

# **Natural Refrigerants - Innovation in Europe and the world**



**Geneva, 13 November 2012**

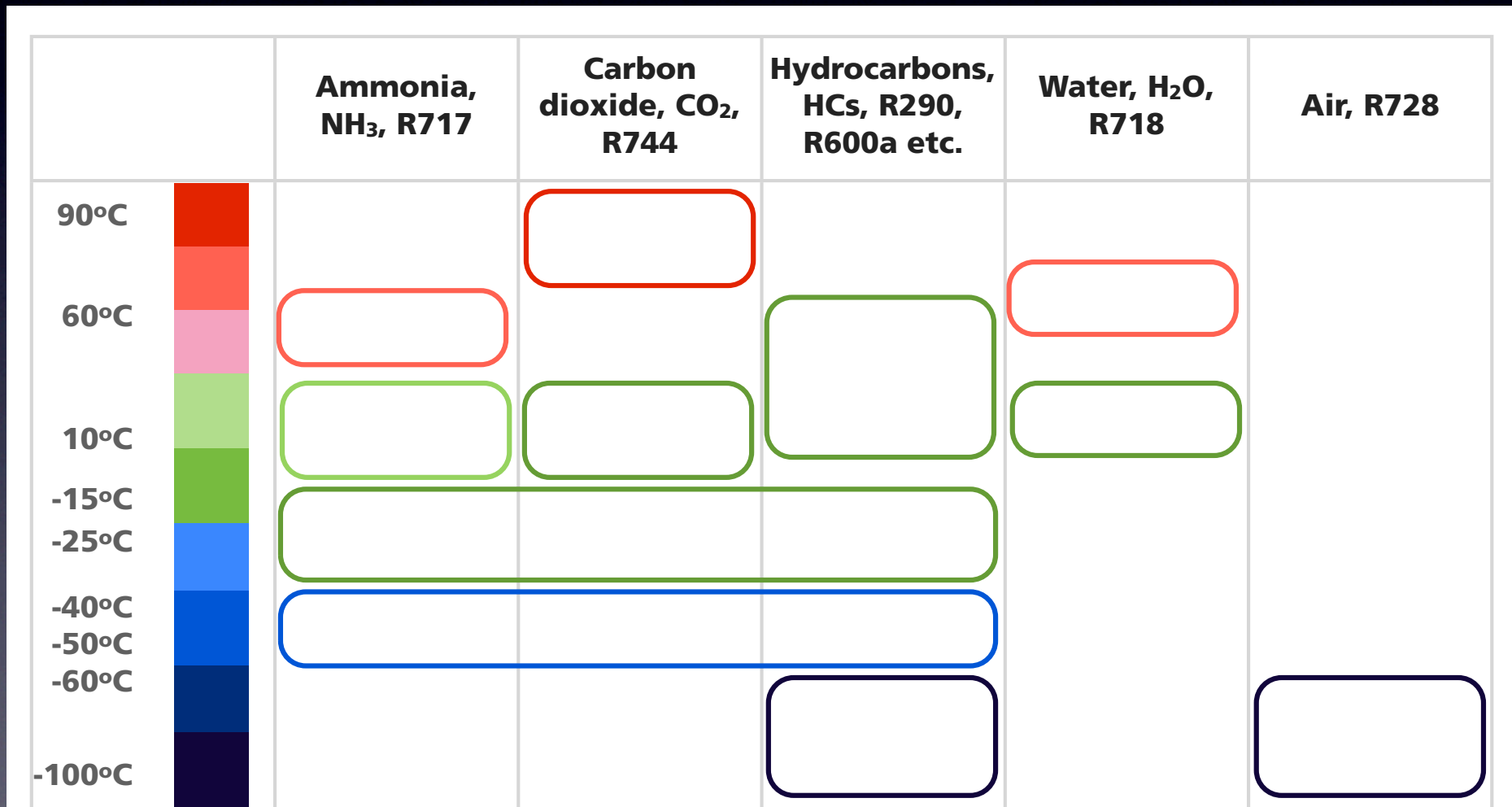
**Nina Masson, Head of Market Research**

