

green.freshness.worldwide

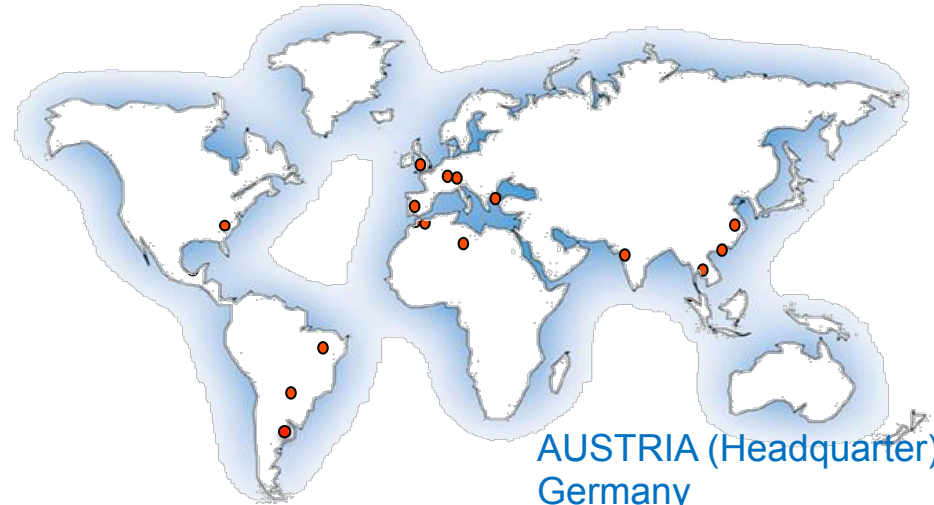


Natural refrigerants for commercial freezers

Practical experience

Paris, 17.07.2014

Guillaume GROLIER
AHT Cooling Systems France, GM



- AUSTRIA (Headquarter)
- Germany
- France
- Italy
- Great Britain
- USA
- Turkey
- Hong Kong
- China
- Spain
- Brazil
- Mexico
- India

Factories in Austria, China and Brazil



Quality management

according ISO 9001:2008

Environment management

according ISO 14001:2004

Safety & Health management

according OHSAS 18001

Social accountability

according SA 8000





Ice cream cabinets

since 2004
with R290



Bottle cooling

Available
with R 290



AC W



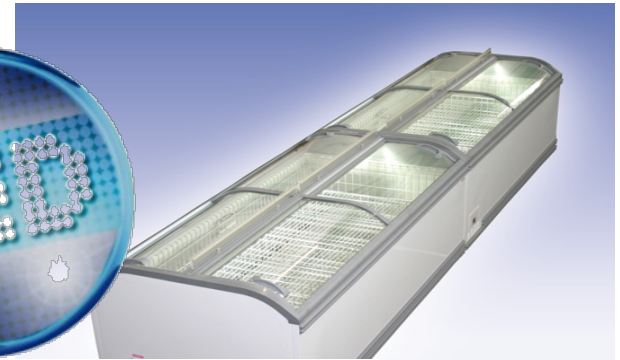
AC S



AC M



Athen XL



Manhattan

Supermarket



Miami **ECO**

NEW



Sydney **ECO**

R 290



Salzburg



Paris



France



Denmark

We already did it!

AHT's cabinets supplied with R290
670.000 worldwide
3.000 Thailand
550.000 in Europe's supermarkets



Sweden

Key features in general

- stand-alone cabinets or banked together in an isle
 - environmental friendly
 - low energy consumption
 - blowing agent for insulation: Pentane
 - **future proof technology**
 - natural refrigerant
 - variable speed compressor
 - connectable to store management systems
 - for small, medium and big supermarkets suitable
- ✓ **available now**

Key features in Europe

- Hydrocarbon installations started in 2006
 - ECO and LED version since 2011
- numbers of cabinets increasing by 70.000 units each year
- in average 28 units per store

Store information / feed back

- significant savings due to reduced energy consumption
- product temperature -18° to -22° (@ 25°C ; 60%)
- very low failure-rate and no regular maintenance
- used in many stores without AC
- **future proof** due to natural refrigerants (R290)



