

GUIDE 2012: Natural Refrigerants in the HVAC&R industry - a global study of market & policy trends



DUBAI, 20 March 2012

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shecco



shecco

SUSTAINING OUR ATMOSPHERE

about shecco



- ◎ b2b marketing & communication expert
- ◎ mission _ climate friendly technologies faster to market
- ◎ focus _ HVAC&R & transport sectors
- ◎ expertise _ natural refrigerants (CO₂, NH₃, HC + Air, Water)

100+ partners worldwide



our business areas



public affairs

industry platforms

market research

special projects

events management

getting your technologies

faster to market

industry platforms



- shecco manages 3 industry online platforms informing about and promoting natural refrigerant technologies
 - news - products - community
 - 2000+ articles about natural refrigerants
 - 1.5 million+ page views
 - 8000 +/- experts (incl. policy), 150 + countries (including Middle East)
 - www.R744.com
 - www.ammonia21.com
 - www.hydrocarbons21.com



media partnership



news, products, community - ammonia21.com is the industry platform for ammonia cooling and heating experts worldwide.

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Refrigerants Review in Dubai: identifying the ideal refrigerant

01 March 2012

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On 20-21 March in Dubai, United Arab Emirates, the Refrigerants Review will take place as a 2-day event aiming at identifying the ideal refrigerant for high, medium and low-temperature applications. The event is supported by Ministries of Environment from the Middle East region, the US Department of State, and the Dubai Municipality.

The aim of the Refrigerants Review, as a first part of discussions to be continued in September this year, is to initiate a debate on viable alternatives to ozone-depleting and high global warming refrigerants in the Middle East region. Participants also aim to determine a set of recommendations and solutions related to reclaiming and recycling refrigerants as well as methods to identify and prevent refrigerant leaks.



The parameters taken into account to define the ideal refrigerants will include aspects such as: health and safety, effect on the environment (ODP, GWP and TEWI), energy efficiency, compatibility with existing technologies (reaction with materials in contact and effect on cost), stability under different pressures and temperatures, effect on equipment size/footprint, availability and price.

"The responsible use and handling of refrigerants cannot be overstated," says B Surendar, the Editor of Climate Control Middle East magazine, which is producing Refrigerants Review. "It is incumbent upon each of us to understand the overall profile of each refrigerant and adopt those that serve to mitigate climate change, do not harm the ozone layer and ensure human health and safety."

Related articles

Middle East invests in Ammonia

13 January 2009

Potential for ammonia in district cooling in the Middle East

12 September 2011

How ammonia district cooling can be joined with desalination

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12 December 2011

Community feed

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Posted new comment: Ammonia applications developments and market trends in North A...

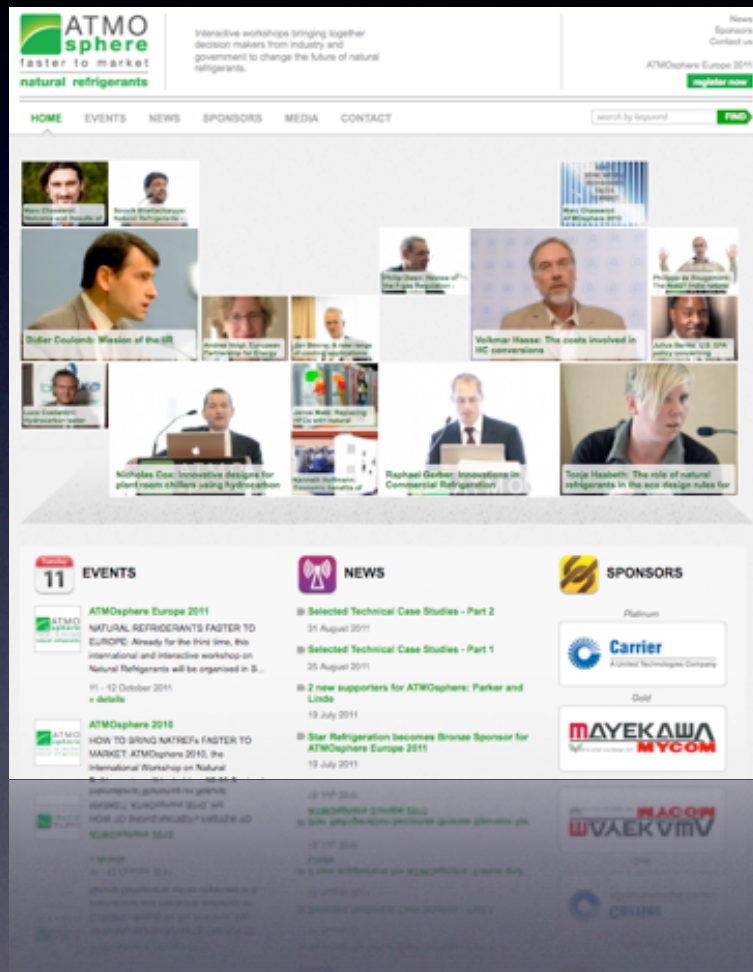
global community



The screenshot displays the R744.com website interface. At the top left is the R744.com logo with the tagline 'news, products, community - R744.com is the business-to-business platform for CO₂, heating and cooling experts worldwide.' and 'Everything R744'. A navigation bar includes links for HOME, NEWS, PARTNERS, COMPANIES, PRODUCTS, KNOWLEDGE, EVENTS, and MYR744. Below this is a 'Community Activities' section with a search bar and a 'Find' button. The main content area features a 'COMMUNITY ACTIVITIES' header with '12 new activities since your last login.' and a 'Share' button. A user named 'dongha lee' is shown looking for a 'Seal' for a CO₂ Heat pump. Another activity mentions 'Marc Chasserot will attend: 23rd IIR International Congress of Refrigeration' from August 21-26, 2011 in Prague, Czech Republic. On the right side, there are sections for 'Notifications' (2 requests, 3 messages), 'People' (listing Daniel de Beer, Klaas Visser, and Sabine Lobnig), and 'Popular Products'.

- free registration to exchange knowledge, connect with partners, customers
- set up meetings, comments, network updates
- download papers, presentations
- coming very soon: the first global professional network for natural refrigerants - share content about CO₂, NH₃ and HCs without any barriers

ATMOsphere - faster to market



- international workshop series launched in 2009
- objective: spur exchange between policy & industry experts
- methodology:
 - presentations
 - panel debates
 - roundtable group discussions
- visit: www.ATMO.org

ATMOsphere America 2012



ATMO the Business Case
AMERICA sphere natural refrigerants

June 12-13 2012 | Washington DC



THE BUSINESS CASE FOR NATURAL REFRIGERANTS IN NORTH AMERICA:

The first-ever North American **ATMOsphere Natural Refrigerants Workshop** will be held in Washington, DC on June 12-13, 2012.

ATMOsphere America 2012 comes at a time when more and more companies in the US and Canada are looking into Natural Refrigerants as alternative working fluids in commercial and industrial refrigeration, heat pumps as well as air-conditioning applications.

Around 200 key industry experts and stakeholders are expected to attend **ATMOsphere America 2012** to discuss the Business Case for Natural Refrigerants. This dynamic, interactive event will engage participants, enhancing awareness and exploring the promising potential of the use of natural refrigerants such as CO₂, ammonia and hydrocarbons in the North American market.