**shecco**

# technology: the application potential...

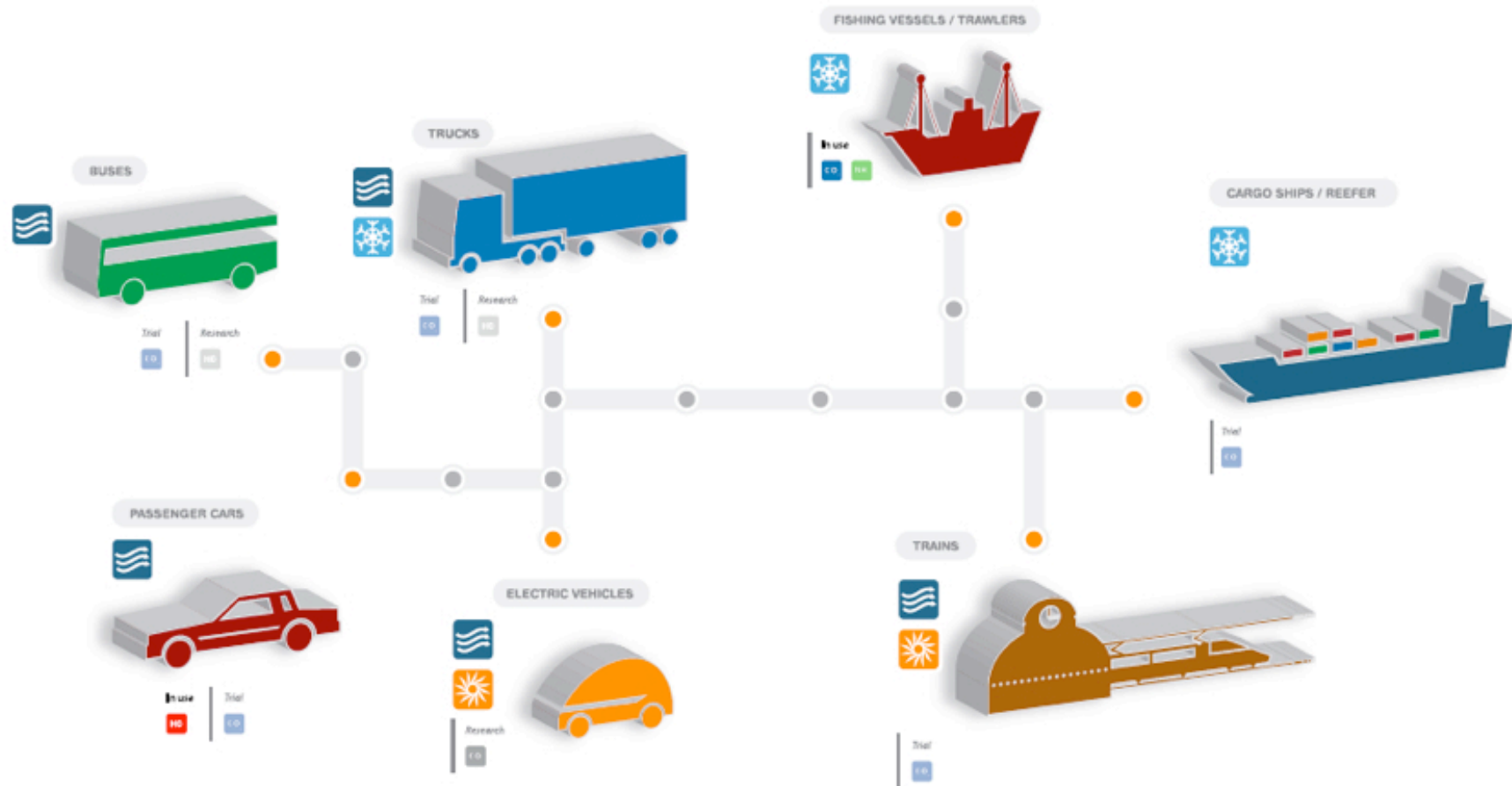


**Across the whole range of heating, cooling and refrigeration needs the "Natural Five" can cover all applications**



# ... in transport

## TRANSPORT APPLICATIONS



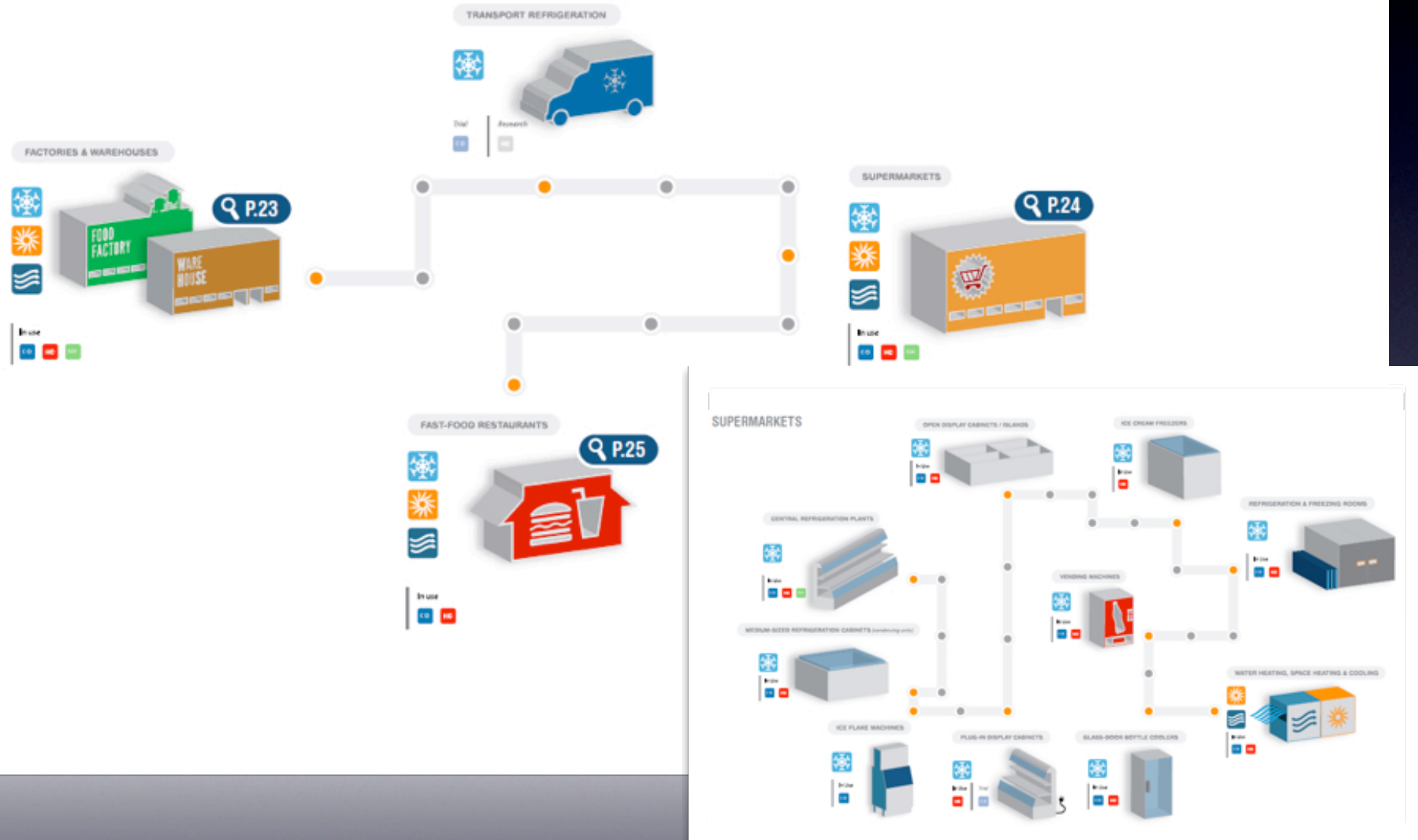
# ... in buildings

## CITY & BUILDINGS



# ... in the food retail chain

## THE FOOD CHAIN



# market: HFC-free in the world



**400 million HC  
fridges**

**1.2 million HC ice cream  
freezers (Unilever)**

**313,000 HFC-free bottle  
coolers (Red Bull)**



**20 million cars with  
HC air-conditioning**

**approx. 950,000 HFC-  
free vending machines  
(Coca-Cola + Pepsi)**

**the potential for HC  
chillers alone was  
estimated at 4 billion USD**

# industry surveys world / north america



## 2011:

- the **world's largest HVAC&R industry survey** to illustrate + quantify the market potential of natural working fluids
- 1,254 replies**

## 2012:

- specific survey to the North American HVAC&R industry: Canada, Mexico, USA
- 545 replies**

**guide** shecco publications  
North American HVAC&R Industry and End-User Survey about Natural Refrigerants - 2012

1. INTRODUCTION

Take part in this industry survey and enhance your understanding of the North American heating, air-conditioning and refrigeration (HVAC&R) market for the so-called "Natural Refrigerants" (carbon dioxide, ammonia, hydrocarbons, water, etc). Survey results will be published in the "GUIDE 2012: Natural Refrigerants - North America's Market Potential" in Summer 2012.

WHY PARTICIPATE?  
Survey participants will receive the RESULTS FREE, and organizations already active in Natural Refrigerants can receive a FREE DIRECTORY ENTRY in the GUIDE.

This survey is for INDUSTRY EXPERTS and commercial/industrial END-USERS with operations in CANADA, MEXICO and the USA. It will take you around 15 minutes to 1h in the survey, depending on the level of detail you provide. There is a maximum of 23 questions. We will keep your information confidential at all times. Thank you for your time!

\*1. Organization LOCATION:  
 Canada  Mexico  United States of America

\*2. Organization SIZE (employees):  
 Small (1-99)  Medium (100-499)  Large (500+)

\*3. Organization TYPE (please select all that apply):  
 End-User  Engineering / Contractor  Association  
 System Manufacturer  Consulting / Marketing   
 Component Supplier  Training / Research

\*4. Organization Fields of ACTIVITY (please select all that apply):  
 Heating - Residential  Refrigeration - Industrial  
 Heating - Industrial & Commercial  Refrigeration - Transport  
 Refrigeration - Domestic  Air Conditioning - Residential  
 Refrigeration - Light Commercial  Air Con...  
 Refrigeration - Commercial  Air Con...

Next

**shecco**  
THE FUTURE - Global HVAC&R Industry Survey on Natural Refrigerants

This HVAC&R industry survey is the first one about the global market for Natural Refrigerants (carbon dioxide, ammonia, hydrocarbons) in different applications. The results will be published in a "guide to natural refrigerants" in October 2011.

Why participate?  
If your organization is already active in Natural Refrigerants you will receive a FREE DIRECTORY ENTRY in the "guide". For all participants, we will share better market insights with you.

It will take you 10-15 minutes to 1h in the survey, depending on the level of detail you provide. We will keep your information confidential at all times. Thank you for your time!

\*1. Organization LOCATION (checkboxes):  
 Africa  Australasia  
 Europe  Asia  
 North America  Oceania

\*2. Organization TYPE (checkboxes):  
 End-User  Engineering / Contractor  
 System Manufacturer  Consulting / Marketing  
 Component Supplier  Training / Research

\*3. Fields of ACTIVITY (checkboxes):  
 Heating - Residential  Refrigeration - Industrial  
 Heating - Industrial & Commercial  Refrigeration - Transport  
 Refrigeration - Domestic  Air Conditioning - Residential  
 Refrigeration - Light Commercial  Air Con...  
 Refrigeration - Commercial  Air Con...