Bottle cooler R290 VS R404A

AC-S

Dimensions

- B x H x T 706 x 1495 x 766
- net content 190 Liter

Refrigeration system

- forced air, full hermetic
- refrigerant R290 140 g
- classification... M2

Energy

- Energy consumption 10,6 kWh/24h



R 290

Bottle cooler R290 VS R404A

AC-M

Dimensions

- B x H x T 716 x 1973 x 771
- net content 324 Liter

Refrigeration system

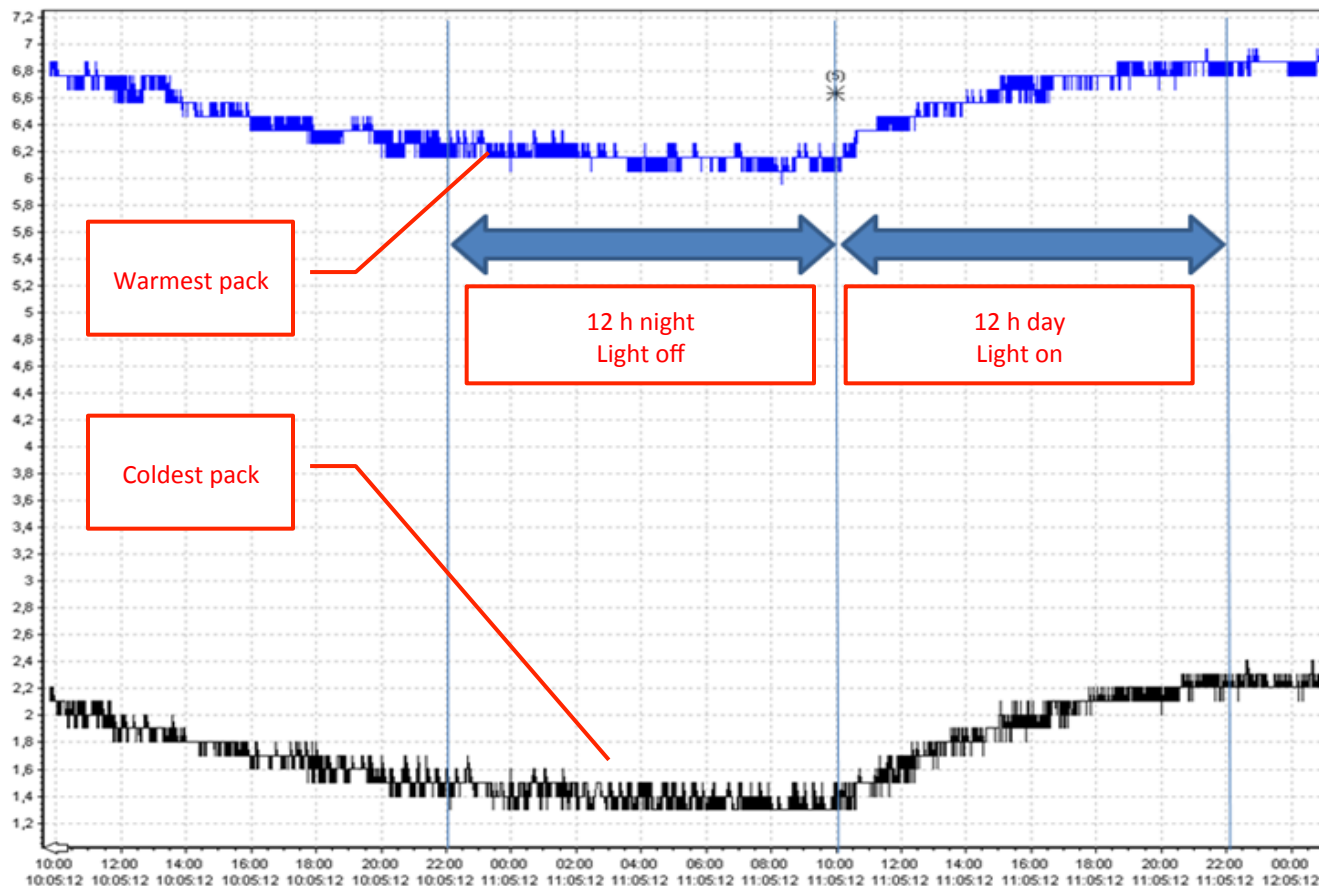
- forced air, full hermetic
- refrigerant R290 150 g
- classification ... M2

