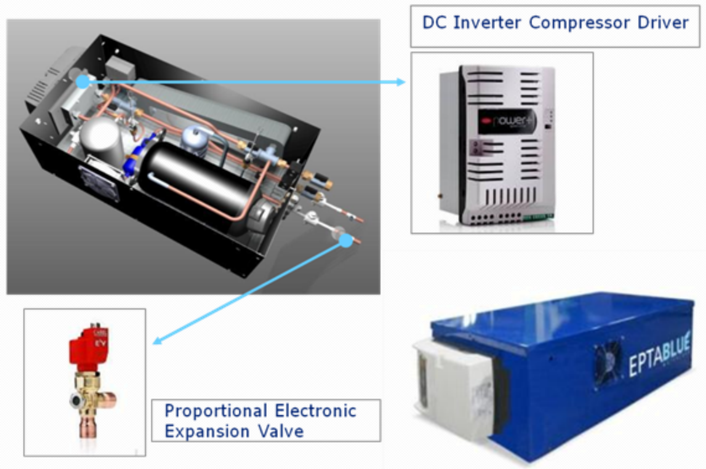
ECO2 Large

Morris Fresh IGA, Innaloo (Perth)

- Opening date: April 2015
- Surface: 1,400 sqm
- Refrigerant: MT/LT CO_2 booster – 80 kW MT net + 20 kW LT
- Provider: AJ BAKER PTY LTD (EPTA official distributor)
- Power costs are up to 25% less than similar sized CO_2 / R134a installation.
- TEWI -55% (saving of over 4,400 tonnes CO_2-e) vs CO2 / R134a

ECO2 Small

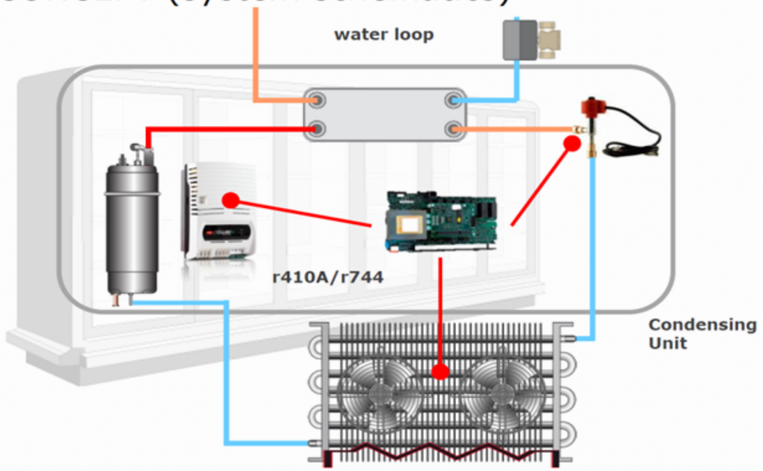
EPTABLUE 2.0 Freecooling



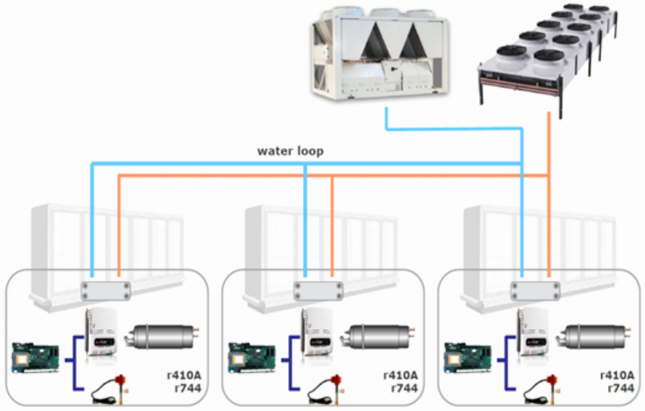
STORE LAYOUT
Simple, economical and practical

- ✓ Single loop for MT/LT
- ✓ No subcooling chiller
- ✓ No technical room nor installation work
- ✓ No perceptible noise
- ✓ No equipment outdoor
- ✓ Warm climate version and new extended limits
- ✓ Freezing protected up to -25°C (glycol)