Next

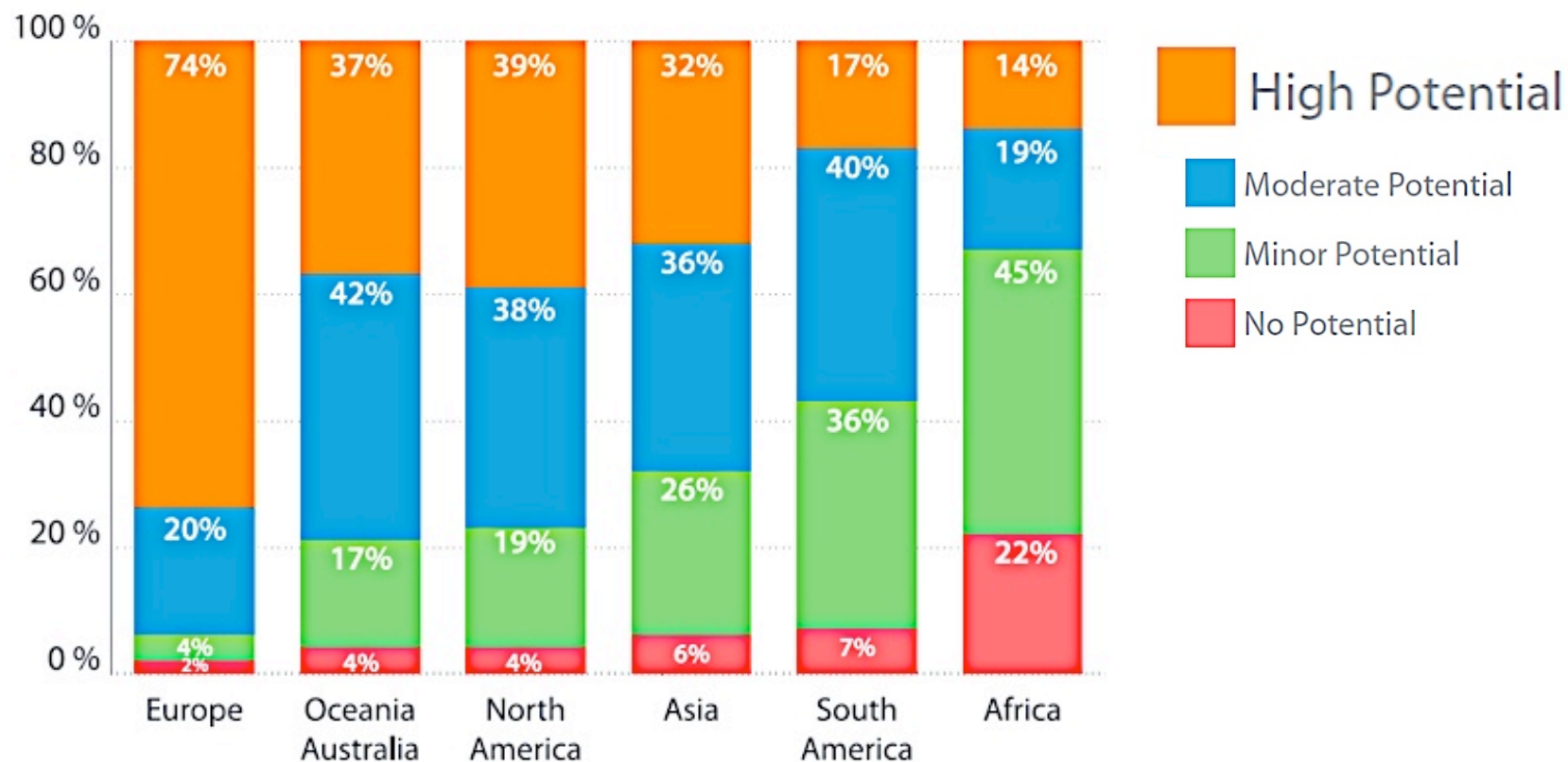
**NORTH AMERICA**

**WORLD**

# market potential for natural refrigerants

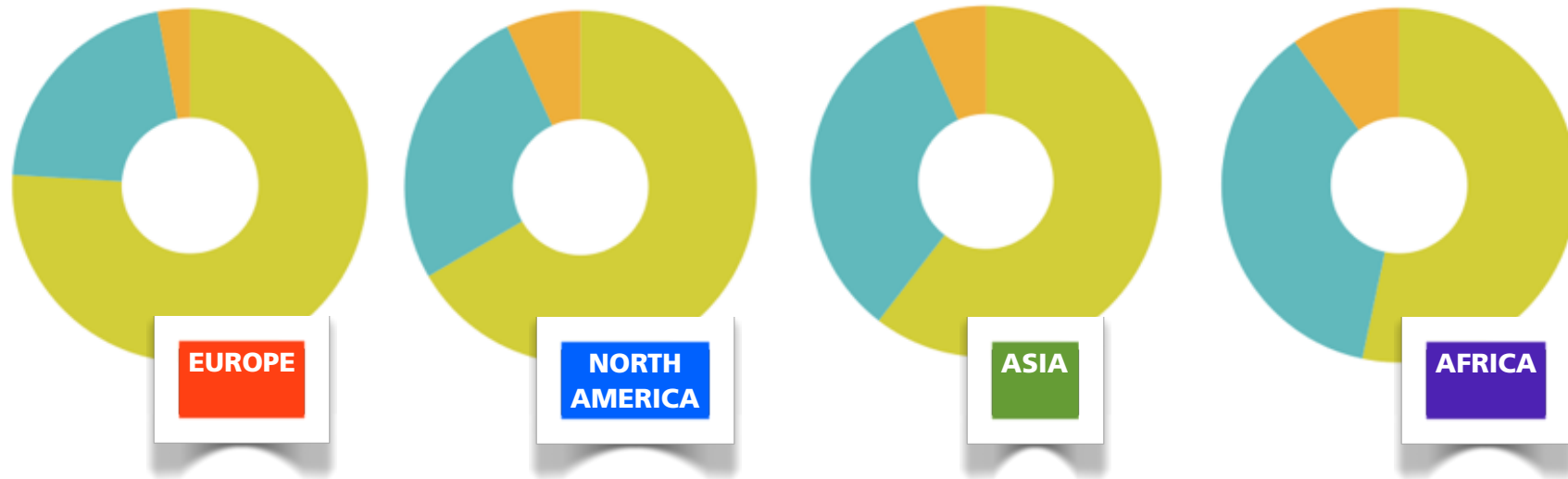


**Europe has the greatest immediate adoption potential for Natural Refrigerants - South America, Africa moderate to minor potential**





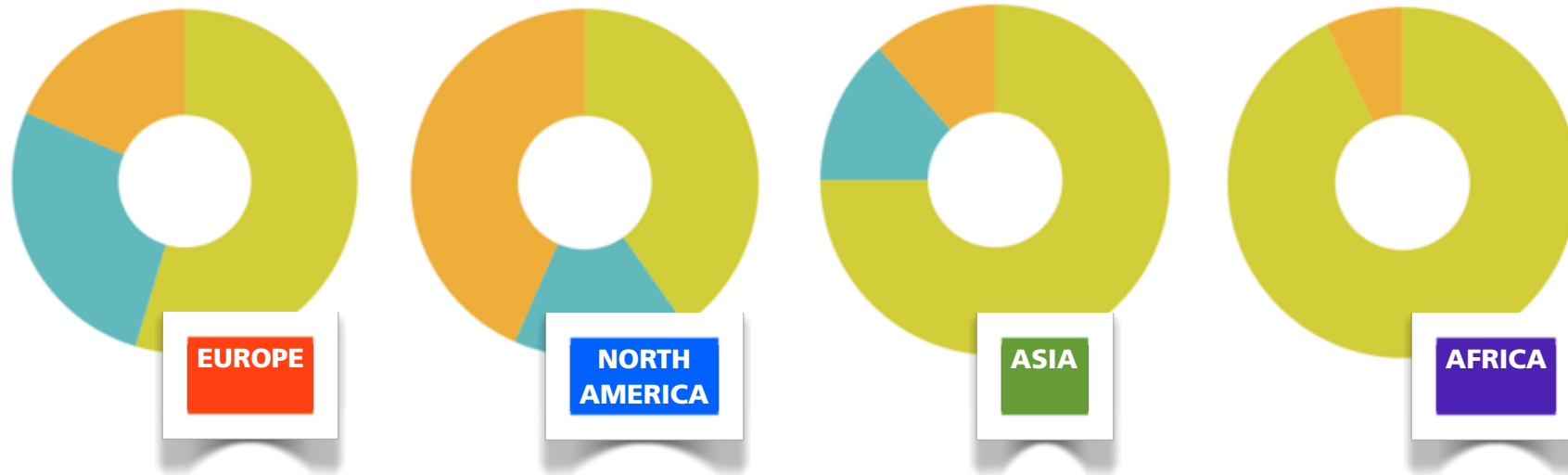
# respondents: NR use today



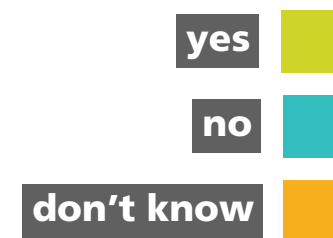
- ▶ **Europe: 76% yes - 21% no**
- ▶ **North America: 67% yes - 26% no**
- ▶ **Asia: 60% yes - 33% no**
- ▶ **Africa: 53% yes - 37% no**