- Washington DC, 12-13 June 2012
- 'Business Case' North America
- conference format
- 200 participants, mostly industry experts
- increasing interest in natural refrigerants:
 - ammonia: strong market
 - carbon dioxide: growing market
 - hydrocarbons: emerging market

“GUIDE to Natural Refrigerants”



<http://guide.shecco.com>

“GUIDE to Natural Refrigerants”



- ◎ **Aim:** the first approach to illustrate + quantify the global market potential for NR
- ◎ **Aim:** outline industry’s expectations for the period 2012-2020 for NR (CO₂, NH₃ & HCs)
- ◎ **Aim:** show barriers & opportunities for NR, analyse the political situation in the EU, give an overview of who is active in NR in Europe (industry directory)
- ◎ **Target group:** new entrants and experts
- ◎ **Focus:** global / European Union
- ◎ **Free access:** download available to policy makers, the HVAC&R industry and end-users

NR characteristics & potential



NATURAL REFRIGERANT CHARACTERISTICS

REFRIGERANT	REFRIGERANT NUMBER	CHEMICAL FORMULA	GWP (100 YEARS)	ODP	NORMAL BOILING POINT (°C)	CRITICAL TEMPERATURE (°C)	CRITICAL PRESSURE (BAR)	SAFETY GROUP
Ammonia	R717	NH ₃	0	0	-33.3	132,4	114.2	B2
Carbon dioxide	R744	CO ₂	1	0	-56.6	31,1	73.8	A1
Propane	R290	C ₃ H ₈	3.3	0	-42.1	96.7	42.5	A3
Isobutane	R600a	C ₄ H ₁₀	4	0	-11.8	134.7	36.48	A3
Propylene	R1270	C ₃ H ₆	1.8	0	-48	91	46.1	A3
Water	R718	H ₂ O	0	0	100	373.9	217.7	A1
Air	R729	-	0	0	-194.5	-	-	-

- **zero ozone-depleting**
- **no or very low GWP (max 4)**
- **together can replace all F-gases in all applications now or in the near future**