Energy

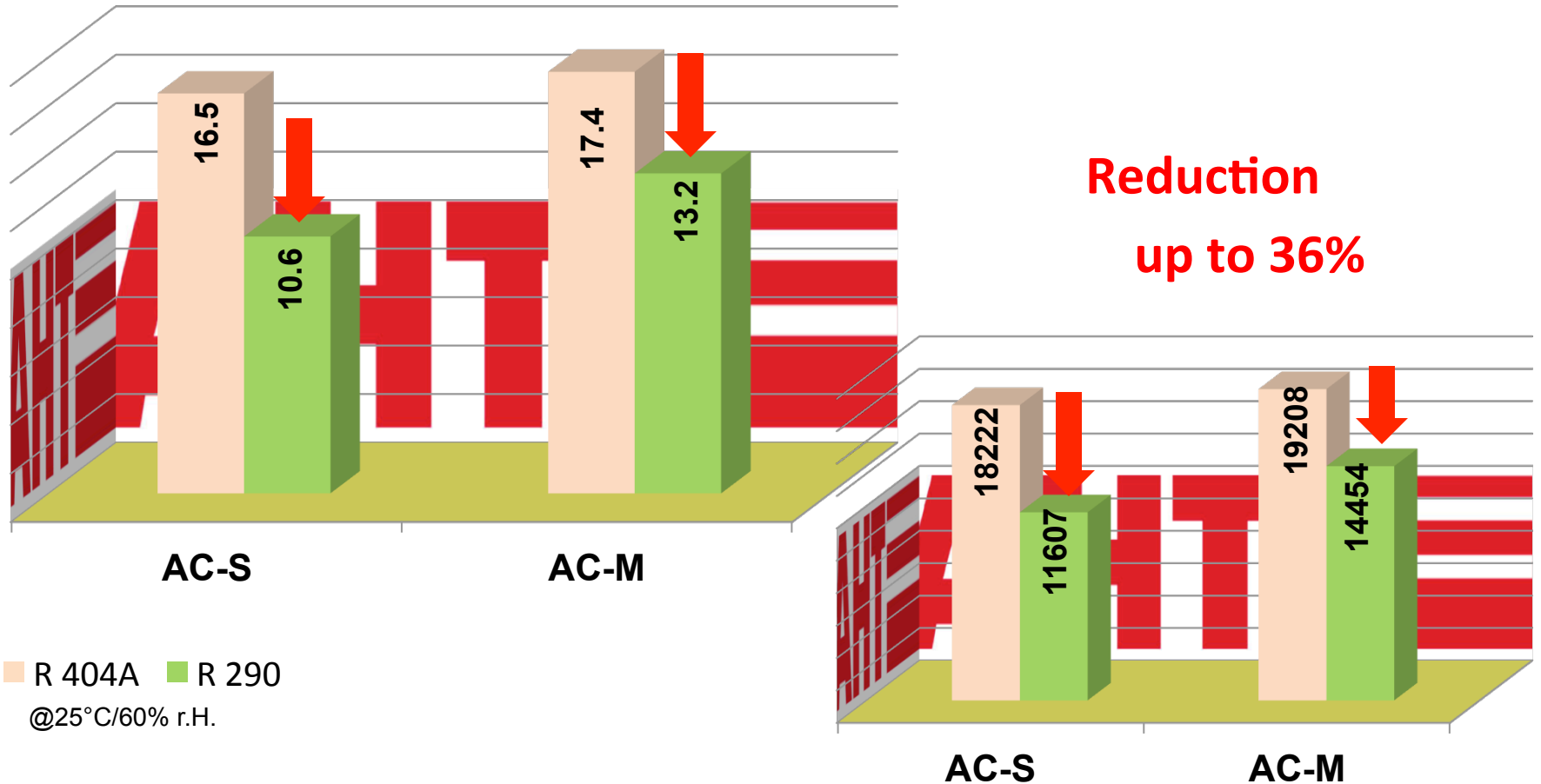
- Energy consumption 13,4 kWh/24h



Temperature performance AC-S



Comparison of energy consumption and TEWI



TEWI = total equivalent of warming impact

- **TEWI – influences**

- direct influences

TEWI =

Natural refrigerants

$$\left(\frac{CWF}{GWP} \times L \times n \right) + \left(\frac{CWF}{GWP} \times n \times (\alpha + \beta) \right) +$$