# NR future use by current "non-NR" industry



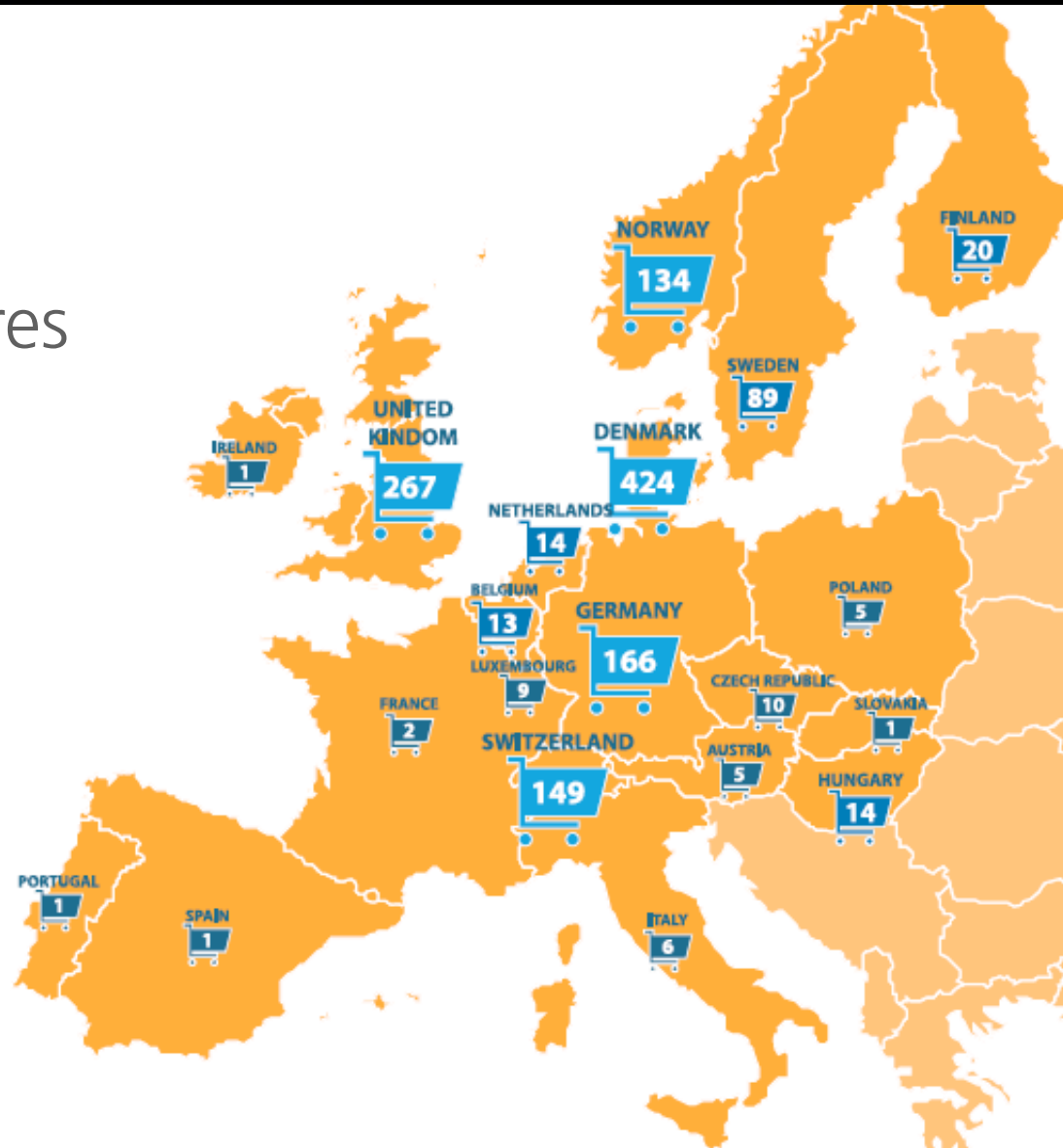
- ▶ **Europe: 55% say they will use them in the future**
- ▶ **North America: 40% say yes**
- ▶ **Asia: 75% say yes**
- ▶ **Africa: 93% say yes**