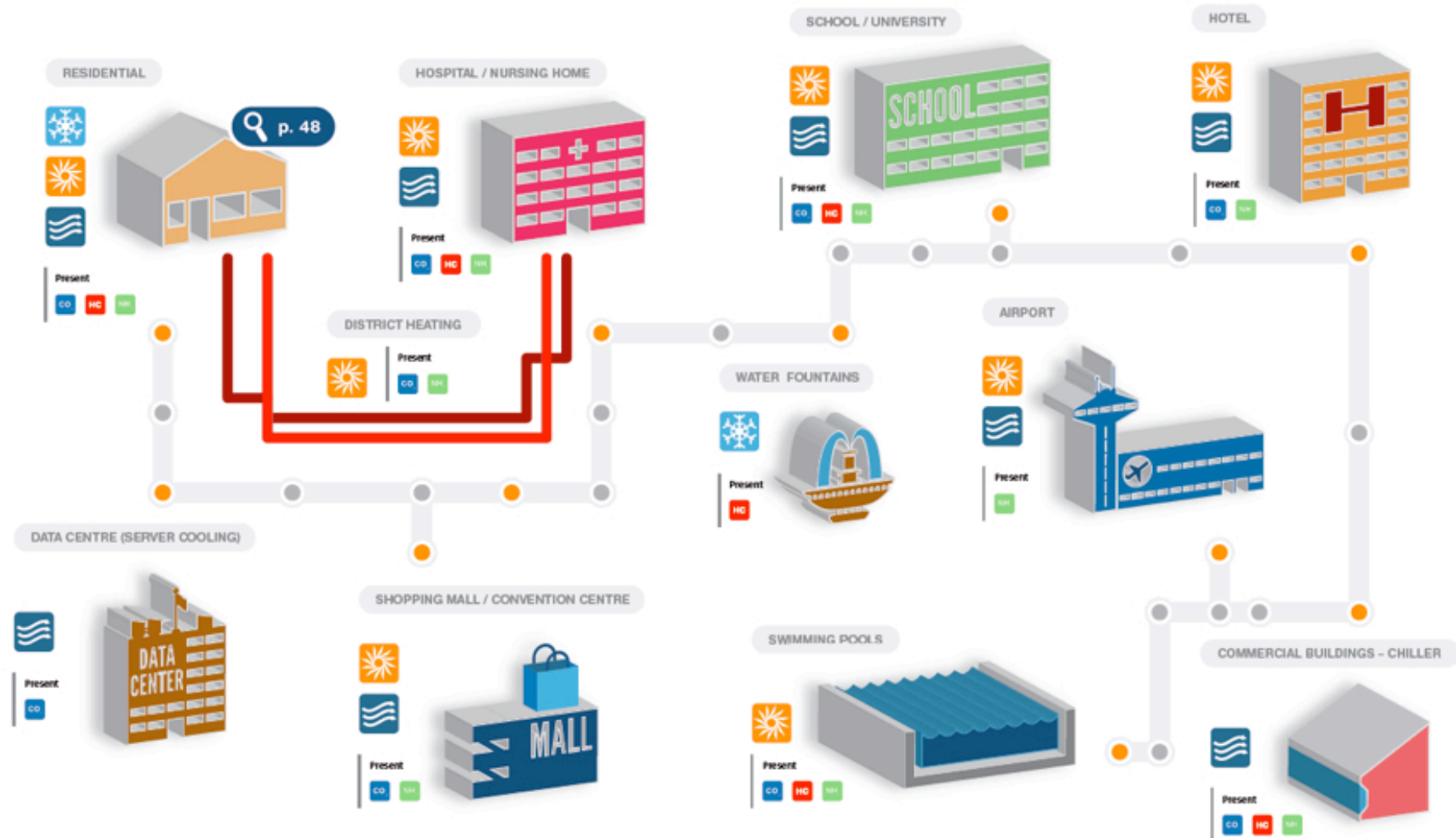
NR in the transport sector

TRANSPORT APPLICATIONS ILLUSTRATION



NR in city & buildings

CITY & BUILDINGS ILLUSTRATION



NR in industry & special applications

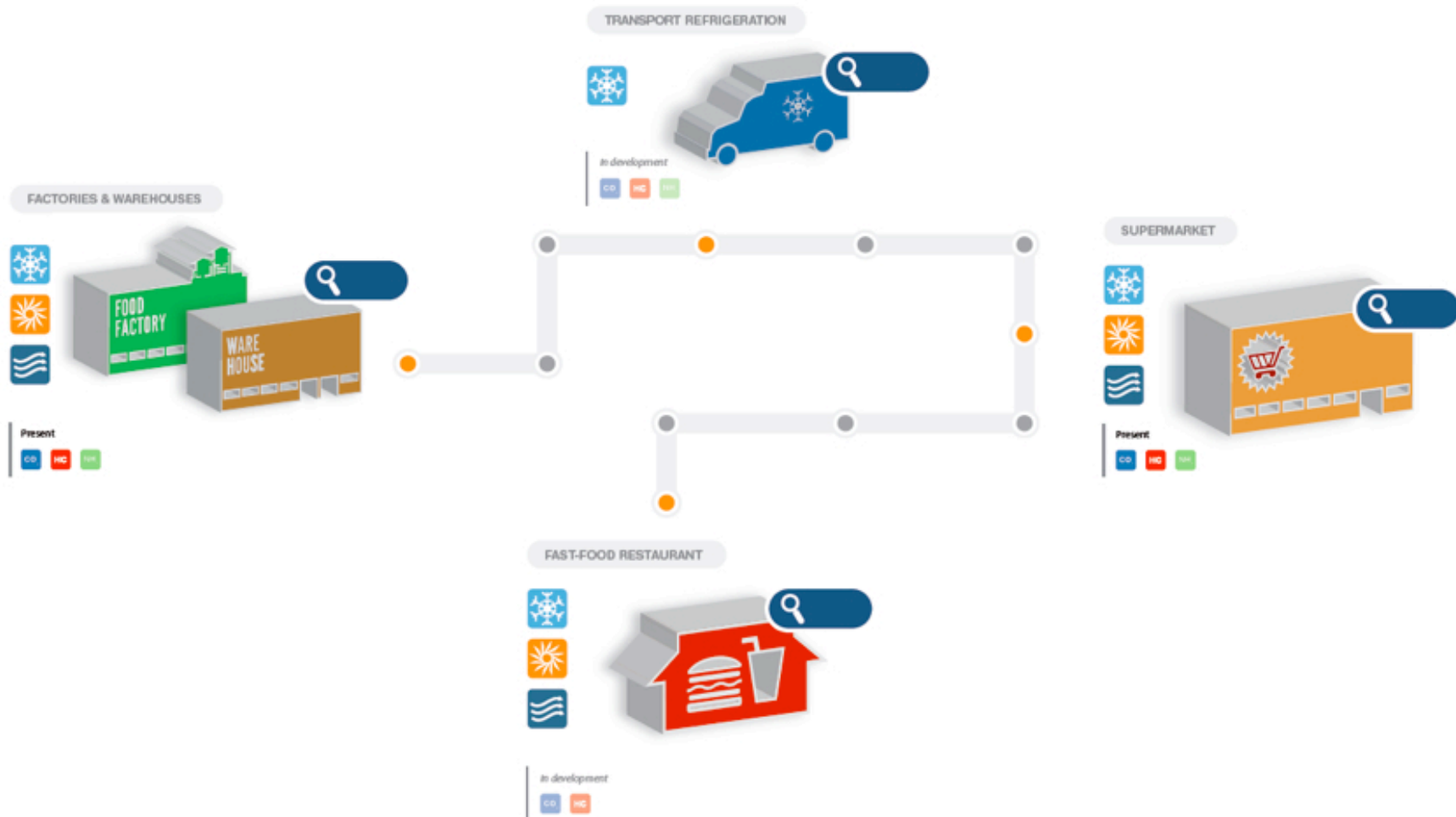


INDUSTRY AND SPECIAL APPLICATIONS



NR in the food cold chain

THE FOOD CHAIN ILLUSTRATION



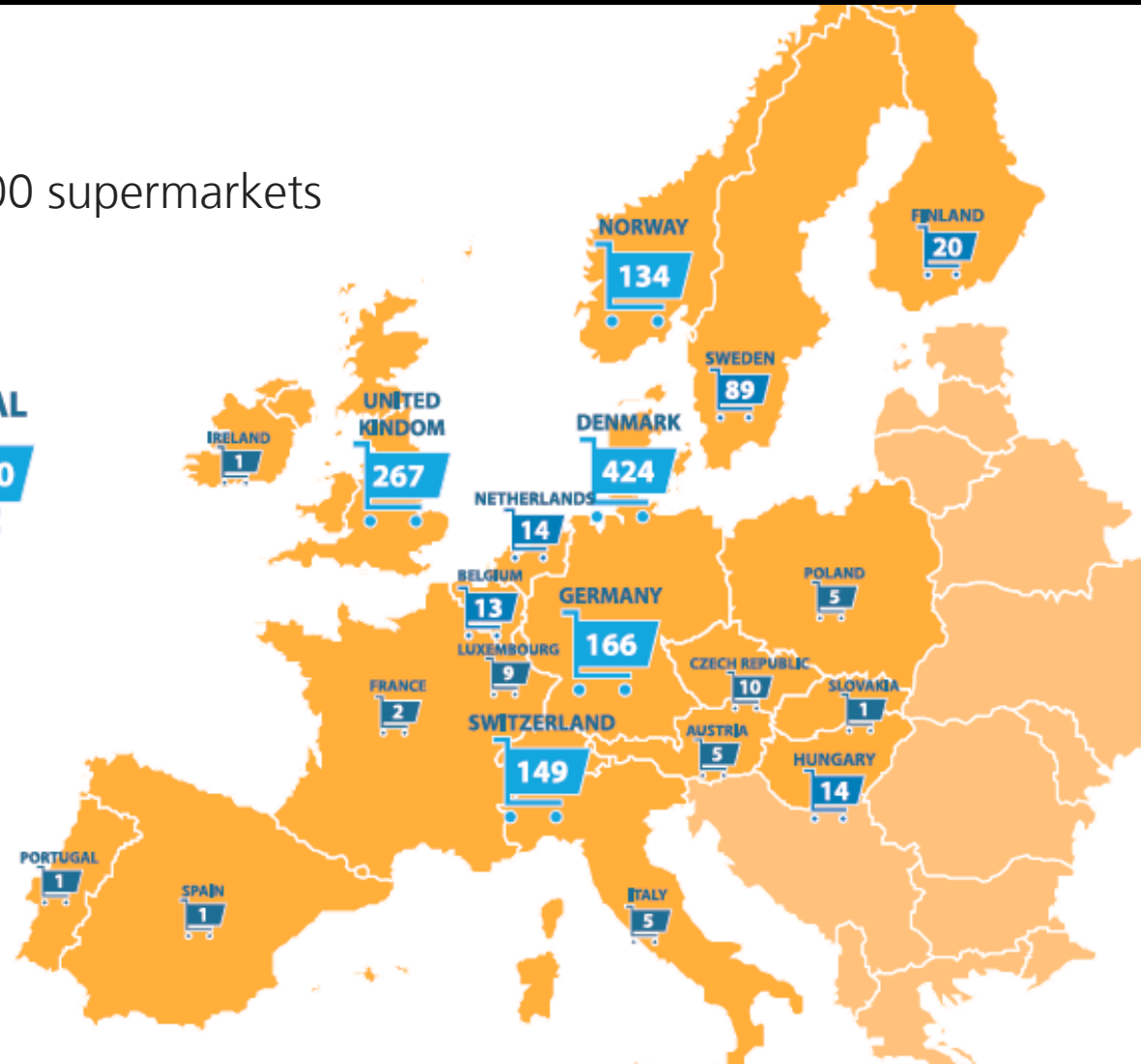
CO₂ TC supermarket map



Estimation: 1,000 - 1,500 supermarkets

Verified:

TOTAL
1330



Global Industry Survey about NR



- the **world's largest industry survey** to illustrate + quantify the market potential of natural working fluids
- about market state, trends & drivers, industry expectations, barriers & strengths, awareness levels etc.
- March to September 2011
- 6,500 invitations
- 1,254 replies included in the analysis

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

1. Personal Details

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 Autumn 2011.

WHY PARTICIPATE?

If your organisation is already active in Natural Refrigerants you will receive a FREE DIRECTORY ENTRY in the "guide". For all participants, we will share initial SURVEY RESULTS with you.