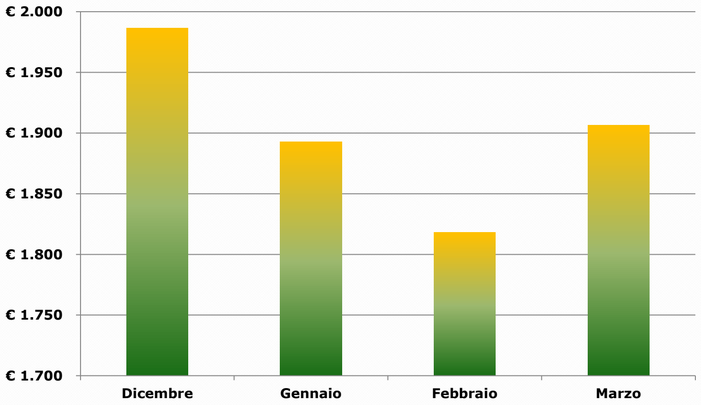
CONCEPT (system schematics)



CONCEPT (system schematics)



EPTABLUE - Parma



Monthly consumption

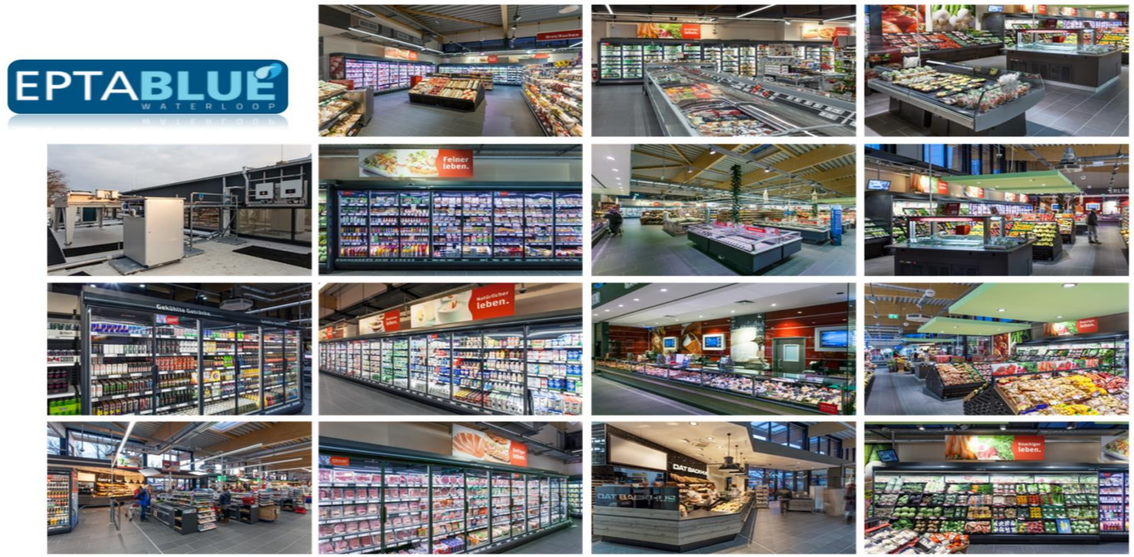
~ 1.900 €

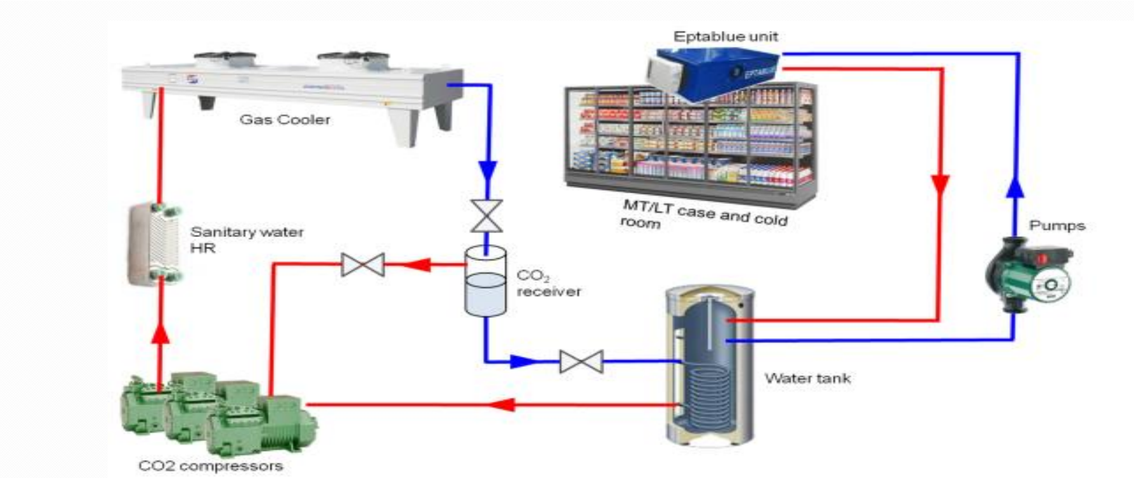
Annual consumption

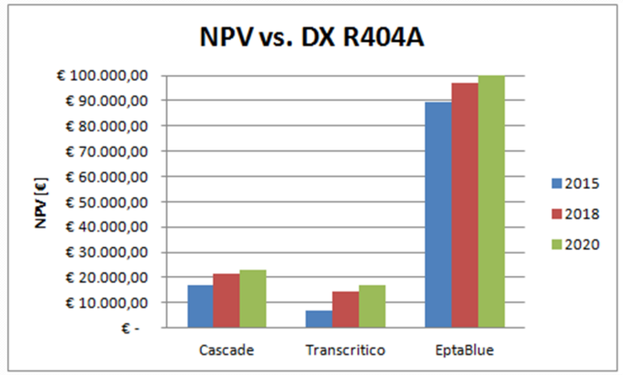
~ 24.000 €

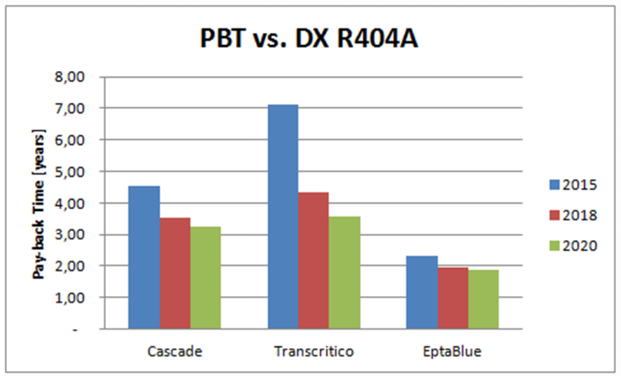
- Opening date: 2015, December 8th
- Surface: 1,000 sqm
- Cabinets: 74 kW MT + 8 kW LT
- Provider: COSTAN
- Mechanical water chiller for LT and free cooling for MT

EPTABLUE 2.0 Advanced









CONSUMO ENERGETICO	DX R404A	Cascade R134a/CO2	CO2 Transcritical	EptaBlue
Consumo centrali	164,2	151,0	159,1	113,0
TOTALE	164,2	151,0	159,1	113,0
		-8,0%	-3,1%	-31,2%
Totale annuo	€ 27.907,20	€ 25.661,50	€ 27.050,40	€ 19.201,50
Saving	€ -	-€ 2.245,70	-€ 856,80	-€ 8.705,70

SUSTAINABLE SYSTEMS

40 kW

2020 GWP_{MAX} 2500

2022 GWP_{MAX} 150

EPTABLUE 2.0 WATERLOOP

NATURAL

LOW GWP REFRIGERANTS &

ECO$_2$ Small

EPTACLIMA

ECO$_2$ Large

LOW GWP REFRIGERANTS

Rest of the world

Outlook on future trends

- In 2015 more than 40% of delivered systems in Europe are CO_2 based
- F-Gas has contributed to raise attention to the responsible choice of technologies and refrigerants, but support and training proved to be essential in this process
- Capillary, efficient and skilled technical back-up are the key to reach new markets
- Competence management is the essential asset to better serve our clients
- A one-size-fits-all product offer can’t adequately or profitably achieve the customer expectations, therefore the industry is required to diversify its technological palette
- Waterloop systems show an outstanding TCO profile and represent an innovative perspective to natural refrigeration
- R+HVAC building integrated systems are the key to convey all energy needs into one NR technological platform that will in future ensure new expansion for NR