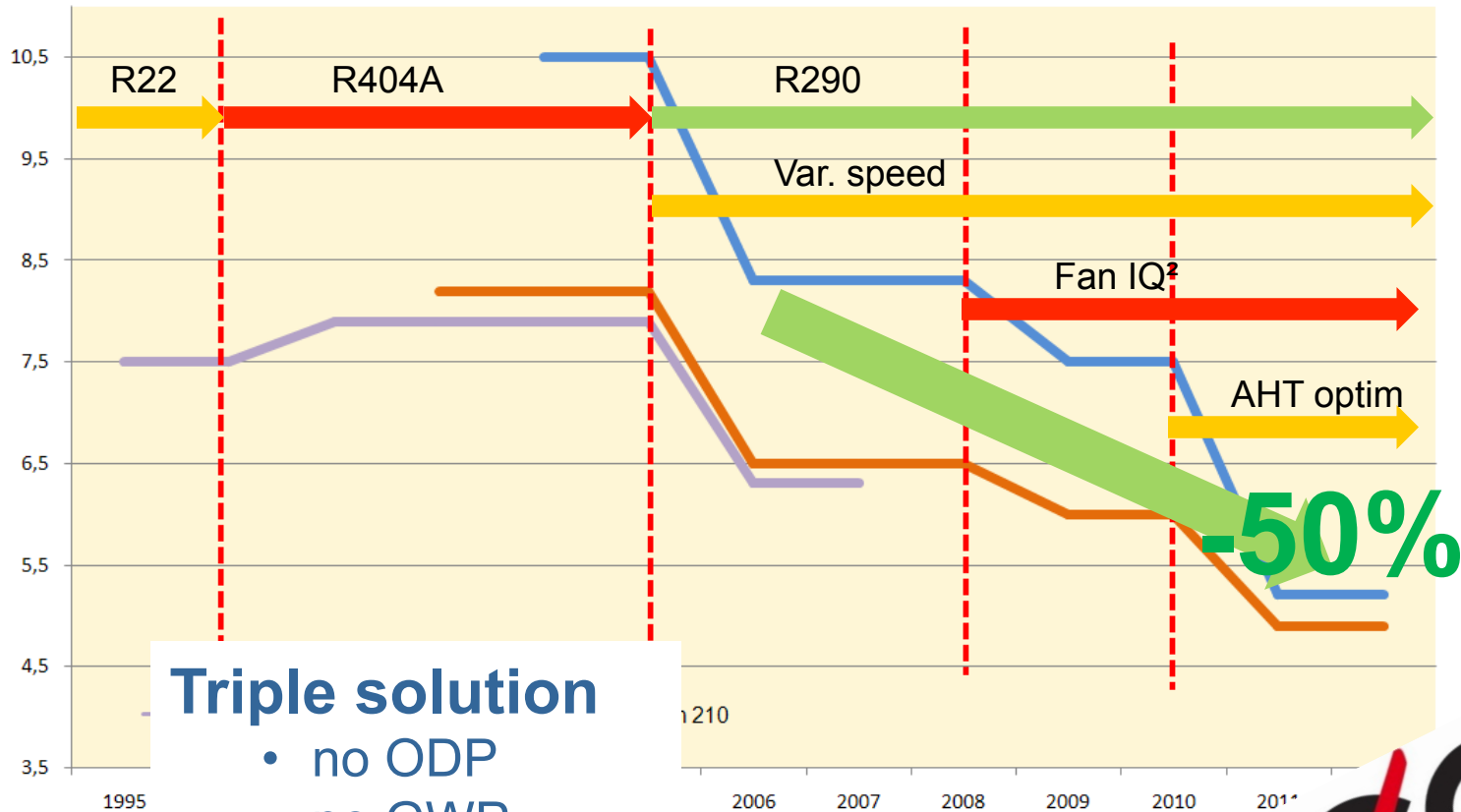
- indirect influences


 $(n \times E \times \beta)$

- energy consumption

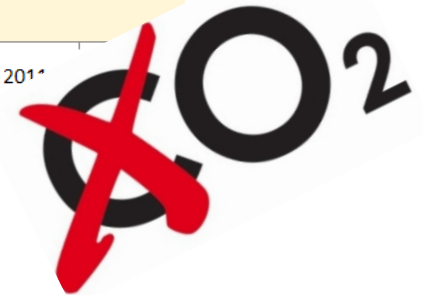


Reduction of the energy consumption



Triple solution

- no ODP
- no GWP
- minimal TEWI



Conclusion

technology and equipment is available now
natural refrigerants (R290, R600a) are future proof
R290 and R600a are the preferable refrigerants

R290 is the **best alternative refrigerant**

for the use in

- ice cream cabinets
- bottle coolers
- commercial freezers



n e t w o r k

natural refrigerants

17 July 2014 in Paris, France

Thank you



your “freshness partner” worldwide