It will take you 10-15 minutes to fill 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. Organisation LOCATION - Continent:

Europe Oceania/Australia
 North America Asia
 South America Africa

2. Organisation LOCATION - Country:

3. Organisation SIZE (employees):

Small (1-99) Medium (100-499) Large (500+)

4. Organisation TYPE (please select all that apply):

End-User Consultancy / Marketing
 Manufacturer Training / Research
 Supplier Association
 Engineering / Contractor
 Other (please specify)

5. Field of ACTIVITY (please select all that apply):

Heating - Residential & Building Refrigeration - Industrial
 Heating - Industrial & Commercial Refrigeration - Transport
 Refrigeration - Domestic Air Conditioning - Stationary
 Refrigeration - Commercial Air Conditioning - Mobile
 Other (please specify)

6. Which ROUTES TO MARKET do you use for your products/services? (please select all that apply):

Direct Sales B2B Importer / Distributor
 Direct Sales B2C Specialist Wholesaler
 Tele-sales / Online Sales B2B General Wholesaler / Retailer
 Tele-sales / Online Sales B2C Installers / Contractors
 National Sales Offices None
 Other (please specify)

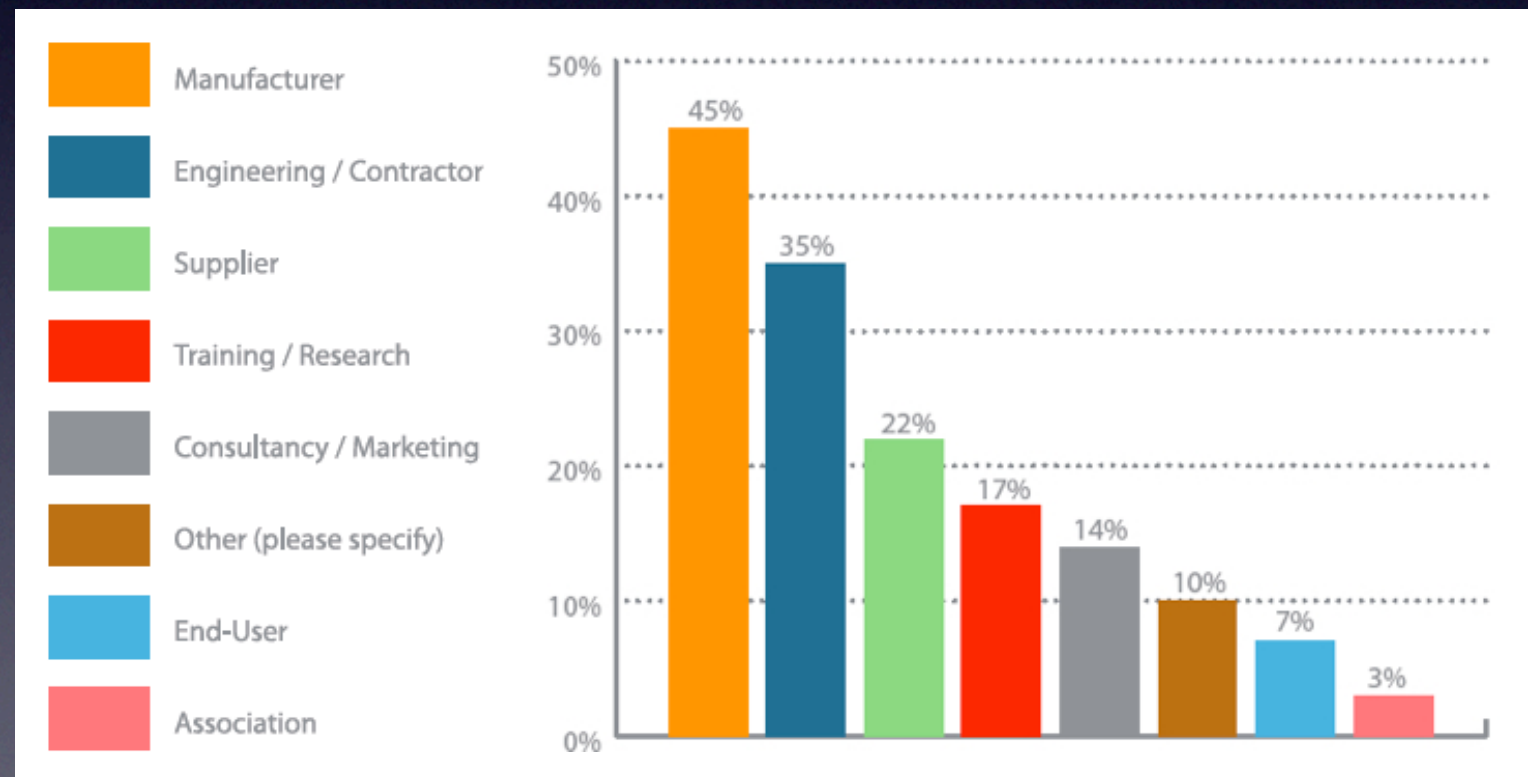
7. Legal Entity (please select all that apply):

Sole trader Partnership
 Limited liability company (LLC) Corporation
 Limited liability partnership (LLP) Government authority
 Other (please specify)

Organisation types



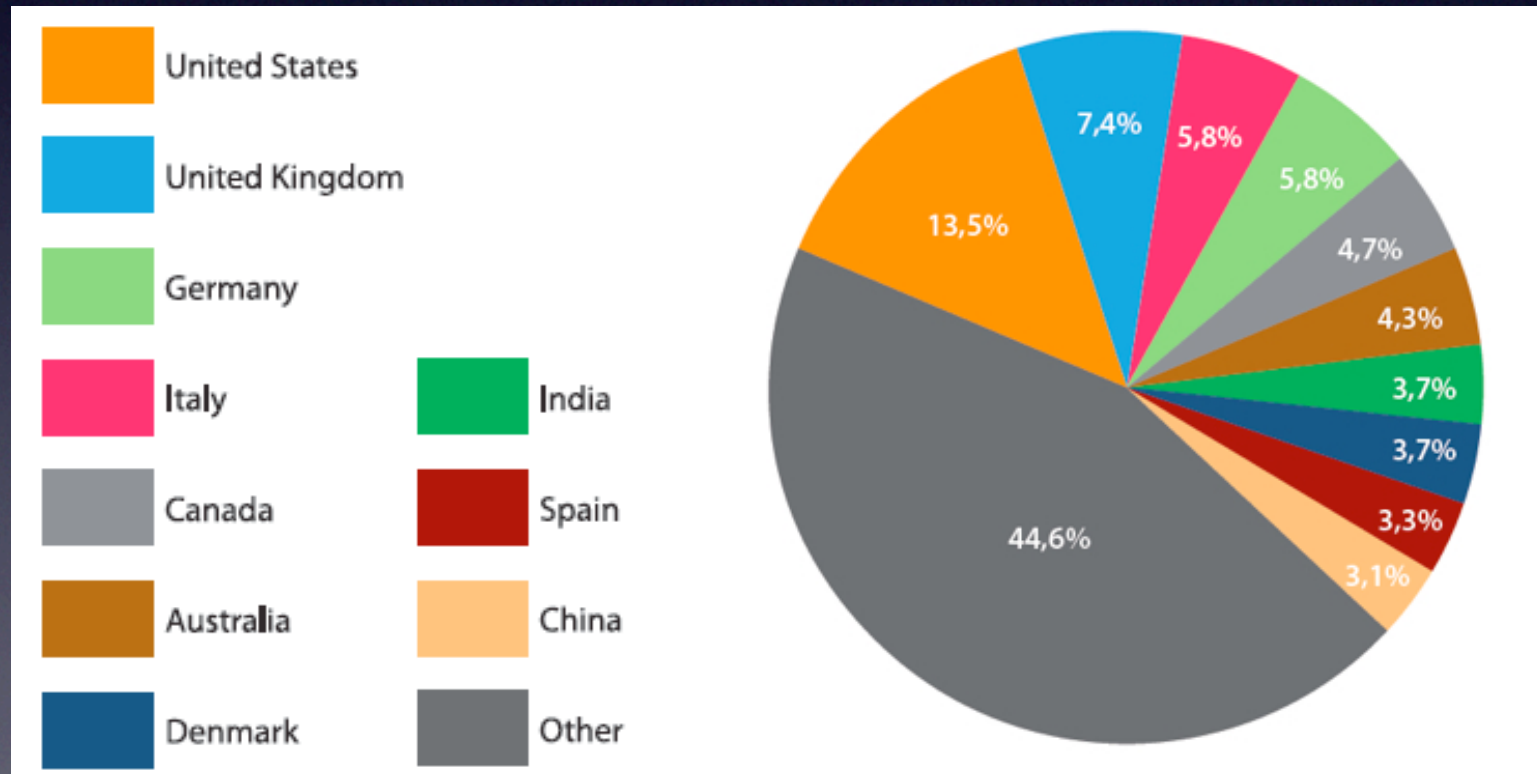
- manufacturers, engineering / contractors, and component suppliers leading response group