# transcritical CO<sub>2</sub> supermarkets 2011



**verified:** 1,331  
transcritical CO<sub>2</sub> stores  
by mid-2011 for  
Europe

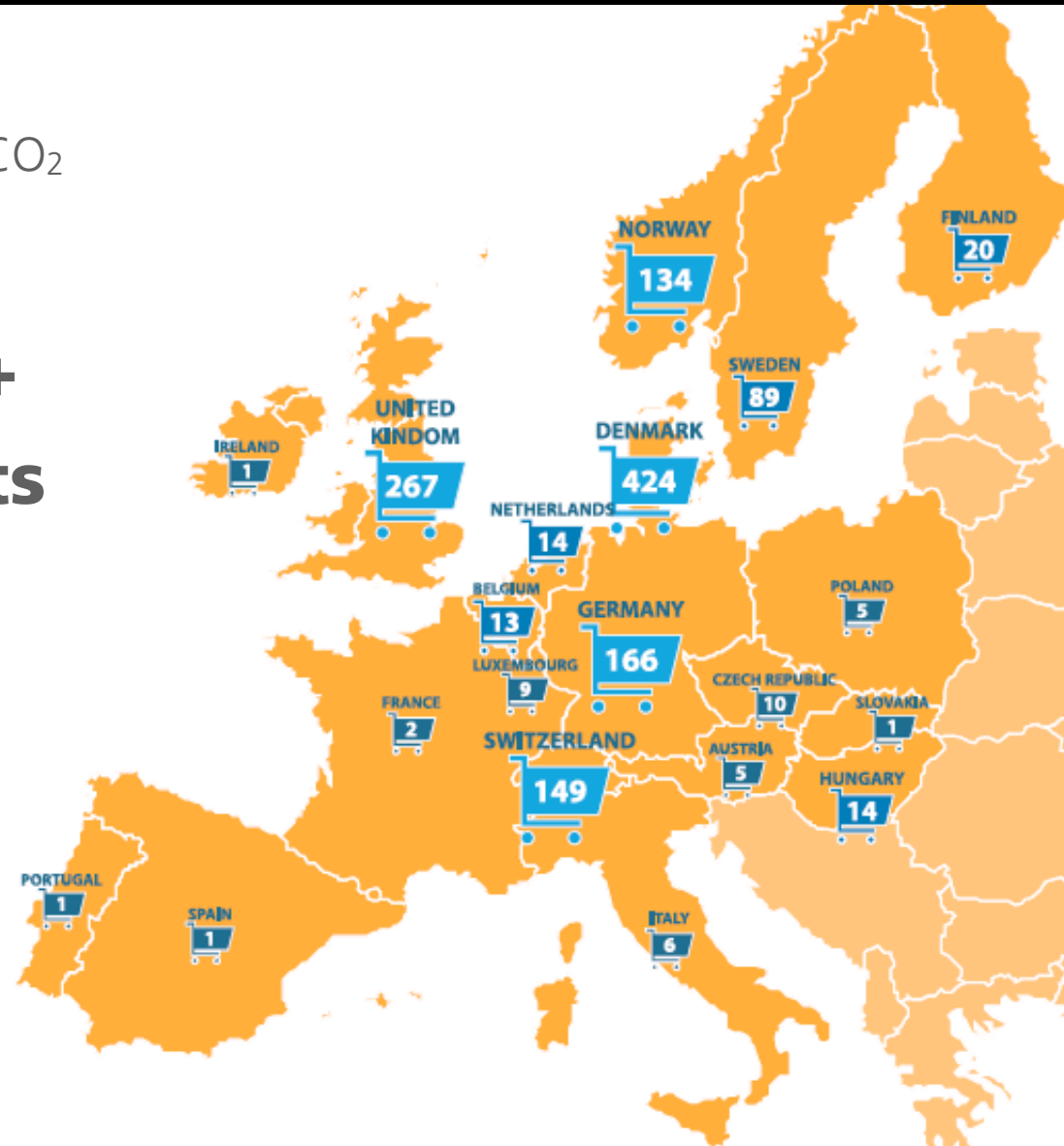


# transcritical CO<sub>2</sub> supermarkets 2012



**verified:** 1,331 transcritical CO<sub>2</sub> stores by mid-2011 for Europe

**estimated: 1600+ CO<sub>2</sub> supermarkets by end-2012**



# natural refrigerants supermarkets



verified: 1,331 transcritical CO<sub>2</sub> stores by  
mid-2011 for Europe

estimated: 1600+ CO<sub>2</sub> supermarkets by  
end-2012

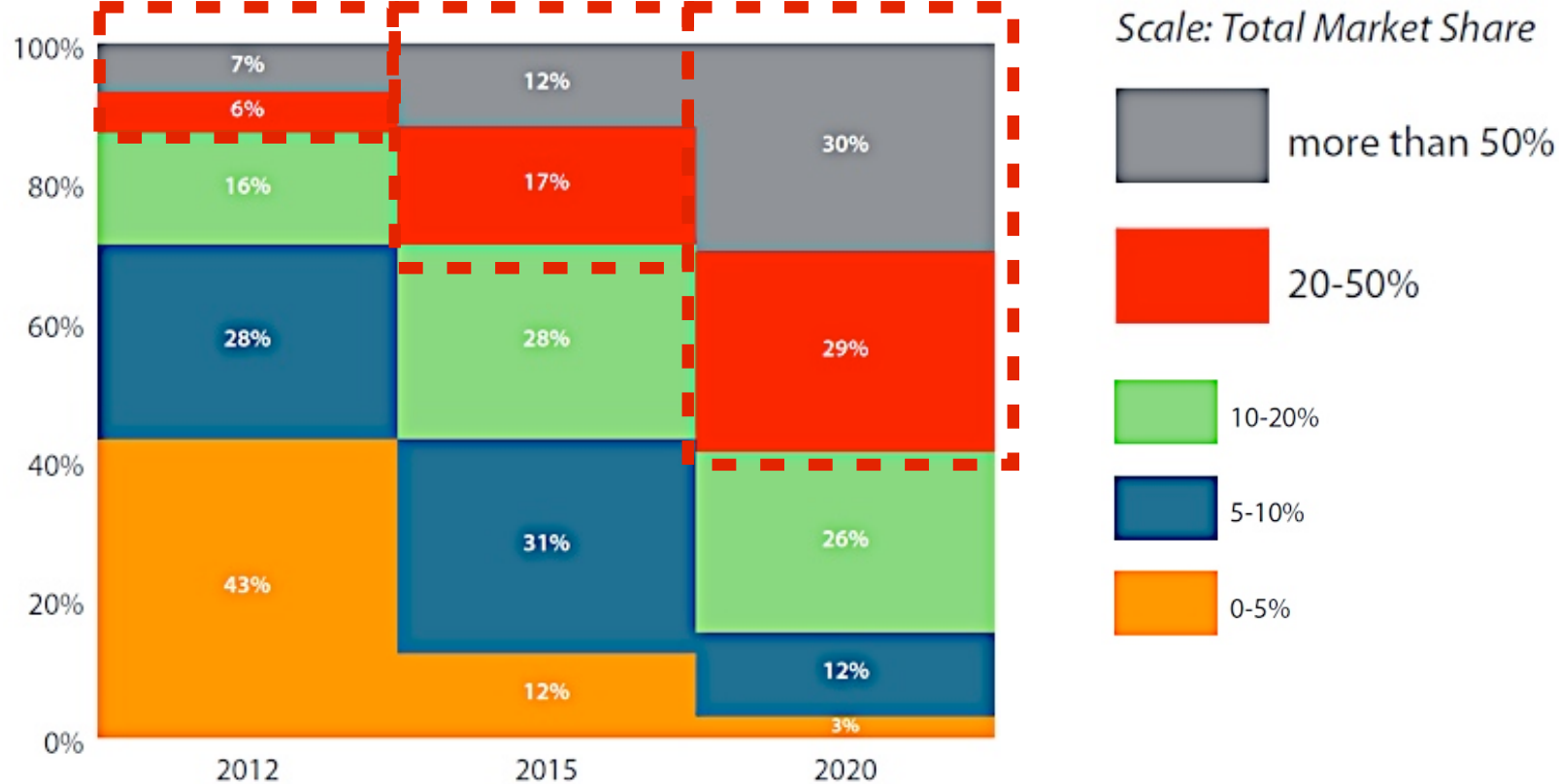
**estimated: 3000+  
supermarkets using CO<sub>2</sub>,  
ammonia and/or  
hydrocarbons  
refrigeration**



# market: "natural" in commercial refrigeration



**59% of industry says: by 2020 the market share of natural refrigerants in commercial refrigeration can be 20% and more**



# market potential for Europe



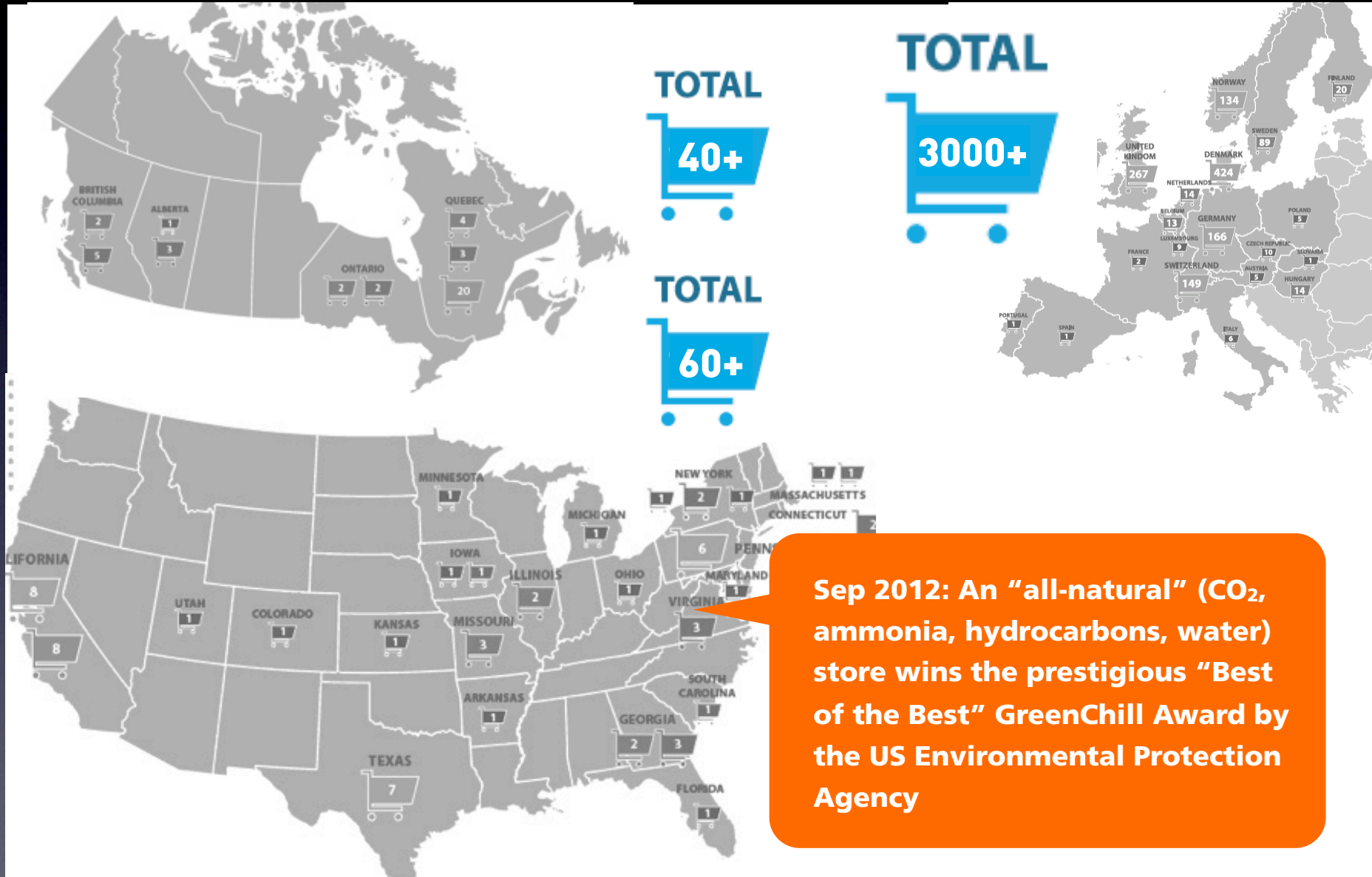
a minimum of  
**34 food retailers**  
use natural  
refrigerants