Geographic Location



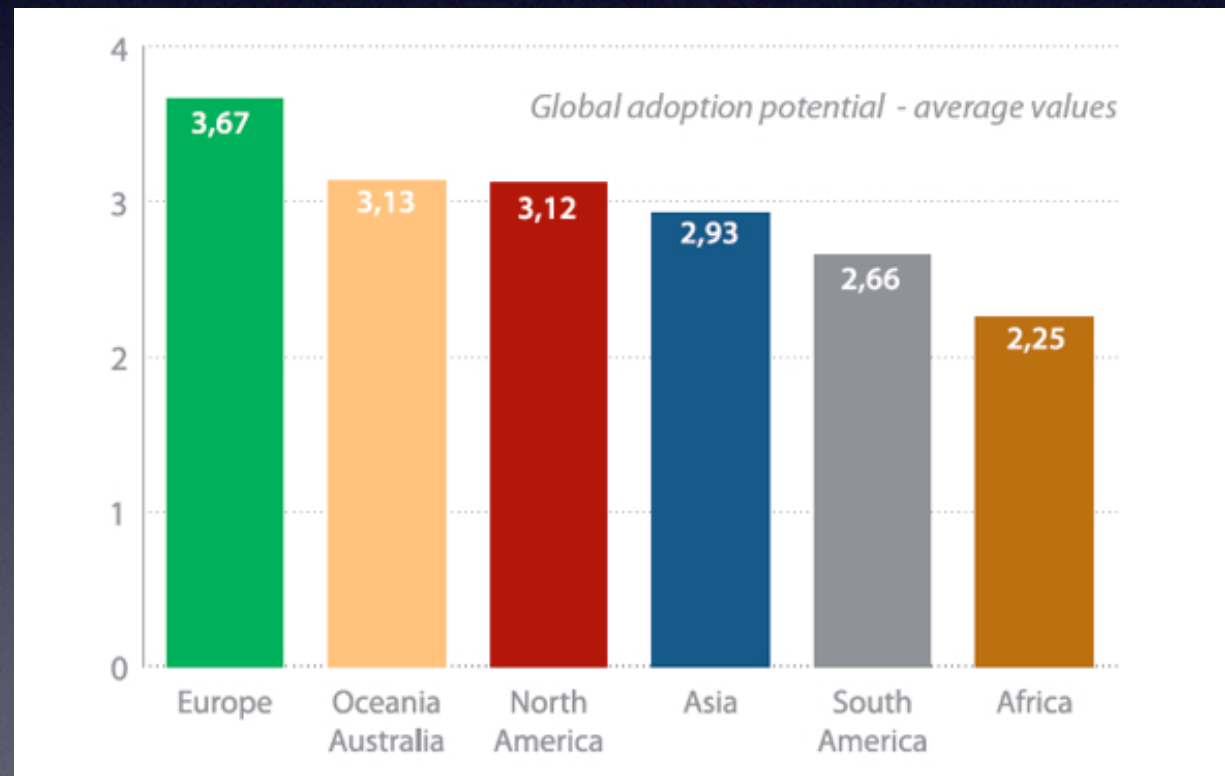
- 1,254 respondents from 92 countries
- most from the USA, UK, Germany, Italy, Canada, Australia, Denmark
- developing countries: India, China



Market Adoption Potential



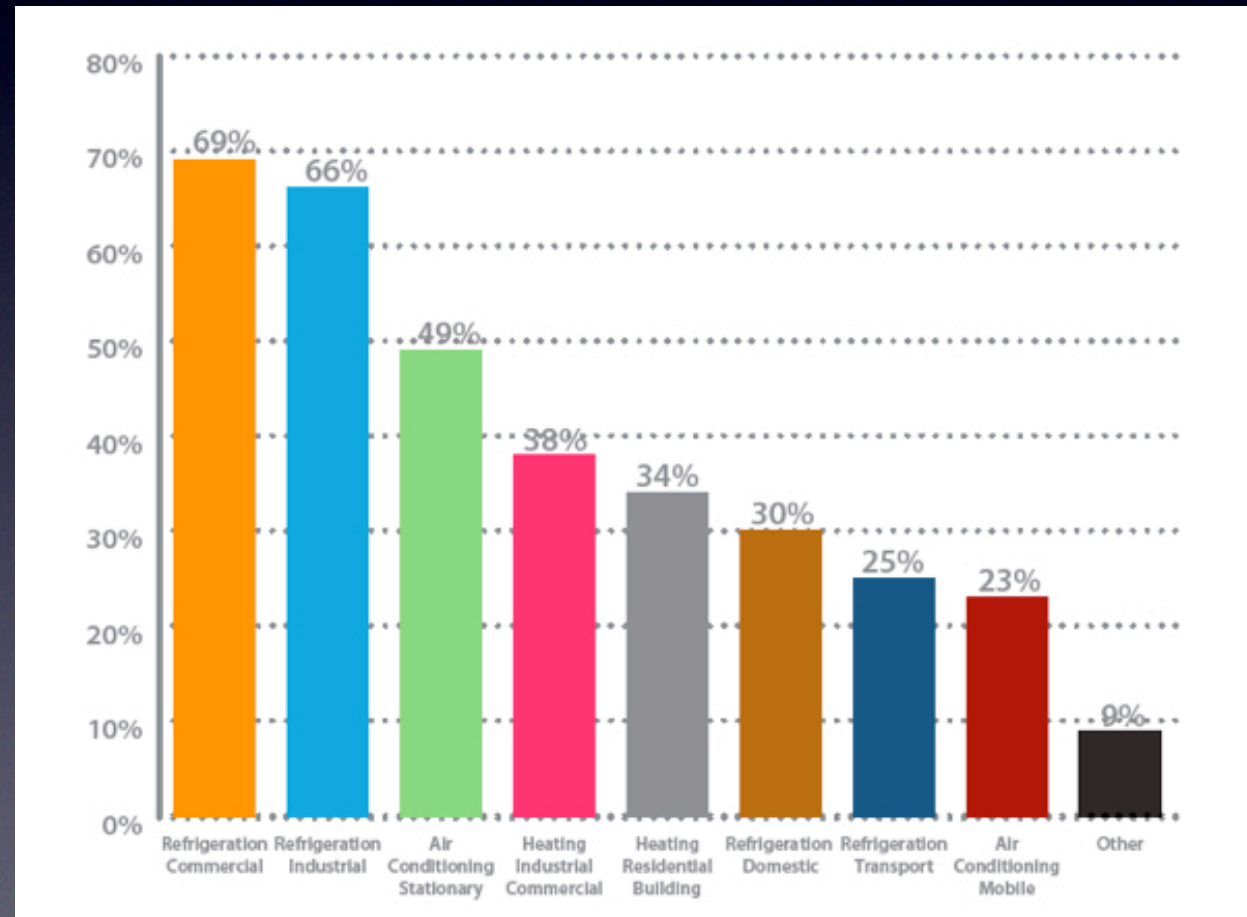
- Europe, by far, has the greatest immediate adoption potential for NR
- Australia / Oceania and North America still show a good potential
- Asia shows a good adoption potential (Middle East not extracted as sub-set)



Europe survey



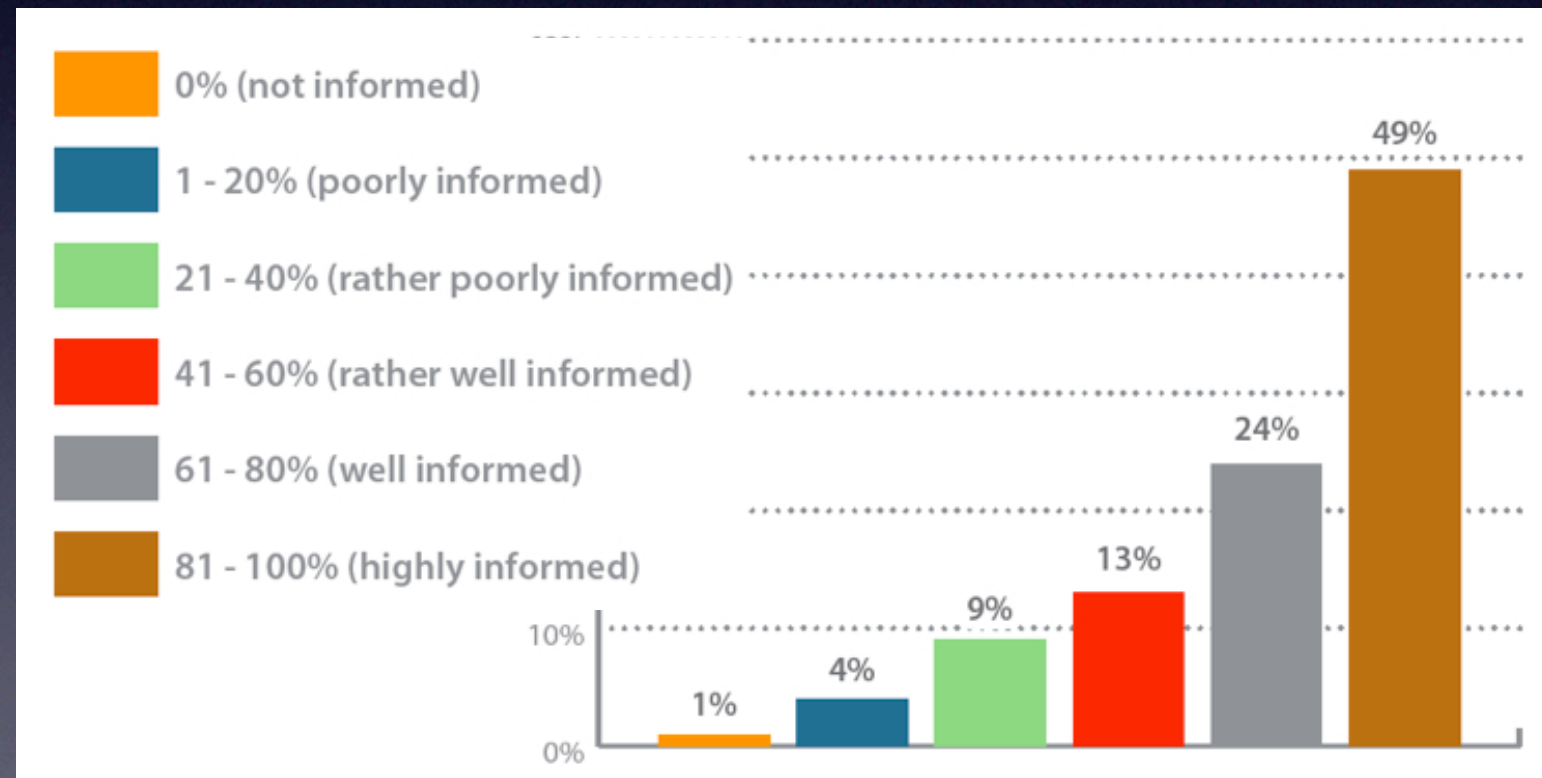
- 667 respondents from Europe, mostly from the commercial and industrial refrigeration sector