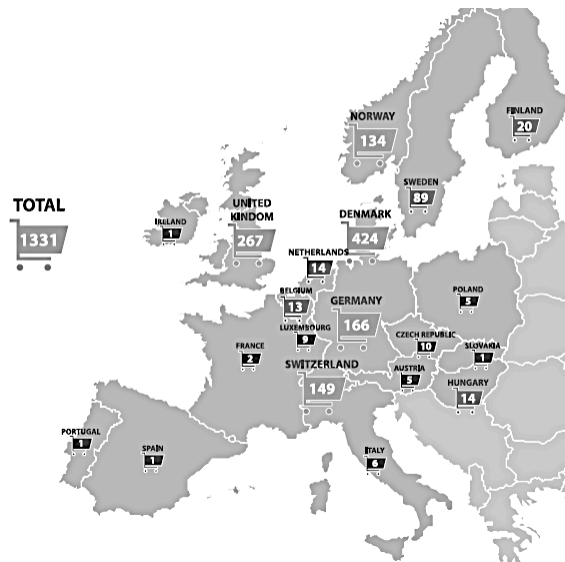




# natural refrigerant supermarkets



# natural refrigerant supermarkets



**TOTAL**  
3000+



**TOTAL**  
2



**TOTAL**  
100+

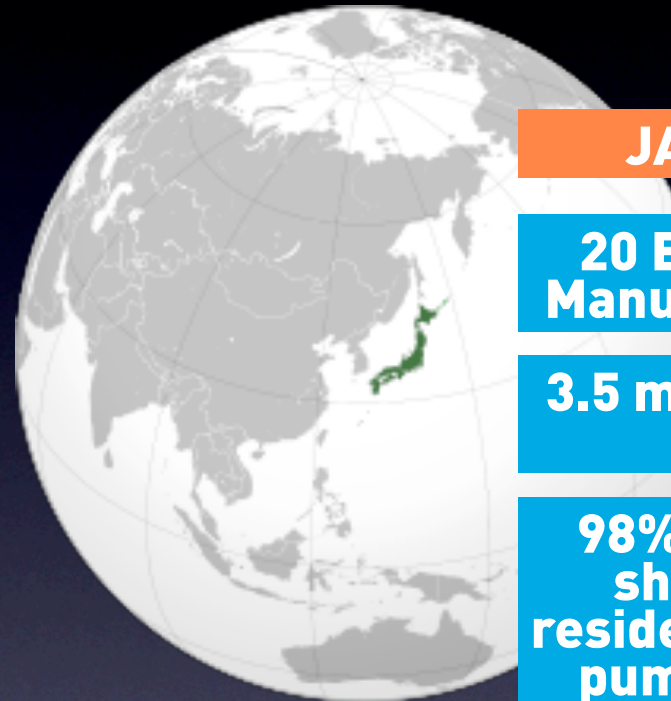
# CO<sub>2</sub> heat pumps in the world