Awareness for NR: respondents



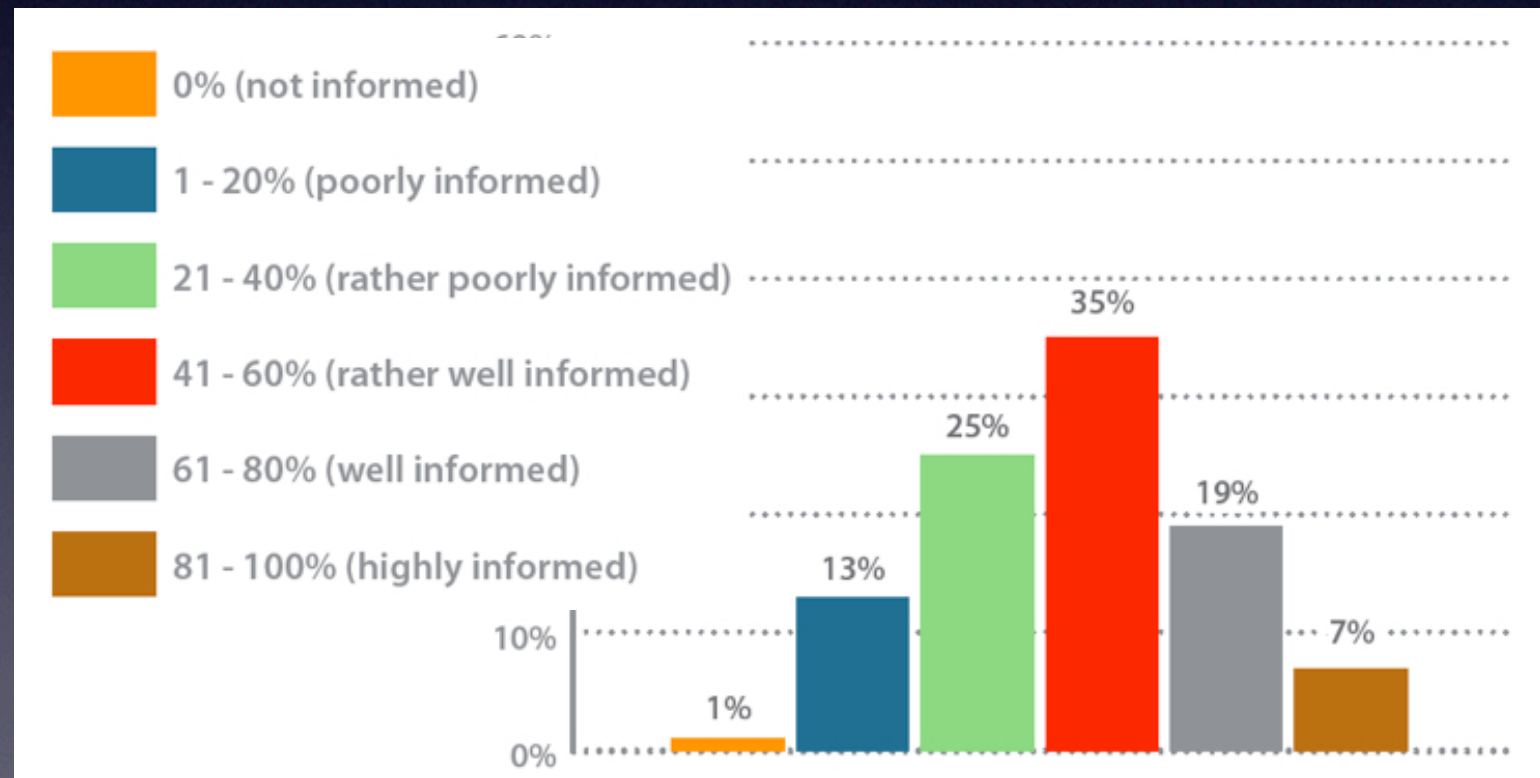
- high awareness levels for respondents - more than 70% are “highly informed” or “well informed”



Awareness - industry & customers



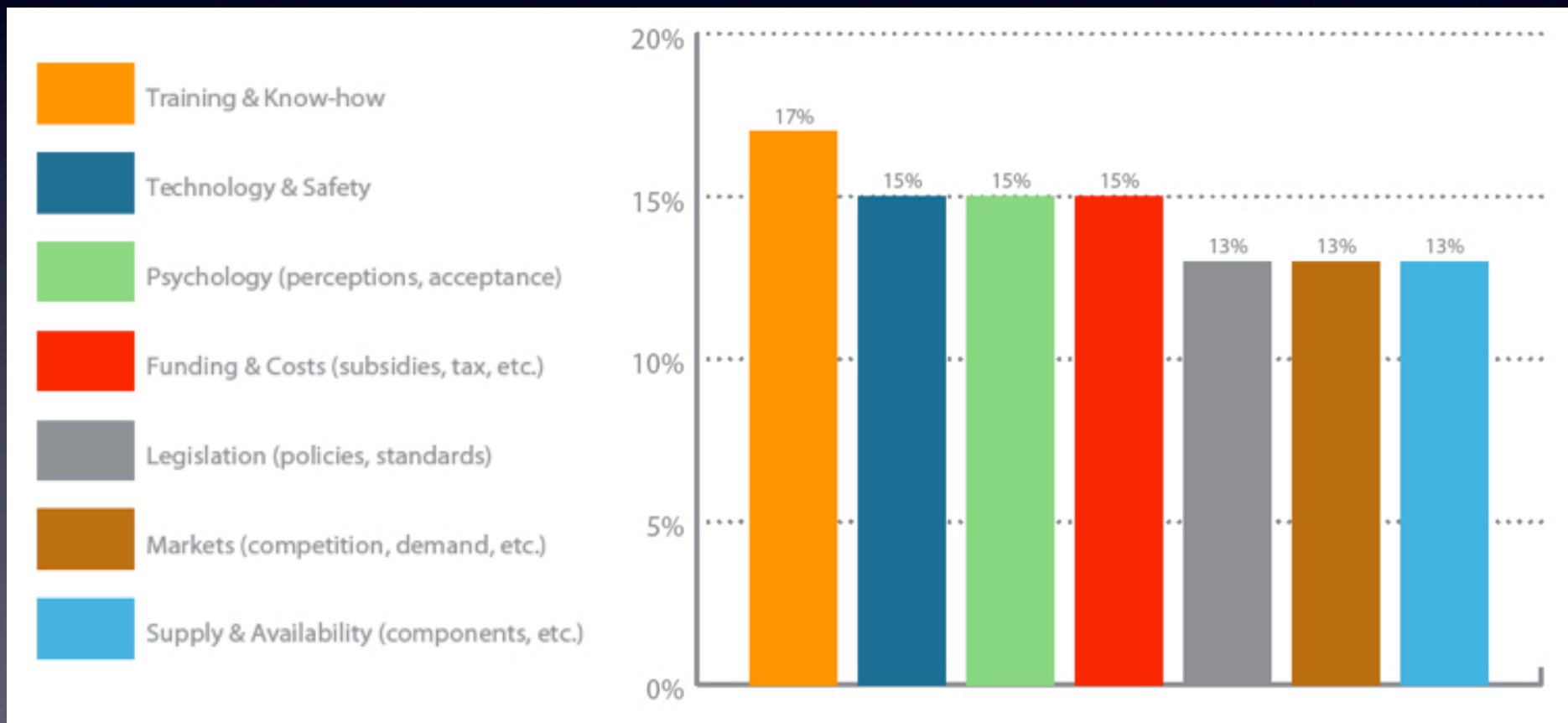
- low awareness levels for the HVAC&R industry overall and for their customers (39% say industry is “not informed” to “rather poorly informed”)
- conclusion: information exchange is key!