## EUROPE

**16  
Manufacturers**

**max 3% market  
share for  
residential heat  
pumps**



## JAPAN

**20 Eco-Cute  
Manufacturers**

**3.5 million CO<sub>2</sub>  
HP**

**98% market  
share for  
residential heat  
pump water  
heaters**

**500,000 units  
production /  
year**



## CHINA

**100,000 units  
production  
capacity / year**

# NH<sub>3</sub> industrial refrigeration



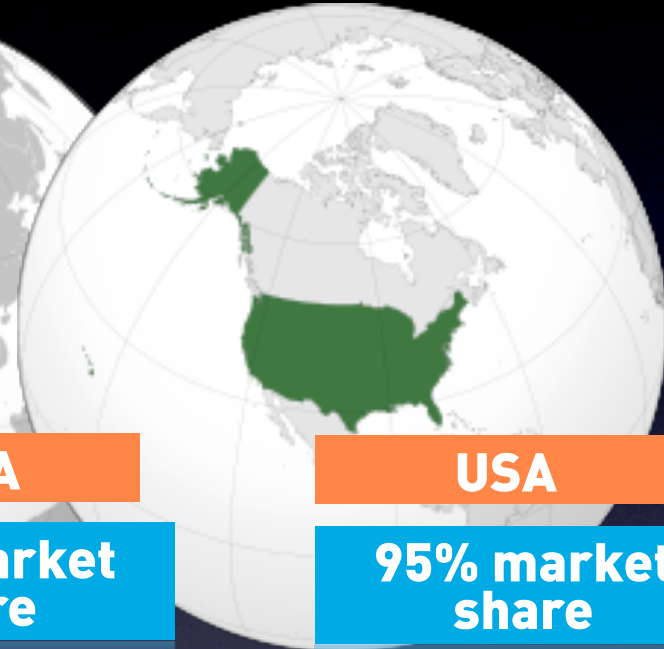
**EUROPE**

**90% market share**



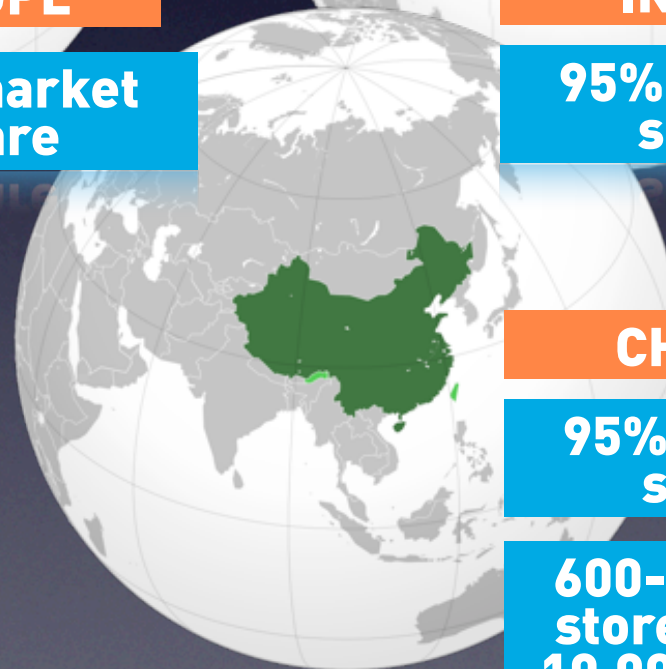
**INDIA**

**95% market share**



**USA**

**95% market share**

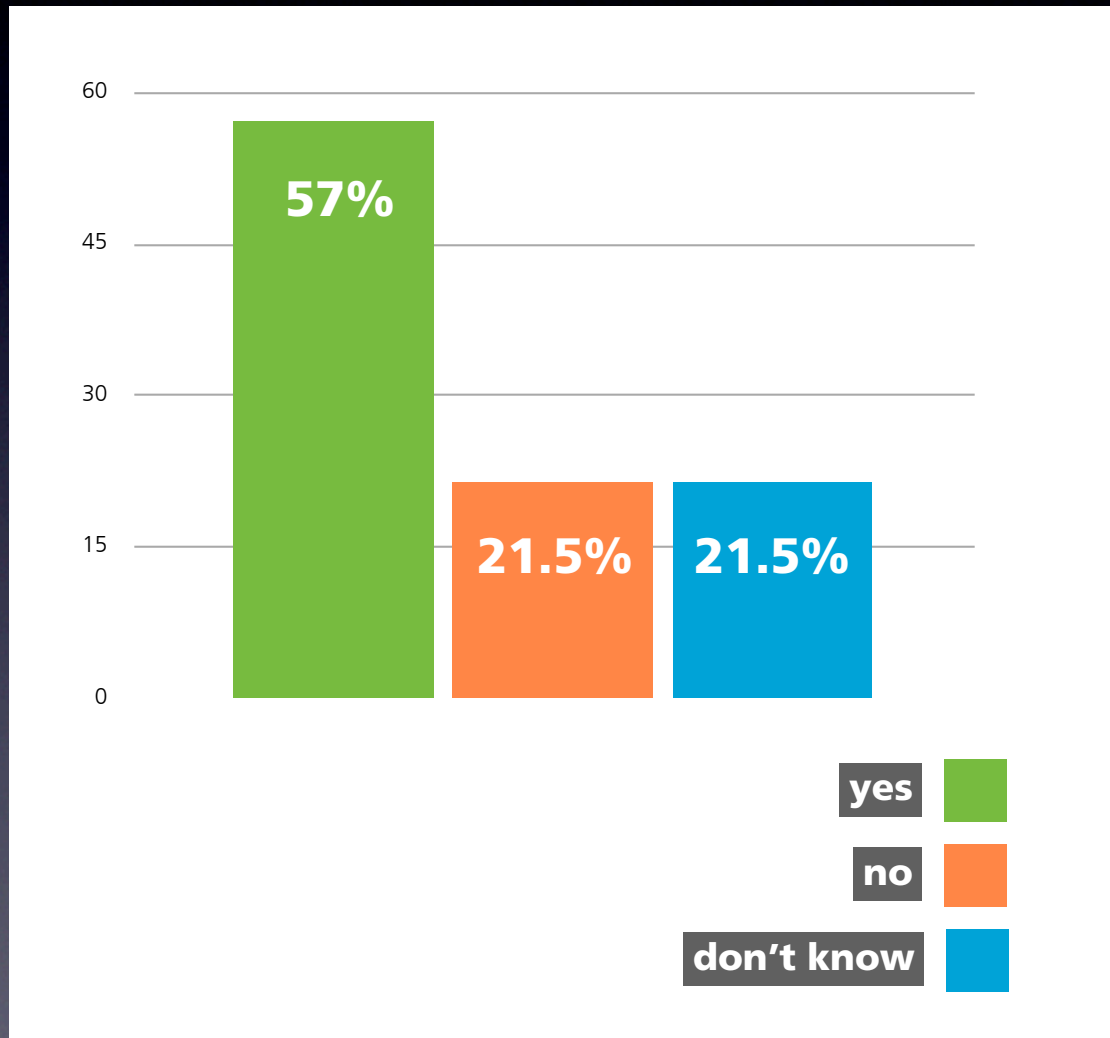


**CHINA**

**95% market share**

**600-800 cold stores above 10,000 tonnes**

# India: survey on acceptability of hydrocarbon air-conditioners

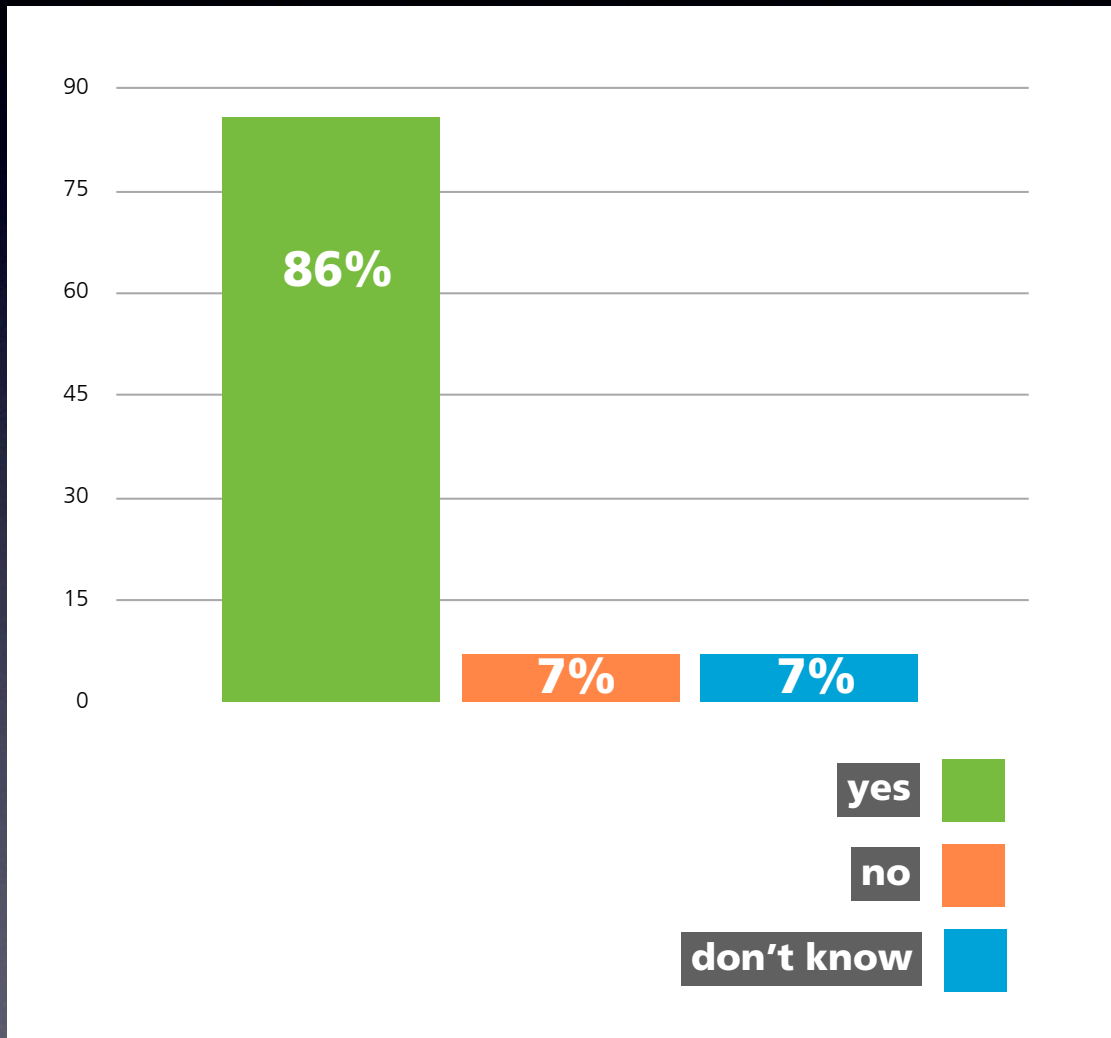


- **telephone survey conducted in September 2012 to 100 architects, energy consultants, air conditioner sales and service dealers in Mumbai area**

Q: "Would you be willing to accept a price of 30.000 Indian Rupees for an air conditioner, including free installation from certified technicians?"

source: shecco telephone survey September 2012

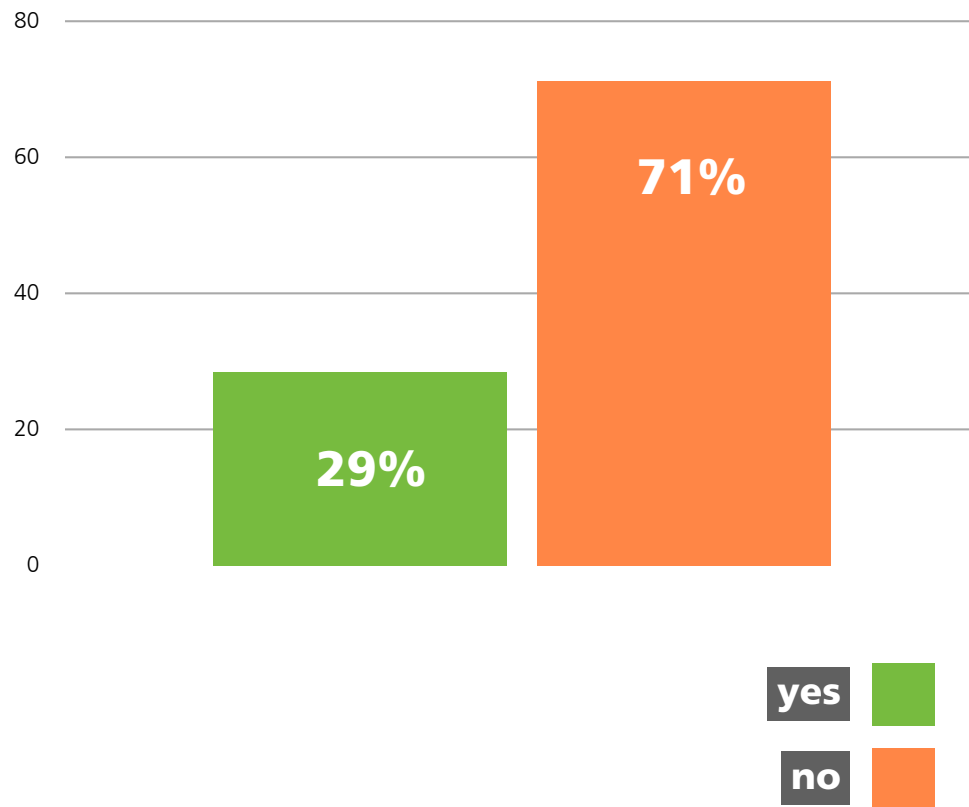
# India: survey on acceptability of hydrocarbon air-conditioners



Q: "Would you be interested in learning about room A/C products that are more environmentally friendly than current ones?"