Barriers for NR



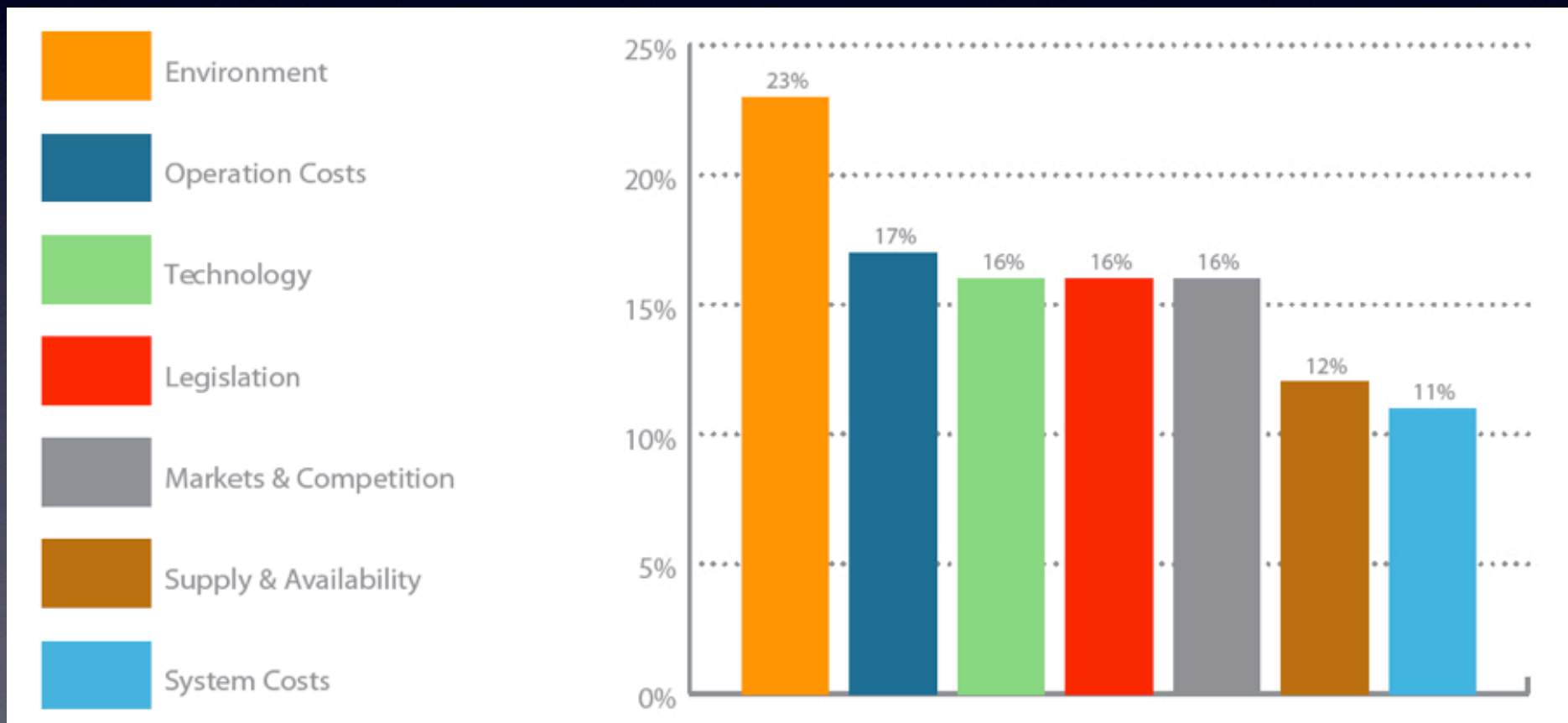
- 58% say training & know-how is a “strong” to “very strong” barrier
- technology & safety, psychology second and third strongest barrier



Strengths of NR



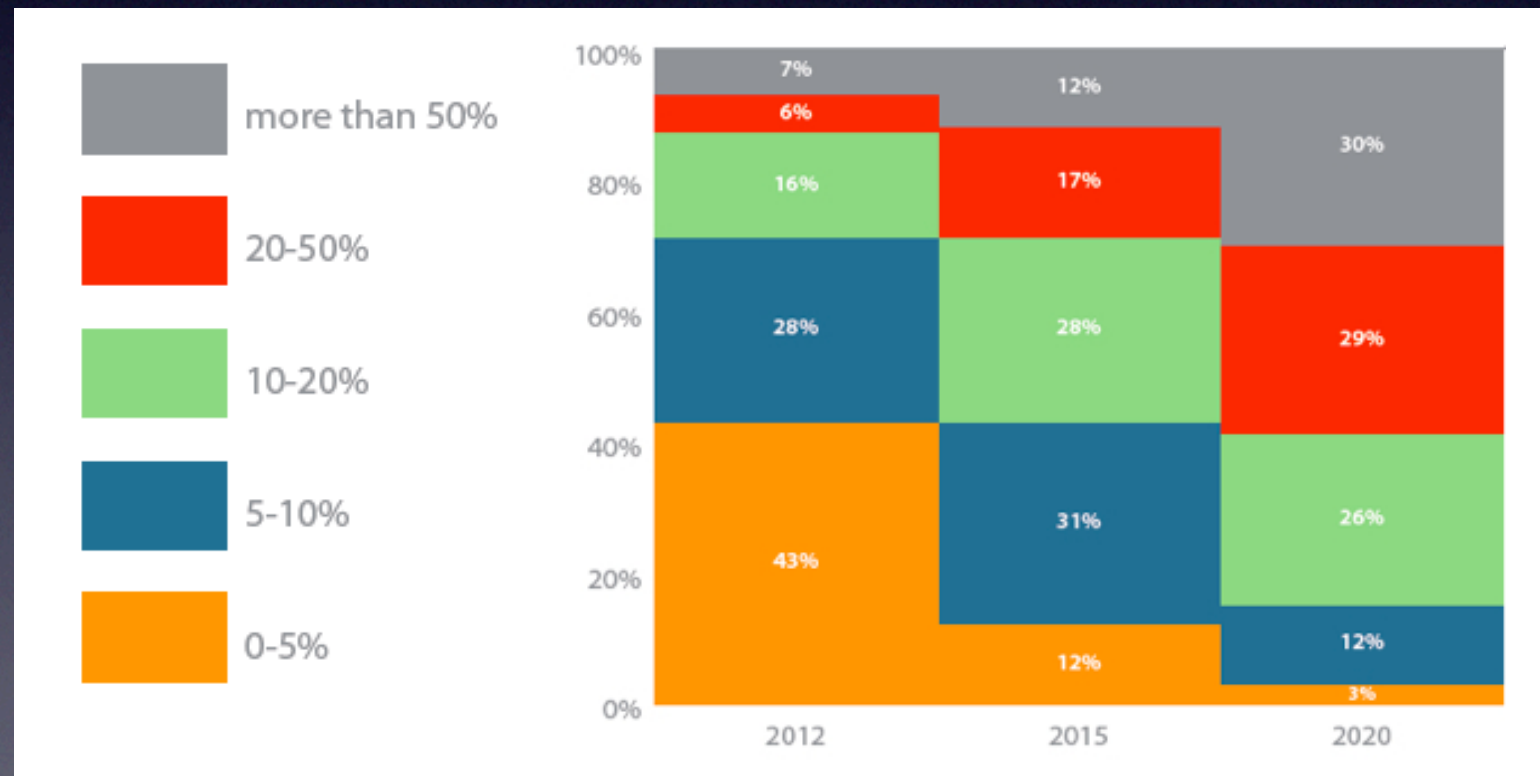
- 81% say environmental benefits, incl. direct and indirect emissions reductions + energy savings
- life cycle costs (operation, energy efficiency, maintenance) major benefit



Commercial refrigeration



- 30% of the NR industry hope for a “more than 50%” market share in commercial refrigeration by 2020
- only 3% believe the share will remain at “0-5%” (down from 43% today)



GUIDE - North America



- **Aims:** illustrate + quantify the market potential in NA
- market forecasts for the period 2012-2020 for NR by industry sector
- project the markets for hydrocarbons and carbon dioxide refrigerant in commercial and light-commercial refrigeration
- look at Willingness-to-Pay, policy & business climates, leadership potential of NA market
- **expected launch:** Autumn 2012

contact



<http://guide.shecco.com>

www.R744.com

www.ammonia21.com

www.hydrocarbons21.com

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