source: shecco telephone survey September 2012

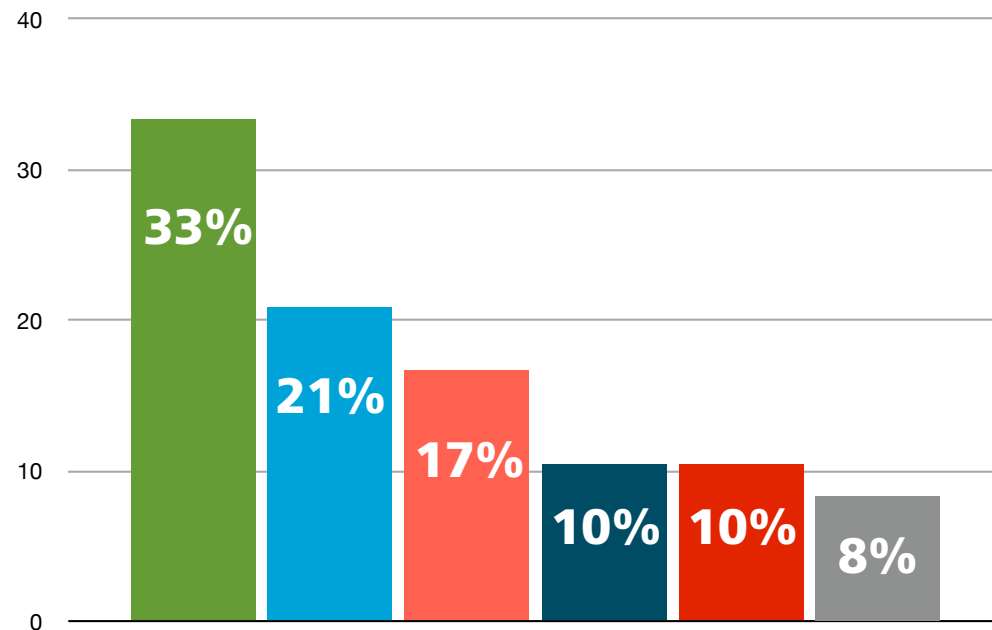
# India: survey on acceptability of hydrocarbon air-conditioners



Q: "Have you heard about climate friendly natural refrigerants?"

source: shecco telephone survey September 2012

# India: survey on acceptability of hydrocarbon air-conditioners



Q: "What organisations do you trust most to inform you about climate friendly air conditioners?"

source: shecco telephone survey September 2012



# GUIDEs: published & upcoming



**GUIDE  
Europe**

**Feb 2012**



**GUIDE North  
America**

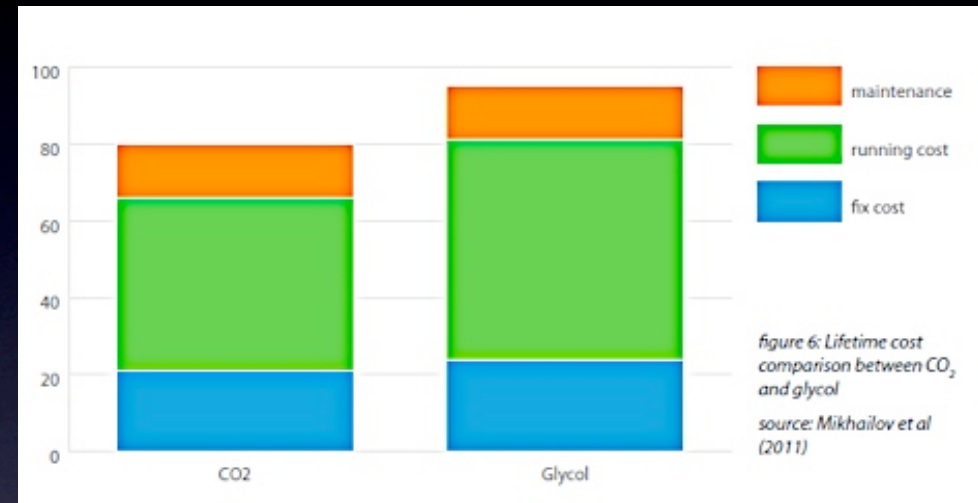
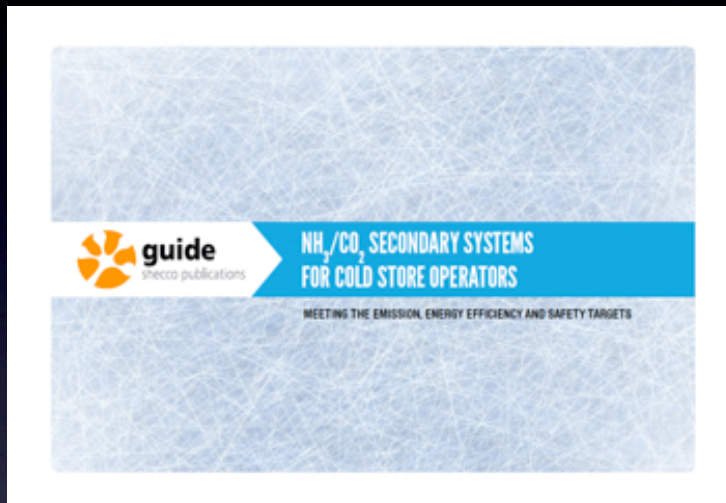
**launch:  
Dec 2012**



## **GUIDEs 2013:**

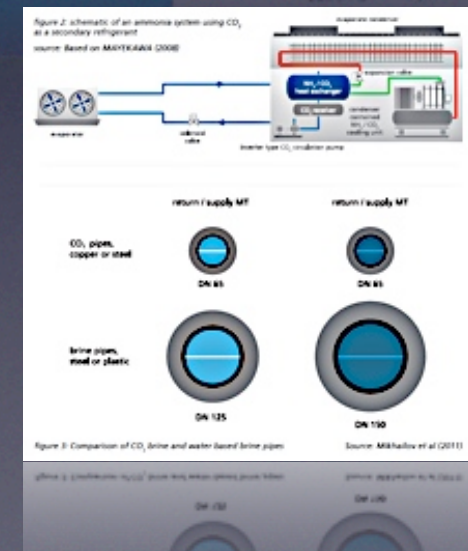
- ◎ **Europe 2nd edition**
- ◎ **Japan**
- ◎ **China**

# GUIDE to NH<sub>3</sub>-CO<sub>2</sub> Secondary Systems for Cold Storage Operators



## Content:

- secondary NR systems in industrial refrigeration
- technology, safety, costs, best-practice guide, case studies



# ATMOsphere Europe 2012 Report



## Content:

- ⦿ **market & technology trends**
- ⦿ **End-User (food retail) & Consumer Goods Panels**
- ⦿ **EU policy & regulation**



# Case Study booklet - A5 / EITs



## Content:

- ◎ **case studies for natural refrigerants from shecco's industry platforms**
- ◎ **[www.R744.com](http://www.R744.com)**
- ◎ **[www.ammonia21.com](http://www.ammonia21.com)**
- ◎ **[www.hydrocarbons21.com](http://www.hydrocarbons21.com)**



# shecco market research



## GUIDEs:

<http://guide.shecco.com>

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+32 473 468 194

**guide**  
shecco publications

shecco's market research department publishes an easy-to-access online reference series for the global market for natural refrigerants known as "GUIDEs", which include the following:

- » Market outlook based on industry survey
- » CO<sub>2</sub> supermarket maps
- » End-user views and case studies

The GUIDE "Market Growth for Europe" is freely available as a download, and will soon be followed by "North America's Market Potential", and "China's Market Potential".

shecco's market research department offers:

- » Tailor-made market studies depending on your budget and needs
- » Multi-client market research for industry, trade, and NGOs
- » News monitoring & continuous market tracking
- » Policy audits & issue tracking
- » Funding audits & grant project management
- » Consultancy services, partner assessment, customer search

We provide quantitative and qualitative marketing research to ensure the most appropriate and cost effective methodologies are used on each project. Market research services include:

- » Research design and set-up
- » Online & telephone surveys, in-depth interviews
- » Data processing & analysis
- » SWOT analysis & trend forecasting

Whilst shecco's multidisciplinary team has a wealth of knowledge across the range of "green technologies", we have special access to a global network of industry and policy decision makers in the following areas:

- » Natural refrigerants
- » Heating, ventilation, air conditioning and refrigeration (HVAC&R)
- » Electric Vehicles (four wheelers, scooters / bikes etc.)